THE EPIDEMIOLOGY OF RISK BEHAVIOUR OF HIGH-SCHOOL STUDENTS IN THE CAPE PENINSULA, SOUTH AFRICA

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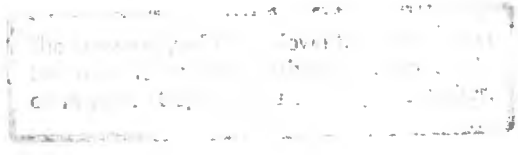

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ABSTRACT

Name: Alan John Flisher
Address: Department of Psychiatry, University of Cape Town, Private Bag, Rondebosch, 7700 Republic of South Africa
Title: The epidemiology of risk behaviour of high-school students in the Cape Peninsula, South Africa
Date: January, 1995

Objectives: To document: *(1)* the prevalence of selected risk behaviours of high-school students in the Cape Peninsula; *(2)* whether the notion of a *syndrome* of adolescent risk behaviour is valid for this setting, and to investigate whether suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome; and *(3)* the relationships among risk behaviours, taking into account their influence upon one another.

Design: The study was based on a cross-sectional survey utilising a self-completed questionnaire.

Sample: A stratified random sample of 7 340 students was selected from 16 schools in the three major education departments.

Results: High prevalences of risk behaviour were recorded; for example, 7,8% had tried to commit suicide in the previous year; 18,1% smoke cigarettes; 15,4% had engaged in binge drinking in the previous fortnight; 7,5% had ever smoked cannabis; 37,3% had failed to wear a seat belt on the last occasion this was possible; 9,8% of males had carried a knife to school and 25,0% had walked home alone at night in the previous month; and 17,4% had ever participated in sexual intercourse. With few exceptions, the unadjusted odds ratios for the relationships between pairs of these variables were significant. Between three and nine of 26 risk behaviours qualified for inclusion ($p < 0,01$) in each stepwise logistic regression model for each gender with each of the above risk behaviours as dependent variables. Cannabis smoking, alcohol bingeing, and exposure to danger in getting home at night were independently associated with having had sexual intercourse.

Conclusions: Intervention programmes are needed to reduce the prevalence of risk behaviours in this population. The notion of a syndrome of adolescent risk behaviour is valid for this population, and both suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome. There are significant relationships between many adolescent risk behaviours even when the influence of other risk behaviours is taken into account. The probability of adverse sequalae of risk behaviours such as exposure to danger in getting home at night and sexual intercourse is amplified by the presence of selected other risk behaviours.

SUMMARY

Objectives

Objective 1. To document the prevalence of selected risk behaviours of high-school students in the Cape Peninsula according to gender, school standard, and home language(s).

Objective 2. To ascertain whether the notion of a *syndrome* of adolescent risk behaviour is valid for this setting; and to investigate whether suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome.

Objective 3. To investigate the relationships among risk behaviours, taking into account their influence upon one another.

Design

The project was a cross-sectional survey utilising a self-completed questionnaire. In all analyses, estimates for each department were weighted to take account of the different proportions of students selected from each department.

Objective 1. Prevalence estimates are given with their 95% confidence intervals.

Objective 2. Relationships between risk behaviours are presented as unadjusted odds ratios, with their 95% confidence intervals, for each gender.

Objective 3. Stepwise logistic regression analyses were carried out for each gender.

Setting

High schools in the Cape Peninsula, South Africa.

Subjects

7 340 students from 16 schools in the three major education departments in the Cape Peninsula.

Outcome measures/variables

Objective 1. The risk behaviours were in the domains of suicidal behaviour, cigarette smoking, alcohol use, drug use, road-related behaviour, interpersonal violence, and sexual behaviour.

Objective 2. The following behaviours were included: alcohol bingeing, cannabis smoking, sexual intercourse, knife-carrying at school, cigarette smoking, attempting suicide, failure to use a seat belt, and walking home at night from beyond the neighbourhood.

Objective 3. The behaviours included for Objective 2 constituted the dependent variables for each model for each gender, and the independent variables comprised 26 other risk behaviours.

Results

Objective 1. *Suicidal behaviour.* During the previous 12 months, 19,0% of the students had seriously thought about harming themselves n a way which might result in their death; 12,4% had told someone they intended to put an end to their life; and 7,8% had actually tried to put an end to their life.

Cigarette smoking. Of all the students, 18,1% indicated that they smoked at least one cigarette per day, of whom 66,9% had tried to stop. Of those who did not smoke at least one cigarette per day, 41,2% had smoked previously and 3,6% intended to start smoking.

Alcohol use. Of the sample, 53,2% reported having ever used alcohol; 26,2% had used it in the previous seven days; and 15,4% reported episodes of binge drinking in the previous 14 days.

Drug use. Cannabis was the illicit drug most widely used; 7,5% had smoked it, and 2,4% had done so in the previous seven days. A small subgroup (1,6%) had smoked cannabis and methaqualone (Mandrax) together. Reported lifetime use of injectable drugs was 0,5% and 10,9% had ever sniffed solvents, 2,6% having done so in the previous seven days.

Road-related behaviour. During the previous year, 8,5% of the students had been involved in a motor vehicle accident, and 7,4% had been injured in a pedestrian accident. Of those who had driven a vehicle, in the previous year, 63,2% reported driving without a license; 16,1% drove an overcrowded vehicle; and 8% reported driving under the influence of alcohol or cannabis. Of those who had been on a motorcycle, 47,9% reported riding without a helmet in the previous year. Despite the availability of seat belts, in the previous 12 months, 37,3% had failed to wear one on the last occasion they were in the front seat of a vehicle.

Interpersonal violence. In the previous year, 12,7%, 9,6%, and 13,8% reported that they had been physically injured by another person at school, at home, and in other settings respectively; 11,0% had injured another pupil at school and 11,7% had injured someone outside of home or school; 5,0% had committed an act of vandalism at school and 5,4% had done so outside of school or home. In the previous four weeks, 9,8% of males and 1,3% of females had carried a knife to school to be used as a weapon. In the previous month, 17,3% reported going out at night beyond their neighbourhood without knowing how they were going to get home; 25,0% had walked home alone; and 7,1% had hitchhiked home.

Sexual behaviour. The questions involving sexual behaviour were answered by 79,7% of the sample, of whom 17,4% indicated a previous episode of sexual intercourse. The median age at first intercourse was 15,1 years and the median number of partners in the previous 12 months was 1,0. The median number of weeks since the most recent coital

episode was 6,6; on that occasion, 76,6% had known their partner for more than seven days, while 60,5% had done something to prevent pregnancy. The most frequently used method of contraception was injectable steroids for Xhosa-speaking students and condoms for the other students.

Trends according to gender, school standard, and language group. Except for suicidal behaviour, there was a tendency for males to be more at risk than females. With the exceptions of sexual behaviour and (for boys) substance abuse, there was a trend for Xhosa-speaking students (and especially female Xhosa-speaking students) to be less likely to engage in risk behaviour.

Objective 2. All the odds ratios were greater than 1. There were statistically significant odds ratios between all the pairs of risk behaviours included in the "original" syndrome of risk behaviour, except for cigarette smoking and having had sexual intercourse for girls. There were statistically significant relationships between all these risk behaviours, suicidal behaviour, and the behaviours exposing oneself to risk of physical injury, except for failure to use a seat belt and: *(i)* suicidal behaviour for both genders; and *(ii)* walking home alone at night and having had sexual intercourse for girls.

Objective 2. For each model, between three and nine variables qualified for inclusion for each gender. There was a substantial association between many forms of substance abuse. In the previous 12 months, suicidal thoughts or communicating suicidal intent were predictors of a suicide attempt. Several variables involving injury were predictors of exposure to danger in getting home at night, and this was a predictor of substance abuse. Cannabis smoking, alcohol bingeing, and exposure to danger in getting home at night were predictors of and predicted by having had sexual intercourse.

Discussion

Objective 1. A substantial proportion of high-school students are at risk for adverse consequences of various risk behaviours. There is an urgent need for prevention programmes to address this situation. These programmes would benefit from a better understanding of the factors protecting Xhosa-speaking students from engaging in many of the risk behaviours.

Objective 2. The notion of a syndrome of adolescent risk behaviour is valid for this population, and both suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome. This provides support for a lifestyles approach to adolescent risk behaviour.

Objective 3. There are significant relationships between many adolescent risk behaviours even when the influence of other risk behaviours is taken into account. The probability of adverse sequalae of risk behaviours such as exposure to danger in getting home at night and sexual intercourse is amplified by the presence of selected other risk behaviours.

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Chapter 1

Chapter 1

INTRODUCTION

The term *risk behaviour* is derived from the epidemiological concept of *risk factor*, which is defined as a factor whose presence is associated with an increased probability that disease will develop at a later stage (Mausner and Kramer, 1985). Much epidemiological effort has been devoted to identifying the demographic, biological, and environmental risk factors for disease (Rothman, 1986). However, in recent times the focus has broadened to include aspects of the *social environment* and *behaviour* as risk factors for disease (Winett *et al.*, 1989).

The latter aspect has resulted in the development of the sub-discipline of *behavioural epidemiology*, the growth of which has been facilitated by the increasing recognition of the contribution of behaviour to morbidity and mortality. In South Africa, chronic diseases of lifestyle were responsible for 24,5% of deaths of all South Africans in 1988 (Steyn *et al.*, 1992), and violence and trauma accounted for a further 16,6% (Parry and Yach, 1993). These figures give an underestimate of the impact of behaviour on mortality because *(i)* the AIDS epidemic had at that stage not exerted a significant impact on South African mortality data and; *(ii)* they overlook the non-fatal deleterious consequences of destructive lifestyles (Winett et al., 1989).

In addition to the concept of risk factors having been broadened to include, *inter alia*, behavioural factors, the range of possible outcomes upon which risk factors can impact has been broadened to include aspects other than biomedical pathology. Thus, while the use of cannabis is a risk factor for the development of pulmonary pathology (Gong *et al.*, 1987; Morris, 1985), it can also serve as a risk factor for various adverse *psychosocial* outcomes such as conflict with parents, poor scholastic progress, or legal sanction (Jessor, 1991). As Jessor (1991, p 599) states:

> *Risk behaviors can jeopardize the accomplishment of normal developmental tasks, the fulfillment of expected social roles, the acquisition of essential skills, the achievement of a sense of adequacy and competence, and the appropriate preparation for transition to the next stage in the life trajectory, young adulthood. The term* risk behavior *refers, then, to any behavior that can compromise these psychosocial aspects of successful adolescent development. Substance abuse, withdrawal from school involvement, unprotected sexual intercourse, driving after drinking, and engaging in violence are some obvious examples.*

Adolescent risk behaviour has in recent times been enjoying increasing research attention from psychiatrists and other mental health professionals (Compas *et al.*, 1995; Levitt *et al.*, 1991). Some specific reasons for this are as follows.

- Young people constitute a significant proportion of the population. In Africa in 1990, people under the age of 25 years constituted 64% of the population (United Nations, 1988). Of more relevance to this thesis is the proportion of the South

African population that are adolescents. Using the definition of adolescence adopted by the World Health Organisation, *viz.* all people between the ages of 10 and 19 years (Friedman, 1989), it is estimated that the 7.75 million adolescents in South Africa in 1990 constituted 22% of the total population (Mostert and Van Tonder, 1987). Furthermore, there are data indicating that the proportion of young people in the world population has been increasing. Between 1960 and 1980, the total population of the world increased by 46%. However, the number of young people between the ages of 15 and 24 years increased by 66% (WHO, 1993a).

- The life styles of adolescents involve a greater degree of exploration, experimentation, and rebellion than those of other age groups (Busen, 1991; Lavery and Siegel, 1993; Moore and Rosenthal, 1993). The potential for risk taking behaviour is thus greater (WHO, 1986). Risk behaviour is frequently adopted to define a social image or achieve social status, and it can thus fulfill important developmental functions (Hurrelmann, 1990; Jessor, 1989). The effects of certain adolescent behaviour (for example, unsafe sexual practices) may only become manifest after adolescence (King *et al.,* 1989).

- Adolescence is a critical period for the acquisition of health promoting behaviour and attitudes since adolescents are particularly influenced by social factors as they attempt to develop a sense of identity (Erikson, 1956). Preventative activities during adolescence are likely to have maximal impact in that their effects are multiplied by their persisting throughout adulthood (Sachdev, 1990; Seager, 1990; Winett *et al.*, 1989).

- Adolescents are at high risk for the adverse consequences of urbanisation. There are two reasons for this.

    a) They are more likely to have migrated from rural to urban areas than others (WHO, 1993a). In South Africa, 20% of black youth (equivalent to 1,5 million people) live in shacks, the overwhelming majority of which are situated in urban or peri-urban conurbations (Everatt and Orkin, 1991). However, a mere 2% of black young people were born in these informal settlements! (Everatt and Orkin, 1991)

    b) Urbanisation can impede the negotiation of the diverse developmental tasks associated with adolescence (WHO, 1977). These tasks include: adaptation to physical changes; resolving earlier forms of attachment to parents and other family members; and developing through peer relationships an enhanced capacity for personal intimacy (Freeman, 1993; WHO, 1986). The successful negotiation of these tasks is facilitated by living circumstances characterised by *stability*. Clearly, this is not a feature of migration between rural and urban communities nor of residence in a peri-urban informal settlement. Stability is threatened by separation from the support system provided by extended families, housing difficulties, crime, unemployment, poverty and political violence and uncertainty (Friedman, 1985). Also, the ability of adults to serve as stable role models is impeded by

their frequently having grown up in circumstances very different to that to which their children are exposed (Friedman, 1989).

- Finally, increasing numbers of adolescents attend school. It has been estimated that by the year 2020 there will be between 14 and 17 million young people enrolled at schools in South Africa (Dostal, 1990). This implies the potential for efficient health promotion efforts at schools (Bartlett, 1981).

As an initial step in designing effective interventions, comprehensive studies in which estimates of the prevalence of a wide range of adolescent risk taking behaviours are required. Studies in Australia (Finlayson *et al.*, 1987), Canada (King and Coles, 1992), Europe (Nutbeam *et al.*, 1989), and the United States of America (American School Health Association *et al.*, 1989; Kolbe *et al.*, 1993) have addressed this need. However, South African studies have tended to emphasise specific behaviours and have been based on small, non-representative samples (Yach, 1993a). Furthermore, the interrelationships between different risk behaviours have not been examined.

The **aim** of the study reported in this thesis was to describe selected aspects of the epidemiology of risk behaviour of high-school students in the Cape Peninsula, South Africa.

The following domains of risk behaviour were included:

- suicidal behaviour
- cigarette smoking;

- drug use;
- alcohol use;
- road-related behaviour;
- violent behaviour; and
- sexual behaviour.

There is both a *descriptive* and an *analytic* component to the project (Yach and Botha, 1986). The former aspect addresses the prevalence of various risk behaviours in terms of school standard and home language(s), and gender. The latter aspect is concerned with the interrelationships between these behaviours, which are documented using both bivariate and multivariate statistical techniques. Multivariate techniques were required to investigate whether significant bivariate relationships are preserved once the influence of other risk behaviours is taken into account.

Chapter 2

Chapter 2

LITERATURE REVIEW

There are literally thousands of international reports involving each of the risk behaviours included in the study described in this thesis. It would obviously be impossible to review this entire body of literature. This gives rise to a dilemma between going into some detail for selected international projects and, on the other hand, reviewing a large number of reports in a superficial manner. I have opted for the former course. Two comprehensive international studies will be described in some detail, one carried in 17 European countries and Canada (King and Coles, 1992) and the other in the United States of America (USA) (Kann *et al.*, 1993).

This review will commence with an account of each of these studies. Prevalence data will not be presented at this stage. Thereafter, each category of risk behaviour of interest will be explored in terms of the adverse outcomes with which it is associated and the prevalence of selected risk behaviours comprising that category. The adverse outcomes will imply a rationale for the inclusion of each risk behaviour. The prevalence data will include international findings, and it is in this section that some specific findings from the two international studies mentioned above will be included. Finally, after each of the categories of risk behaviour have been discussed, the literature regarding the interrelationships between risk behaviours will be reviewed.

2.1 INTERNATIONAL SURVEYS OF ADOLESCENT RISK BEHAVIOUR

The two international studies that will be described in some detail are: *(i)* the WHO Cross-National Study Health Behaviour Among School-Aged Children (HBSC) Study carried out in 1989-1990 in 17 European countries and Canada (Anonymous, 1994); and *(ii)* the Youth Risk Behavior Survey (YRBS) carried out in the United States in 1991 (Kolbe *et al.*, 1993). These particular studies were selected for the following reasons.

- They are comprehensive in that they include a range of risk behaviours.

- There are several aspects of their methodology that correspond to the methodology of the study described in this thesis, including the fact that a self-completed questionnaire was administered in the classroom context.

- The methodology is of high quality, especially in terms of sample size, measures taken to ensure anonymity, and data analytic strategy.

- Data collection took place at approximately the same time as the data collection for the study reported in this thesis. This removes one possible source of variation between the findings for the study described in this thesis and previous international work.

2.1.1 The Health Behaviour Among School-Aged Children (HBSC) Study

The HBSC Study represents a programme of research which has sought to develop common definitions and survey instruments for measuring a range of adolescent health-related behaviours in the context of relevant social and environmental variables (Smith *et al.*, 1992). The aims of gathering these data are as follows (Research Centre for Health Promotion, University of Bergen, 1994; Smith *et al.*, 1992): *(i)* increasing the understanding of health behaviours, lifestyles, and their context in young people; *(ii)* increasing the understanding of how young people themselves perceive health; *(iii)* developing national information systems on health and lifestyles among young people; *(iv)* facilitating the development of expertise by cross-disciplinary groups of researchers in participating countries; and *(v)* promoting international networking between those working in the field.

Shortly after its initiation, the project was adopted by the World Health Organisation (WHO) as a WHO Collaborative Study (Aarø *et al.*, 1986). Four countries (Austria, England, Finland, and Norway) participated in the first survey in 1983-1984 and 14 countries in the second survey in 1985-1986. Selected results from the third survey, carried out in 1989-1990, are presented in this thesis when individual risk behaviours are discussed. Twelve countries participated in this survey, *viz.* Austria, Belgium, Canada, Finland, Hungary, Norway, Poland, Scotland, Spain, Sweden, Switzerland, and Wales, and another five (Australia, Denmark, Latvia, the Netherlands, and Northern Ireland) completed it after schedule (Research Centre for Health Promotion, University of Bergen, 1994). However, data are available from 11 countries only, and it is these countries for which prevalence data are provided below (King and Coles, 1992). There were

26 countries and regions involved in the 1993-1994 survey, but there are no results available yet from this wave of data collection. It is suggested that participating countries carry out surveys every fourth year (Research Centre for Health Promotion, University of Bergen, 1994).

Three age groups are included in the study, with a mean ages of 11,5, 13,5, and 15,5 years. Students are sampled by clusters defined by schools and/or school classes. With a few exceptions, the participating countries were able to obtain representative countrywide samples. Data collection was through self-completed questionnaire and took place in the classroom. The personnel who administered the questionnaire varied from country to country; they included teachers, school nurses, and research assistants. (Nutbeam *et al.*, 1991; Piette *et al.*, 1993; Smith *et al.*, 1993).

The questionnaires included both core questions and optional questions. The former were asked by each participating country while the latter were included at the discretion of each participating country. Cigarette smoking, and alcohol and drug use (from the core questions) and sexual behaviour (from the optional questions) are directly relevant to this thesis.

A sample size of 1 500 per country per age group was recommended. However, not all participating countries achieved this target as can be seen from Table 2.1 which provides the gross and net sample sizes of those countries participating in the 1989-1990 survey for which data are available. These data are provided to place the prevalence data that are presented in the sections below in context.

Table 2.1 *Gross and net sample sizes of the countries participating in the 1989-1990 HBSC Study for which data are available (King and Coles, 1992)*

Country	Gross sample size	Net sample size
Austria	3 192	2 984
Belgium	3 022	3 007
Canada	7 633	5 565
Finland	3 046	2 996
Hungary	8 023	6 498
Norway	5 111	5 037
Poland	4 643	4 613
Scotland	4 079	3 934
Spain	4 393	3 372
Sweden	3 631	3 553
Wales	6 977	6 724

2.1.2 The Youth Risk Behavior Survey (YRBS)

The YRBS was initiated by the Centers for Disease Control in the USA in response to a review of the leading causes of morbidity and mortality among youth and adults (Kolbe *et al.*, 1993). It was concluded that six categories of behaviour contribute to these leading causes: behaviours that contribute to unintentional and intentional injuries; tobacco use; alcohol and other drug use; sexual behaviours that contribute to unintentional pregnancy and sexually transmitted infections; unhealthy dietary behaviours; and physical inactivity (Kann *et al.*, 1995). Data obtained from the YRBS are used primarily for the following two purposes (Kolbe *et al.*, 1993): *(i)* monitoring progress in achieving various national objectives, for example 26 of the national health objectives for the year 2000; and *(ii)* supporting state and local policies and intervention efforts to reduce risk behaviour among adolescents. There is thus a difference of emphasis in terms of the purpose of the surveys comprising the HBSC Study and the YRBS.

There are three components to the YRBS: national household-based surveys; state and local school-based surveys; and national school-based surveys. At the time of writing, three national surveys have been conducted: in 1990, 1991, and 1993. It is intended to conduct the survey biennially during the odd-numbered years until the turn of the century among national probability samples of students in grades 9 to 12 from public and private schools. As for the HBSC Study, the questionnaire is administered in a classroom context by teachers, school nurses and others.

Even though more recent data are available (Kann *et al.*, 1995), selected results of the 1991 national survey will be reported below, to minimise the

periods of time between the YRBS and the survey carried out in the Cape Peninsula described in this thesis. The demographic characteristics of the students comprising this sample are provided in Table 2.2.

Table 2.2 Demographic characteristics of the sample for the 1991 Youth Risk Behavior Survey (Kann et al., *1993)*

	Number	%
Gender:		
• male	5 984	51,1
• female	6 283	48,9
Grade:		
• 9	3 055	24,9
• 10	3 120	25,4
• 11	2 867	23,4
• 12	3 209	26,2
• Missing	21	-
Race or ethnicity:		
• White	5 385	70,0
• Black	2 822	14,3
• Hispanic	3 185	8,8
• Other	857	6,9
• Missing	23	-
Total	12 272	100

2.2 CATEGORIES OF RISK BEHAVIOUR

After a brief introduction for each category of risk behaviour, the review for each category of risk behaviour will have the following sections.

a) Adverse outcomes

The adverse psychological, physical, and social outcomes for which each risk behaviour is a risk factor will be discussed. Where appropriate, both short-term and long-term outcomes will be included.

Although crucial conclusions based on international research will not be overlooked, *the focus will be on adverse outcomes revealed or supported by South African studies.* This section of the review will not be very extensive since the amount of South African work is in most cases not extensive and the adverse outcomes of the risk behaviours do not comprise the main aspect of the thesis. The principle intention of describing the adverse effects is to provide a rationale for including each form of risk behaviour.

b) International prevalence studies

Relevant results of the key international studies mentioned in Section 2.1 above will be provided. However, there are several areas of risk behaviour not included in these studies. For these areas, the review will be broadened to include

other methodologically sound international studies (American School Health Association *et al.*, 1989; King *et al.*, 1988, 1989). International studies involving unrepresentative subgroups in the countries concerned will not be included.

This section will conclude with a summary of the key prevalence trends as revealed by these international studies. In addition to overall prevalence, the trends according to gender, school standard, and race/ethnicity will be explicated. These categories have been selected since they correspond to the categories according to which the results of the present study will be presented.

There will be *no* attempt to explain any of the trends that are mentioned; this will be done in the following section in which South African prevalence studies are described.

c) South African prevalence studies

Finally, the results of prevalence studies of risk behaviour of South African adolescents will be presented. An attempt was made to include all relevant South African studies. Besides studies involving school students, other studies with samples consisting predominantly of adolescents (for example, military recruits and university undergraduates) are reported.

As for the international studies, the trends according to gender, school standard, and population group will be extracted. Where applicable, any differences between the South African scenario and that in the USA, Europe, and Canada will receive attention.

An attempt will be made to account for some of the trends that emerge from both the South African and international data.

It will become clear that for each of the risk behaviours included there is a dearth of South African studies that are:

- recent;
- methodologically adequate;
- have samples of school students; and
- have representative samples in the sense that they are not confined to demographic subgroups.

In this context, the present study fills an important gap in the literature.

2.2.1 Suicidal behaviour

The Chinese ideogram for "crisis" has two characters, one denoting "danger" and the other "opportunity" (Golan, 1978). The *danger* inherent in suicidal behaviour is obvious; not only is the potential of a young life suddenly destroyed by a "successful" suicide attempt, but it can leave in its wake feelings of grief, guilt, and anger on the part of family and friends (WHO, 1993a). The *opportunity* associated with suicidal behaviour stems from the possibility that a suicide attempt (or the planning thereof) can draw attention to previously unrecognized misery or psychopathology, for which intervention may be successful (Saunders *et al.*, 1994) . This review will commence with the former aspect.

a) Adverse outcomes

Fatal suicide attempts

The most obvious and catastrophic outcome of suicidal ideation and behaviour is death by suicide. The validity of suicide statistics are impaired by inadequacies in the data collection process, selective underreporting because of stigma, and a failure to identify suicidal motives for a proportion of deaths ascribed to other causes such as motor vehicle accidents (Blumenthal, 1988; Botha and Bradshaw, 1985; Bradshaw *et al.*, 1987; Central Statistical Services, 1986; Flisher *et al.*, 1992; Flisher and Parry, 1994; Kielkowsky *et al.*, 1989; Van der Merwe *et al.*, 1991; WHO, 1993a, 1986). Despite this, there is consensus that completed suicide in adolescence is a relatively rare event (Shaffer *et al.*, 1988). For the age group 5 - 14 years, the suicide rate per 100 000 was 0,7 in

the USA and 0,8 in the UK in 1989 (Shaffer and Piacentini, 1994). The corresponding figures for the age group 15 to 19 years were 13,2 in the USA and 7,6 in the UK (Shaffer and Piacentini, 1994).

There is only one analysis of South African mortality data in which the mortality due to suicide in South African adolescents is examined (Flisher *et al.*, 1992). This study examined all external causes of death in South African adolescents, and used the most recent three-year period for which data are available, *viz.* 1984-1986. Mortality rates were not provided for blacks owing to poor data quality; however, the suicide external cause proportional mortality for blacks is similar to Coloureds (Flisher *et al.*, 1992). The results of the study that are relevant for suicide are presented in Table 2.3. For whites and Asians aged 15 to 19 years, the rates are intermediate between those in the USA and the UK, while those for Coloureds are less than in these countries.

Table 2.3. Annual mortality rates per 100 000 for adolescents in South Africa for each population group, 1984-1986 (Flisher et al., *1992).*

	Age group	
Population group	10 to 14 years	15 - 19 years
Whites (N = 1 446)	2,1	11,4
Coloureds (N = 1 817)	0,8	3,4
Asians (N = 287)	1,3	12,5

Despite these low incidence rates, the topic of adolescent suicide has aroused considerable academic, clinical, and popular interest in recent years (WHO, 1993a). Among the principal reasons for this are the following.

- Although the suicide mortality rate is low, the rank order of suicide in the causes of death for adolescents is generally high. In most countries, suicide ranks only after accidents as cause of death in adolescents (WHO, 1990).

- Death from suicide can be psychologically calamitous for the relatives and friends of the person who has died (Rudestam and Imbroll, 1983). These "survivors" of suicide are at increased risk for complicated bereavement and may experience guilt at not having done sufficient to prevent the incident (O'Carroll *et al.*, 1993). To compound the situation, there is evidence that "survivors" of a suicide may receive less social support than is the case after deaths from other causes (Hauser, 1987).

- The effects of a suicide can be amplified by the phenomenon of clustering whereby an unexpected number of suicide deaths in adolescents occur in a short period of time in a community following a suicide in that community (Gould, 1990). It is estimated that this mechanism accounts for 4% of all teenage suicides in the USA and that the incidence of "cluster suicides" is increasing (Gould, 1990; Shaffer and Piacentini, 1994).

- The recognition has been growing that a proportion of completed suicides may have been prevented by the timely and appropriate management of the psychiatric disorders that characterise the majority of adolescents who commit suicide. (Callahan, 1993). Psychological autopsy studies conducted in New York (Shaffer et al., in press) and Western Pennsylvania (Brent *et al.*, 1993) confirmed that the prevalence of mood, disruptive, and substance abuse disorders is higher in adolescent suicide completers than in matched controls (Brent *et al.*, 1988; Callahan, 1993; Juon *et al.*, 1994; Marttunen *et al.*, 1991; Rich *et al.*, 1986; Runeson, 1989; Shaffer and Piacentini, 1994).

- Finally, it has been observed that the incidence of completed suicide among young males has been rising in both developed and developing countries (Burton *et al.*, 1990; Diekstra and Gulbinat, 1993; Diekstra *et al.*, 1995; Dyck *et al.*, 1988; Kolmos, 1987; Kosky, 1987; McClure, 1986; Moens *et al.*, 1988; Shaffer *et al.*, 1994; Shaffer and Piacentini, 1994; Skegg and Cox, 1991; WHO, 1993a). This is exemplified by the situation in England and Wales, where the suicide rate rose from 23 per million in 1973 to 57 per million in 1990; this represents an increase of 148%! (McClure, 1994). In the USA, the suicide rate for white males reached a peak in 1988 and has subsequently stabilised; however, for black and other minority males the suicide rate has increased markedly since 1986 (Shaffer *et al.*, 1994).

Various explanations have been advanced for the increase in the incidence of completed suicide among young males. Among the most plausible is that it is due to an increase in substance abuse, which is an aetiological factor that has been increasing differentially among young males in the time period over which the incidence of suicide has been increasing (Kandel, 1993; Shaffer and Piacentini, 1994). As regards the recent increase in the suicide rates for young African Americans, Shaffer *et al.* (1994) have suggested that the mechanism of imitation or identification (Shaffer and Piacentini, 1994) may operate within identifiably distinct groups, and that this may account for this increase in suicide mortality rate for blacks. According to this argument, factors that reduce cultural distinctiveness (such as residential and occupational integration) are likely to lead to an equalisation of rates (Shaffer *et al.*, 1994).

One obvious factor in the South African context that would tend to decrease cultural distinctiveness is urbanisation. Since this process affects black South Africans to a greater extent than other South Africans, one would anticipate that the suicide rate in black adolescents would be increasing (Flisher, unpublished document). There are no South African studies in which the longitudinal trends for adolescent suicide mortality are documented. However, there is one longitudinal study involving all age groups that does indeed demonstrate such an increase; Mkize (1992) found that the suicide rate for blacks in Umtata rose from 2,0 to 11,6 per 100 000 between 1971 and 1990. In addition, Pillay *et al.* (1992) studied patients of all age groups referred to the Department of Psychiatry at Edward VIII Hospital in Durban. They reported that the number of African patients referred increased by 59% from 1985 to 1986. However, it is necessary to interpret their findings with caution

owing to the small sample size (N = 51 in 1986) and the biases associated with referred samples.

Non-fatal suicide attempts and suicidal ideation

The above discussion has focused on completed suicides which account for only part of the broader problem of suicidality since they ignore non-fatal suicide attempts and suicidal ideation (Leonard and Flinn, 1972; Smith and Crawford, 1986; Ramsay, 1985; Paykel *et al.*, 1974). Estimates of the ratio between completed suicides and non-fatal attempts, based on hospital figures, vary between 40 and 120 to 1 (Diekstra, 1990; Smith and Crawford, 1986; Ladame and Jeanneret, 1982). Clearly, these estimates would be higher if those who attempted suicide and did not present at hospitals were also taken into account (Smith and Crawford, 1986).

These non-fatal suicide attempts are important from at least three points of view. Firstly, there can be considerable organic morbidity from the unsuccessful attempts; not only could these effects be permanent (for example, the sequalae of cerebral anoxia following being rescued from hanging), but the clinical and economic burden on the health care system is significant (Anonymous, 1991; Levin, 1988; Pfeffer *et al.*, 1984).

Secondly, a suicide attempt can serve as a predictor of subsequent fatal and non-fatal suicide attempts (Barter *et al.*, 1968; Garrison *et al.*, 1991; Kotila and Lönnqvist, 1987). Approximately half of adolescent suicide attempters make subsequent attempts (McIntire *et al.*, 1977; Shaffer *et al.*, 1988; Shaffer and Piacentini, 1994;

Spirito *et al.*, 1989). In a 6 to 8-year follow-up, 25 predominantly pre-pubertal inpatient suicide attempters and 28 inpatient suicidal ideators were compared to 64 nonpatients (Pfeffer *et al.*, 1993). It was found that suicide attempters were six times and suicide ideators were three times more likely than nonpatients to attempt suicide during follow-up (Pfeffer *et al.*, 1993). The only South African study to address the issue of previous suicide attempts in adolescents was conducted by Schlebusch (1985). This study was retrospective in that suicidal patients were asked about previous attempts. It was documented that of 548 suicidal adolescent patients seen in the Department of Psychiatry at Addington Hospital, Durban, 25,0% had made a previous suicide attempt.

Finally, the presence of suicidal thoughts can serve to indicate the presence of unmet psychosocial needs. These needs may be manifest by psychiatric disorder such as depression or by the conflicts or crises precipitating the attempt (Andrews and Lewinsohn, 1992; Garrison *et al.*, 1991; Roberts and Chen, 1995; Swanson *et al.*, 1992; Velez and Cohen, 1988).

As regards psychiatric disorder, it was mentioned above that suicide completers have a relatively high prevalence of psychiatric disorder. Among suicide attempters, there is evidence from a study in which 47 adolescent completers were matched with 47 matched hospitalised attempters that suicide attempters have a lower rate of affective, but not substance abuse or conduct disorders, than suicide completers (Brent *et al.*, 1991). Hospitalised suicide attempters are not representative of suicide attempters in general, as has been intimated above. Thus, despite the finding that suicide attempters have a lower rate of affective

disorders than suicide completers (Brent *et al.*, 1991), community-based studies have revealed that adolescent suicide attempters who were not necessarily hospitalised have a higher prevalence of depression than their non-suicidal counterparts (Garrison *et al.*, 1991; Trautman *et al.*, 1991; Velez and Cohen, 1988). In addition, studies have confirmed that suicide attempters also have a relatively high prevalence of disruptive disorder and substance abuse disorder (Apter *et al.*, 1988; Garfinkel *et al.*, 1982; McKenry *et al.*, 1983).

There is one study conducted among a population of South African adolescent suicide attempters in which the diagnoses have been recorded. Schlebusch (1985, 1986) studied a sample of 548 Coloured and white suicidal adolescents referred to the Department of Psychiatry at Addington Hospital in Durban. Psychiatric disorders were diagnosed in 54,7% of the sample. The most common disorder was adjustment disorder, which characterised 54,0% of those with a psychiatric disorder. Most of these adolescents were suffering from an anxious or depressed mood. This was followed by affective disorders (21,8%), conduct disorder (16,1%), and substance use disorders (8,1%). This study confirms the existence of these disorders in a population of South African suicide attempters. However, the validity of the conclusions are mitigated by substantial methodological shortcomings. Besides the fact that his sample was a hospital-based referred sample and not a community probability sample, a control group was not employed and the diagnoses were made by clinicians with unspecified professional training and experience using the DSM III (American Psychiatric Association, 1980) as opposed to standardised instruments.

Unmet psychosocial needs can also be manifest by the conflict or crises precipitating the suicide attempt. The most common precipitant to a suicide attempt is conflict with a family member or friend; other precipitants include school problems, rejection, drug or alcohol problems, an abusive environment and bereavement (Pronovost *et al.*, 1990; Rotheram-Borus and Trautman, 1988; Shaffer and Piacentini, 1994).

Schlebusch (1986), in the report mentioned above in which the psychiatric diagnoses of adolescent suicide attempters were reported, also listed the precipitants of the suicide attempt in his sample of adolescent suicide attempters. These precipitants were as follows: parent-child problems - 29,2%; academic problems - 22,2%; other specified family circumstances (most of which were associated with social and financial pressures) - 19,4%; and other interpersonal problems (mainly centred around difficulties with romantic partners) - 12,5%.

Pillay and Schlebusch (1987) studied the precipitants of parasuicide among a sample of 54 Asian youth in Durban. They found that the most common precipitating factor for the suicide attempt was parental restriction, which was present in 64,8% of the patients. This was followed by romance-related interpersonal difficulties with boyfriends or girlfriends and other family conflicts, which were reported by 25,9% and 9,3% of the sample respectively. In many cases the context for these precipitants was culturally rooted authoritarian parenting and the effects of acculturation (Flisher and Parry, 1994; Pillay and Pillay, 1987).

In conclusion, there is a substantial body of literature emanating from both within South Africa and other countries indicating that suicidal attempts are associated with both psychiatric pathology and precipitating stressors. There is the potential to provide interventions that would address the psychiatric disorder and improve the ability of the adolescent to deal with stressors in a more adaptive manner. This intervention could comprise either primary prevention or secondary prevention. In the former case, intervention prior to the suicide attempt would prevent the attempt while in the latter case intervention after the suicide would prevent future attempts. However, in order to have estimates of the scope of the problem it is necessary to include suicide attempts in studies in which the prevalence of risk behaviour of adolescents is documented.

b) International prevalence studies

There were no items about suicidal ideation or behaviour in the HBSC Study, and a literature review did not unearth any other studies in which data regarding adolescent suicidality are reported for countries participating in the HBSC Study. The YRBS carried out in the USA in 1991 included 4 questions regarding suicidality. The questions were independent and distinguished between suicidal thoughts, suicide plans, attempted suicide, and injurious outcomes from suicide (CDC, 1991b; O'Carroll *et al.*, 1993). The prevalence for each of these aspects in the previous 12 months are as follows: thought seriously about attempting suicide - 29,0%; made a specific plan to attempt suicide - 18,6%; actually attempted suicide - 7,3%; and made a suicide attempt that resulted in an

injury, a poisoning, or an overdose that had to be treated by a doctor or a nurse - 1,7% (Kann *et al.*, 1993).

Of these aspects, the items relating to suicidal thoughts and suicide attempts are directly relevant to the survey involving high-school students in the Cape Peninsula. A breakdown of the findings for these items according to gender, school grade, and race or ethnicity are provided in Table 2.4.

General comments about the YRBS findings

- The proportion of children who had thought seriously about suicide or made an actual attempt was high.

- The proportion of females who had seriously thought about committing suicide or who had actually attempted suicide was higher than that of males.

- For having thought seriously about committing suicide, there were no obvious trends in terms of school grade. However, for having actually attempted suicide, there was a consistent trend for the prevalence to decrease with increasing school grade; the prevalence decreased from 9,1 in grade 9 to 5,8 in grade 12 with the intermediate values being consistent with this trend.

Table 2.4 Suicidal behaviour among high-school students in the USA, 1991, YRBS (Kann et al., 1993)

Category	Thought seriously about suicide		Attempted suicide	
	%	95% confidence interval	%	95% confidence interval
Sex				
• Male	20,8	± 1,8	3,9	± 0,9
• Female	37,2	± 1,9	10,7	± 1,5
Grade				
• 9	29,1	± 4,0	9,1	± 2,7
• 10	29,5	± 3,2	7,6	± 1,6
• 11	31,6	± 2,7	6,3	± 1,8
• 12	25,8	± 3,0	5,8	± 1,3
Race or ethnicity				
• White	29,9	± 1,9	6,7	± 1,2
• Black	22,2	± 2,0	6,6	± 2,0
• Hispanic	26,8	± 3,7	7,9	± 1,8

- There were differences between the racial/ethnic groups for the variable regarding having thought seriously about suicide in the previous 12 months. White students were more likely than Hispanic students to have thought seriously about suicide, and the Hispanic students were more likely than the black students to have done so. The difference between the white students and the black students was statistically significant (Kann *et al.*, 1993). It is noteworthy that these differences were not present for the question involving suicide attempts in the previous 12 months; the prevalence for each group was within the 95% confidence intervals of the other two groups.

c) South African prevalence studies

Besides the studies mentioned above, there have been several reports dealing with suicidal behaviour of South African adolescents, many of which have been generated by the Durban Parasuicide Study (Du Preez and Schlebusch, 1992). However, the bulk of the work addresses issues in the management of suicidal adolescents (Schlebusch, 1981; Schlebusch and Minnaar, 1980) or is based on clinical samples (Peiser and Fehrsen, 1987; Schlebusch, 1985, 1986, 1988). One study investigated the prevalence of suicide attempts during adolescence among 82 adults aged 18 to 70 years; 14 (17%) reported having attempted suicide during their adolescence (Boult, 1988, 1992). This was regarded as a high prevalence, although no control data were provided to confirm this.

There are only two studies based on community-based samples of adolescents, which are summarised in Table 2.5. These studies had sampling frames confined to National Servicemen (Brink, 1992) and private high-school students (Stewart, 1992), and the results are thus not representative of the South African adolescent population as a whole. Furthermore, the studies are not comparable with each other owing to the differences in the sampling frames and criteria for suicidal behaviour. These findings will not be related to the findings from the USA owing to these methodological aspects. Possible explanations for some of the trends revealed by the YRBS will be provided in the Discussion of this thesis.

Table 2.5. South African community-based studies regarding the prevalence of suicidal ideation and behaviour

Reference	Education or occupation	Sampling strategy	Sex	Population groups	Criterion	Year	Sample size	Prevalence
Brink, 1992	National Service-men	Whole population	Male	White	Any prior suicide attempt	August 1990	7 598	7%
						January 1991	19 273	4%
						July 1991	7 241	8%
Stewart, 1992	Private high school students	Whole population	Both	White	Sometimes thinking about committing suicide	1990	720	33% (There was a rise up to std 9 and a slight drop in std 10)
					Thinking about suicide 'all the time'	1990	720	2%
					Suicide attempts in the year	1990	720	No. of students
								Std 6 0
								Std 7 7
								Std 8 8
								Std 9 18
								Std 10 5

2.2.2 Cigarette smoking

Several tens of thousands of studies have provided overwhelming evidence that cigarette smoking is detrimental to physical health (Yach *et al.*, 1992). Not only is it among the most important preventable causes of death both in developed and developing countries, but it increases morbidity and increases health care costs (Hodgson, 1992; Marcus *et al.*, 1993; Public Health Service [USA], 1989). The World Health Organisation has stated that:

> *Smoking related diseases are such important causes of disability and premature death in developed countries that the control of cigarette smoking could do more to improve health and prolong life in these countries than any single action in the whole field of preventive medicine.*
>
> (WHO, 1975).

a) Adverse outcomes

The adverse outcomes that have been associated with cigarette smoking in international studies include (Marcus *et al.*, 1993; Pan American Health Organization, 1992): *(i)* cardiovascular disease (for example, myocardial infarction, aortic aneurysm); *(ii)* malignancies such as carcinoma of the lung, larynx, mouth, oesophagus, bladder, kidney, cervix, pancreas, and stomach; *(iii)* cerebrovascular disease; *(iv)* chronic obstructive pulmonary disease; and *(v)* obstetrical and neonatal pathology from the mother's smoking such as intrauterine growth retardation, low birth weight, and infant mortality.

There have been several reports in which the impact of cigarette smoking on the mortality and morbidity of South Africans is examined. Yach and Joubert (1988) reported on the proportion of deaths due to smoking in South Africa in 1984 and the projected deaths related to smoking among Coloureds and blacks in the year 2000. In accordance with the World Health Organisation/International Agency for Research on Cancer (WHO/IARC)(1986), they defined smoking-related diseases as those for which excess mortality in smokers is attributable to smoking. This is a conservative definition of smoking-related diseases in that it does not include diseases for which: *(i)* excess mortality is attributed to smoking confounded with other factors; *(ii)* excess mortality in smokers may be partly or wholly attributable to smoking; and *(iii)* excess mortality in non-smokers may be preventable by smoking. Despite this conservative definition, they found that 34,5% of deaths among whites in 1984 were due to smoking-related causes. The corresponding figures for Asians, coloureds, and blacks were 24,5%, 14,5%, and 3,9% respectively.

They then calculated the increase in smoking-related deaths for blacks by the year 2 000, taking into account the expected aging of the black population and increased use of tobacco by blacks. They found that these deaths are expected to increase by between 140 and 1 200% by the year 2 000. Since blacks will comprise about 75% of the population by the year 2 000, this will result in a considerable burden for the health care delivery system.

Yach and Townshend (1988) reviewed South African studies that confirm the international conclusions that smokers are indeed at increased risk for various diseases, some of which contribute to the mortality just mentioned. These diseases include: cardiovascular disease (Coetzee, 1981; Dolder and Oliver, 1975; Rossouw *et al.*, 1983; Seftel *et al.*, 1987;

Sewdarsen *et al.*, 1987; Wyndham *et al.*, 1980, 1986, 1987), lung carcinoma (Willcox *et al.*, 1990;), other respiratory disease (Becklake *et al.*, 1987; White, 1985; Wiles and Faure, 1977; Yach *et al.*, 1985; Zwi *et al.*, 1964), oesophageal carcinoma (Bradshaw and Schonland, 1974; McGlashan *et al.*, 1982; Van Rensburg *et al.*, 1985), cervical carcinoma (Walker, 1985; Walker *et al.*, 1985), and leukoedema (Van Wyk, 1985).

Many of these diseases manifest themselves after many years of smoking. Exceptions include leukoedema, which is a diffuse opalescent lesion that typically occurs in the cheek mucosa and which is of minimal medical or cosmetic significance (Van Wyk, 1985), and certain types of respiratory disease. The latter were investigated in the studies by Benatar (1979) and Prout and Benatar (1983) among high school students in Cape Town. In the former study, there were no differences in the prevalence of chronic respiratory symptoms between smoking and non-smoking children; this was ascribed to the fact that the majority of children who smoked did so for less than one year. In the latter study, this finding was contradicted. Chronic cough, chronic expectoration of sputum, dyspnoea on exertion, symptoms suggesting asthma, and chest illness resulting in being absent from school were more commonly admitted to by smokers than by children who had never smoked. With the exception of the last symptom listed, ex-smokers fell between the two groups as regards reporting these symptoms (Prout and Benatar, 1983). The findings of this latter study are important in terms of intervention since these more immediate adverse effects on physical health may have greater impact on decisions of adolescents to quit smoking than more remote consequences (Marcus *et al.*, 1993; Seely *et al.*, 1971).

Information about factors preventing smoking among adolescents is of increasing importance since the focus of smoking prevention efforts has

recently shifted to this age group (Miller and Slap, 1989). Reasons for this include: *(i)* the poor outcome of smoking cessation programmes for adults; *(ii)* the observation that the majority of adult smokers initiate the habit while teenagers; *(iii)* the recent increase in the proportion of young females who smoke; and *(iv)* evidence that young people are starting to smoke at earlier ages (Fielding, 1987; Glicksman *et al.*, 1989; Miller and Slap, 1989; Silvis and Perry, 1987; Stanton *et al.*, 1989; Steenkamp et al, 1988; Van der Burgh, 1979). In this context, it is obviously necessary to have prevalence data regarding the smoking habits of adolescents.

b) International prevalence studies

HBSC Study

The students participating in the HBSC Study were asked if they had ever smoked and, if they had done so, whether they smoked every day, at least once per week but not every day, and less than once per week. In addition, they were asked a series of questions regarding the smoking habits of their parents. The only item corresponding to a question asked in the study involving high-school students in the Cape Peninsula was whether the respondent smoked every day. The responses to this item are presented in Table 2.6.

Table 2.6 Percentages of students who smoke at least one cigarette per day, 1990, HBSC Study (King and Coles, 1992)

Country	Age 11 years		Age 13 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
Austria	0	0	3	1	15	12
Belgium	3	1	4	1	11	13
Canada	1	1	5	9	13	18
Finland	1	0	13	8	28	25
Hungary	1	1	5	3	25	14
Norway	1	0	2	4	17	16
Poland	1	0	2	0	14	6
Scotland	1	1	5	4	12	13
Spain	0	0	4	1	12	19
Sweden	1	0	3	3	10	14
Wales	1	0	5	6	11	16

YRBS

The only item in the YRBS that approximately corresponds to the item included in the study reported in this thesis involved frequent cigarette smoking, which was defined as smoking cigarettes on 20 or more of the previous 30 days (Kann *et al.*, 1993). Of the sample, 12,7% reported that they smoke cigarettes frequently (CDC, 1991e; Kann *et al.*, 1993). The breakdown in this regard according to gender, grade, and race or ethnicity is presented in Table 2.7.

General comments and trends from the international studies

- There is a large amount of variation in the prevalence of frequent cigarette use (i.e. smoking at least one cigarette per day or smoking on at least 20 days in the previous 30 days) between countries. This is exemplified by the prevalence data for males aged 15 years; the prevalence varies between 28% (for Hungary) to 10% (for Sweden).

- There are no consistent differences between the genders. However, in the data from the HBSC Study, there may be a trend for the relative proportion of girls who smoke to increase with age.

Table 2.7 *Frequent cigarette use among high school students, 1991, YRBS (USA) (Kann* et al., *1993)*

(Note: frequent cigarette use was defined as smoking on 20 or more of the 30 days preceding the survey)

Category	Frequent cigarette smoking	
	%	95% confidence interval
Sex		
• Male	13,0	± 2,0
• Female	12,4	± 2,6
Grade		
• 9	8,4	± 2,1
• 10	11,3	± 2,6
• 11	15,6	± 2,9
• 12	15,6	± 3,3
Race or ethnicity		
• White	15,4	± 2,5
• Black	3,1	± 1,1
• Hispanic	6,8	± 1,6

- There was a trend for the prevalence of daily or frequent cigarette smoking to increase with age in the HBSC Study and with school grade in the YRBS. However, in the latter study, the percentage of frequent cigarette smokers was 15,6% for both grade 11 and 12, which indicates that there may be a leveling off in the prevalence of frequent cigarette smoking in the late teens. It is not possible to conclude whether this trend is also manifest in the countries in which the HBSC Study was carried out since students in grade 12 are generally older than 15 years of age.

- In the USA, there are significant differences between the racial/ethnic groups for frequent smoking; whites has the highest prevalence, followed by Hispanics, and then blacks.

c) South African prevalence studies

The previous studies in which the prevalence of cigarette smoking has been documented for South African adolescents are summarised in Table 2.8. With the exception of the study by Olivier *et al.* (1977), all the studies were carried out in the Cape Peninsula. Furthermore, with the exception of the study by Flisher and Chalton (1995), the studies all had as sampling frames school students that were attending school on the day that the data were gathered. This is an important limitation since there is evidence that absentees and dropouts have a higher prevalence of cigarette smoking than those attending school (Flisher and Chalton, 1995; Pirie *et al.*, 1988). These factors indicate that the generalisability of the findings may be limited. Despite this, there are however some trends that can be extracted from the findings.

Table 2.8 South African studies in which prevalence of adolescent cigarette smoking is reported

Reference	Criterion	School status of population	Sampling strategy	Sample size	Gen-ders	School standards or ages	Population groups	Prevalence (%)
Benatar, 1979	Unspeci-fied	C.T. high-school students	Not specified	605	Both	Ages 11-15	White & Coloured	*Whites:* 2,5 (100% of whom were boys) *Coloureds:* 15,2 (68% of whom were boys)
Disler, 1990	Current smoking	Attending a large HS in CT	Cluster	427	Both	Stds 8-10	Presumed white	Age (yrs) F M 14-15 36,7 6,1 16 31,6 24,3 17-18 42,7 25,9 Total: 37,6 22,0
Flisher and Chalton, 1995	Smoke at least one cigarette per day	School dropouts	Simple random	68	Both	Ages 13-19	Coloured	*Females:* 39,8 (95% CI: 25,6 - 54,1) *Males:* 34,4 (95% CI: 18,4 - 50,4)
Olivier *et al.*, 1977	Unspeci-fied	Bloemfon-tein high-sch. studs.	Cluster	1 505	Both	Stds 9&10	Presumed White	*Females:* 7,37 *Males:* 25,8

Reference	Criterion	School status of population	Sampling strategy	Sample size	Gen-ders	School standards or ages	Population groups	Prevalence (%)
Prout and Benatar, 1983	Current smoking	C.T. high-school students	Cluster	1 716	Both	*Stds:* 6-10 *Ages:* 11-19	White	Age (yrs) F M 11 0 0 12 11 0 13 11 8 14 13 9 15 20 19 16 39 29 17 28 31 18 37 39 19 0 20 (Total: 21)
Strebel *et al.*, 1989a	Daily or occa-sional smoking	Higher primary schools in three black C.T. townships	Cluster	673	Both	Stds 4&5 Ages 9-21	Black	*Females:* 0,8 *Males:* 23,7 *Age:* increasing prevalence with age for boys - <:12: 6,3 ≥ 16: 45

Reference	Criterion	School status of population	Sampling strategy	Sample size	Gen-ders	School standards or ages	Population groups	Prevalence (%)
Van Wyk , 1985	Daily smoking (including cigarettes, pipes, and "zolles")	Attending senior secondary schools in CT	Cluster	1 028	Both	*Ages:* 14-19 *Stds:* 6-10	Coloured	Age (yrs) 14 4,7 15 9,4 16 19,3 17 21,5 18 29,9 19 29,6 *Females:* 9,3 *Males:* 27,6 *Total:* 18,8
Van Wyk , 1985	Daily smoking (including cigarettes, pipes, and "zolles")	Attending reform schools	Total pop-ulation	968	Both	Ages 13-20	Coloured	Age (yrs) 14 (too few) 15 87,2 16 94,6 17 95,1 18 94,0 19 93,2 Females: 83,7 Males: 95,3 Total: 93,3

Gender

The proportion of dropouts who smoked was higher for girls than boys in the study by Flisher and Chalton (1995). However, the confidence intervals were wide and overlapped to a considerable extent. There were no obvious differences in the study by Prout and Benatar (1983), notwithstanding the possible tendency for smoking to be more prevalent in girls in the younger age groups and more prevalent for boys in the older age groups. The prevalence of cigarette smoking appeared to be higher for boys than girls in the studies by Benatar (1979), Olivier *et al.* (1977), and Strebel *et al.*, 1989a. In the former two studies, the significance of these differences was not confirmed by statistical analysis; however, the differences appeared to be sufficiently large in the light of the sample sizes to support the validity of these differences. In a separate publication, Strebel *et al.* (1989b) reported the results of a logistic regression analysis conducted on the same data set cited in Table 2.8 (Strebel *et al.*, 1989a); they reported that the adjusted odds ratio for current smoking for boys in relation to girls was 17,8 (95% confidence interval: 5,2 - 60,9). These findings contrast with those of Disler (1990) who found that the prevalence of girls who smoked was higher for girls than boys in all three age groups. The students in her sample were of higher social class than those in the other studies since they were attending a private school and the study was completed more recently than the other studies. It is possible that these factors may have contributed to her findings.

As mentioned above, the findings from the HBSC Study and the YRBS indicate that there are no consistent differences between the genders in terms of the prevalence of frequent cigarette smoking.

The differential patterns for trends of smoking by gender suggest different stages in the epidemic of smoking in the developed world. Until the 1920's, smoking was extremely rare among women. In the 1920's, a segment of women began to smoke, *viz.* those who were college students and those who considered themselves trend setters (Fielding, 1987). Partly because of aggressive marketing campaigns targeted specifically at women, the prevalence of smoking among women has been increasing since the 1920's to the extent that the prevalence of smoking in women has overtaken that of men in parts of the developed world (Fielding, 1987; Report of the Surgeon General, 1986).

The findings of Strebel *et al.* (1989a,b) for black township students appear to reflect a community in which smoking is not encouraged for women. Conversely, the findings of Disler (1990) for urban, relatively affluent white students reflect a community in which the converse is the case. The findings of Benatar (1979) and Olivier *et al.* (1977) may reflect an intermediate position in the epidemic.

Age/school standard

Trends according to age were reported in four of the studies reported in Table 2.8 (Disler, 1990; Prout and Benatar, 1983; Strebel, 1989a; Van Wyk, 1985). The general tendency was for the prevalence of cigarette smoking to increase with age. In the case

of the studies by Prout and Benatar (1983) and Van Wyk (1985) for secondary school students, this trend was not preserved for the older age groups. The absence of statistical analysis makes it difficult to interpret this finding. Nonetheless, it is consistent with the results of the YRBS in which there was no difference in the prevalence of cigarette smoking between those in grades 11 and 12. Some of the reasons for a leveling off in the prevalence of cigarette smoking in the senior high school years could include the following:

- for the South African samples, the fact that there were small numbers of students still attending school at these older ages, resulting in sampling bias; and

- there may be a tendency for smokers in the senior high-school years to be particularly at risk for school absenteeism, dropping out, or attending special schools, which would tend to decrease the prevalence of smoking for those who were included in the study.

The latter point is consistent with reports from the USA (Chavez *et al.*, 1989; Eggert *et al.*, 1990; Kandel, 1975a; McKirnan and Johnson, 1986; Smart *et al.*, 1981; Yamaguchi and Kandel, 1984) and the study by Flisher and Chalton (1995) involving teenagers in a working-class community in the Cape Flats, Cape Town. They reported that those still attending school were significantly less likely to report smoking at least one cigarette per day than those who had dropped out of school.

The causal link between cigarette smoking and school non-attendance is likely to be complicated. Cigarette smoking has been shown to be associated with various other forms of risk behaviour, of which school dropout and anti-social behaviour are two examples (Dryfoos, 1990). With regard to anti-social behaviour, it is noteworthy that the reported prevalence of cigarette smoking is considerably higher among the students attending reform schools in the study by Van Wyk (1985) than among the other samples mentioned in Table 2.8. For these students, peer pressure is also likely to be playing a role (Jessor and Jessor, 1977).

Population group

Home language was not included as a variable in any of the previous South African studies in which the prevalence of cigarette smoking is reported (Table 2.8). However, as discussed above, the gender-determined patterns vary according to population group. There is an association between some population groups and home language and many of the population group differences would be manifest on the level of home language.

The issue of urbanisation is of particular importance for Xhosa-speaking students since they are most likely to be affected by this process in the Western Cape (Everatt and Orkin, 1991). Strebel *et al.* (1989a) addressed this issue explicitly. Children were sampled from the following three areas to reflect differing levels of urbanisation: *(i)* Langa, a settled urban community; *(ii)* Site B in Khayalitsha, a population of recent arrivals in an urban

environment; and *(iii)* other parts of Khayalitsha, of intermediate urban status.

After adjusting for age, there were no differences in smoking status between the schools. They did not compare the smoking prevalence for girls owing to the low prevalence of smoking for girls (Table 2.8). This finding does not exclude the possibility of differences between adolescents according to the length of time they had lived in an urban environment since it is possible that the students attending these schools were not homogenous in terms of urbanisation status. It is necessary to conduct analyses in which there is data regarding the length of time that each student had lived in an urban area to clarify this issue.

2.2.3 Alcohol use

It has been estimated on the basis of production figures and estimates of imports and exports that South Africans consumed over 4 billion litres of alcohol during 1994, which is equivalent to over 100 litres *per capita*! (Parry, 1995) The impact of this on the health of South Africans has been forcefully stated by Seftel (1985):

> *In South Africa with its mix of first and third world populations alcoholism is an especially serious problem. In Black and Coloured adults it is probably the single major cause of mortality, particularly from violence and the pernicious combination of heavy drinking and malnutrition; in Whites it ranks at the top of the death league together with cardiovascular disease and cancer; and in the Asian*

community it is emerging as an increasingly serious disorder. Its psychosocial and economic toll is immense and incalculable.

(Seftel, 1985, p1377,
quoted in *Urbanisation and Health Newsletter* 1994; **21**)

a) Adverse outcomes

Long-term health outcomes

Long-term health outcomes of alcohol misuse are extensive and affect every system of the body. They include: *(i)* cardiovascular disease such as hypertension; *(ii)* malignancies of the liver, oesophagus, nasopharynx, and larynx; *(iii)* neurological diseases such as peripheral neuropathy and cerebellar degeneration; *(iv)* functional abnormalities of the immune, endocrine, and reproductive systems; and *(v)* gastrointestinal diseases (such as liver disease, including fatty liver, alcoholic hepatitis, and cirrhosis), oesophagitis, peptic ulcer disease, and chronic pancreatitis (Blanken, 1993; Driver and Swann, 1987; Steyn *et al.*, 1992). In addition, there are various psychiatric conditions associated with chronic alcohol misuse, including withdrawal, withdrawal delirium, dementia, amnestic disorder, sexual dysfunctions, and psychotic, mood, anxiety, and sleep disorders (American Psychiatric Association, 1994).

The only recent published South African studies in which the chronic effects of alcohol misuse are studied were by Sumaruk *et al.* (1992) and Walker *et al.* (1992) for cancer of the oesophagus and prostate respectively. The former study confirmed the

international conclusion that alcohol misuse is a risk factor for oesophageal carcinoma while the latter study failed to do so for prostatic carcinoma. There are no studies in which the contribution of alcohol misuse to the burden of chronic diseases in South Africa has been documented.

Adolescents are rarely chronic alcohol abusers, and patients presenting with the above diseases are likely to be in their thirties or older (Fillmore, 1988; Vingelis and Smart, 1981; WHO, 1993). Despite this, these diseases are relevant for adolescents since the patterns of pathological drinking from which they result tend to be laid down in adolescence (WHO, 1993). It is however the *short-term* adverse consequences of alcohol misuse that are of more immediate relevance to young people.

Short-term health outcomes

Young people are particularly vulnerable to short-term adverse health outcomes of alcohol misuse for two reasons: *(i)* they may have low tolerance due to their relatively smaller body size; and *(ii)* they may lack experience with the effects of alcohol (Blanken, 1993). As a result of the latter factor they may not be able to predict the quantity they must imbibe before becoming disinhibited, and they may thus fail to take the necessary steps to prevent adverse alcohol-related incidents such as motor vehicle accidents or interpersonal violence.

In South Africa, 56,8% of all deaths of those aged 10 to 19 years are caused by external causes, the majority of which comprise

traffic accidents, assault, and suicide (Flisher *et al.*, 1992). In the USA, it has been calculated that alcohol is a factor in approximately half of all deaths due to these causes (Perrine *et al.*, 1988, cited in Blanken, 1993). It is unknown whether this estimate is also applicable for South African adolescents. However, there is evidence that *across all ages* alcohol is a factor in traumatic deaths (Becker, 1994; Butchart *et al.*, 1991b; Duflou *et al.*, 1988; Muller and Van Rensburg, 1986; Pieterse, 1985). So far as women homicide victims were concerned, Lerer (1992) found that for 56% of the 248 female homicide victims admitted to the Salt River State Mortuary during the study period had blood alcohol concentrations greater than 0,1g per 100 ml. Although these figures apply to all ages, they do indicate that alcohol is a factor in many traumatic deaths for all ages and this would be consistent with alcohol being a factor in a large number of traumatic deaths of adolescents. Studies addressing this issue are urgently needed in South Africa.

The necessity for documenting the contribution of alcohol to traumatic deaths of South African adolescents is emphasised by the finding that for every young person killed in an incident of alcohol-related trauma, approximately another ten will be maimed or seriously injured (WHO, 1993).

Van der Spuy (1993a) reported that the alcohol positivity rate for those individuals of all ages involved in both non-fatal and fatal pedestrian trauma in the Cape Town municipal area in 1989 are high (61,2% and 75,8% respectively), and that very high blood alcohol concentrations were common. Data specific for the adolescent age range (10 to 19 years) has been derived from the Cape Metropolitan study of the National Trauma Research

Programme of the South African Medical Research Council (Strydom, 1994). A total of 5 815 cases of injury were obtained from nine hospitals in the Cape Town Metropole (Strydom, 1994). The percentages of adolescents whose injuries were assessed on clinical grounds to be alcohol-related are presented in Table 2.9. It should be noted that these figures tend to underestimate the extent of alcohol relatedness in that the estimates would be higher if based on breath or blood analysis (Van der Spuy, personal communication). It is nonetheless a cause for concern that more than a quarter of the adolescents who were injured had sustained injuries that were assessed to be alcohol-related.

Finally, alcohol can have teratogenic effects. Not only can it cause various birth defects and mental handicap, but also the fetal alcohol syndrome which is characterised by, *inter alia*, growth retardation, mental handicap, and facial deformations (Abel and Sokol, 1987; Blanken, 1993). Although the effects of these conditions are clearly long-term, they are included in this section in which short-term health outcomes are addressed since they can develop after alcohol consumption for a relatively brief period of time.

Adverse economic outcomes

Economic effects of alcohol are borne by the individual, the family, the community, industry, and society as a whole (Parry, 1995). The South African National Council on Drug and Alcohol Abuse (SANCA) has calculated that the costs of alcohol use are five billion rand per year; this estimate took into account alcohol related medical conditions, violence and crime, traffic accidents, lost

Table 2.9 *Clinically assessed alcohol-relatedness of injuries of adolescents, 1990, Cape Metropolitan Study of the National Trauma Research Programme of the South African Medical Research Council (Van der Spuy, personal communication)*

Alcohol related	Age group					
	10 to 14 years		15 to 19 years		All 10 to 19 years	
	N	%	N	%	N	%
Yes	522	(3,1)	7 152	(25,9)	7 674	(17,3)
No	15 350	(91,5)	18 227	(66,0)	33 577	(75,6)
Unknown	897	(5,3)	2 250	(8,1)	3 147	(7,1)
Total	16 769	(99,9)	27 629	(100,0)	44 398	(100,0)

productivity, fire damage, and programmes to combat alcohol-related social problems (Langley, 1986 and Cape Times, 1994, both cited in Parry, 1995).

b) International prevalence studies

HBSC Study

The following percentages from this study are relevant for the study involving high-school students in the Cape Peninsula:

- students who have tasted an alcoholic drink;
- students who drink alcoholic beverages at least every week; and
- students who have been drunk at least once.

These percentages are presented according to country, age, and gender in the Tables 2.10 - 2.12. The percentages for the latter two items are derived from the responses to other questions; for example, the percentages of students who drink alcoholic beverages at least once every week are derived from the numbers of students indicating that they had drunk these beverages "Every day" or "Every week".

Table 2.10 Percentages of students who have tasted an alcoholic drink by age and gender, 1990, HBSC Study (King and Coles, 1992)

Country	Age 11 years		Age 13 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
Austria	74	69	88	88	96	96
Belgium	72	66	84	82	91	88
Canada	76	70	89	88	94	94
Finland	65	46	85	79	91	96
Hungary	61	49	78	75	88	92
Norway	35	22	57	51	84	80
Poland	73	63	82	67	88	85
Scotland	80	70	92	90	97	97
Spain	78	64	86	82	96	92
Sweden	72	54	82	73	93	91
Wales	82	75	93	92	97	98

*Table 2.11 Percentages of students who drink alcoholic beverages at least every week by age and gender, 1990, HBSC Study (King and Coles, 1992)**

Country	Age 11 years		Age 13 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
Austria	6	6	17	7	37	18
Belgium	14	6	18	13	37	24
Canada	8	3	14	11	33	24
Finland	7	1	9	8	12	7
Hungary	5	1	6	2	20	4
Poland	3	0	5	1	10	3
Scotland	9	4	17	15	32	26
Spain	9	3	14	7	42	29
Sweden	6	6	17	7	37	18
Wales	16	7	20	16	47	35

* Data are not available for Norway

*Table 2.12 Percentages of students who have been drunk at least once by age and gender, 1990, HBSC Study (King and Coles, 1992)**

Country	Age 11 years		Age 13 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
Austria	16	13	31	25	53	47
Belgium	25	12	30	22	45	41
Canada	17	9	35	34	60	61
Finland	8	3	32	23	67	62
Hungary	13	4	20	9	54	29
Poland	15	4	23	7	42	24
Scotland	17	9	40	31	61	55
Spain	13	7	26	17	51	40
Sweden	6	3	15	9	48	45
Wales	33	13	47	44	74	70

* Data are not available for Norway

As for the HBSC Study, there are three items that are relevant for this review. It was stated at the beginning of the section in which questions regarding alcohol use were asked that drinking alcohol did not include drinking a few sips of wine for religious purposes. As for the HBSC, the percentages presented in this section are derived from several categories of response to questionnaire items. The percentages are as follows:

- students who had ever consumed alcohol in their lifetime - 81,6% (95% CI: 79,0 - 84,2);

- students using alcohol currently, defined by having consumed at least one drink of alcohol during the 30 days preceding the survey - 50,8% (95% CI: 47,4 - 54,2); and

- students reporting episodic heavy drinking, defined by consuming five or more drinks of alcohol on at least one occasion during the 30 days preceding the survey - 31,3% (95% CI: 28,0 - 34,6).

Results for these items according to gender, grade, and race/ethnicity are presented in Table 2.13.

Table 2.13 Use of alcohol among high-school students in the USA, 1991, YRBS (Kann et al., 1993)

	Ever used alcohol		Consumed at least one drink of alcohol in the previous 30 days		Consumed 5 or more drinks at least once in the previous 30 days	
	%	95% confidence interval	%	95% confidence interval	%	95% confidence interval
Sex:						
• male	82,3	± 2,9	52,7	± 3,8	36,5	± 4,2
• female	80,9	± 2,7	48,8	± 3,2	25,9	± 2,5
Grade:						
• 9	71,8	± 4,3	40,9	± 5,1	22,6	± 3,9
• 10	80,4	± 3,7	47,8	± 3,3	27,1	± 3,4
• 11	86,9	± 2,7	54,5	± 3,9	36,3	± 4,9
• 12	86,8	± 2,2	59,9	± 4,3	39,3	± 5,3
Race/ethnicity:						
• white	83,0	± 2,9	52,9	± 3,5	34,9	± 3,2
• black	78,2	± 3,4	42,0	± 4,8	16,8	± 3,8
• Hispanic	85,0	± 3,5	54,3	± 5,4	32,2	± 5,8

General

Substantial numbers of students in each of the countries for which data are available indicated that they had ever used alcohol, that they do so at least weekly or have done so in the previous 30 days, and have ever got drunk or had consumed five or more drinks on at least one occasion in the previous 30 days.

It is not possible to draw direct comparisons between the findings in the countries where the HBSC Study was carried out and the USA since the items were defined differently. However, it is clear that, as for many other of the risk behaviours included in this literature review, there are substantial differences between countries in the prevalence of alcohol use within each category of use as defined above. The difference is most extreme for the item involving ever having tasted alcohol for girls aged 11 years; Norwegians had the lowest prevalence of 22%, while Wales had the highest at 75%.

Gender

Except for three countries for those aged 15 years in the YRBS study, a greater percentage of males than females reported having ever used alcohol, using it at least once weekly, and having ever been drunk. In the YRBS, a greater percentage of males reported ever having used alcohol, having consumed at least one drink of

alcohol in the previous 30 days, and having consumed five or more drinks on at least one occasion in the previous 30 days. However, for the former two aspects, the differences were small and the 95% confidence intervals overlapped, and the difference is thus of dubious import.

Tables 2.10 - 2.12 reveal some noteworthy trends regarding gender differences for alcohol use in the HBSC Study. For the item involving having ever used alcohol, the differences between the genders tend to diminish with increasing age. Thus, boys thus tend to commence drinking at an earlier age than girls, but by the age of 15 years the prevalence of ever having tasted alcohol has equalised between the genders. Conversely, for the item involving using alcohol at least once weekly, the differences tended to increase. There were no obvious trends for the item involving having ever been drunk.

Grade/age

With the exception of weekly drinking for Finnish girls, there is a tendency for the prevalence of alcohol use to increase with age/grade. This applies to each category of alcohol use, both genders, and both international studies.

Race/ethnicity

In the YRBS study. The trend was for the prevalence of drinking to be higher among white and Hispanic students than black students.

Some of these differences were statistically significant; white students were significantly more likely than black students to have used alcohol during the 30 days preceding the survey, and episodic heavy use (that is, consuming five or more drinks on at least one occasion during the 30 days preceding the survey) occurred significantly more often among white and Hispanic students than among black students.

c) South African prevalence studies

The studies in which the prevalence of alcohol use among South African adolescents is documented are summarised in Table 2.14. In addition to these reports, there are two studies in which attitudes of groups of South African adolescents to alcohol use are explored (Nkonzo-Mtembu, 1994; Ziervogel *et al.*, 1994), but these will not receive further attention since they are not directly relevant to the focus of this review.

Most of the previous work involves white adolescents; the only studies in which the samples did not consist entirely of whites were those of Flisher and Chalton (1995), Nkhoma and Maforah (1994), and Parry *et al.* (1993); furthermore, only one of these studies involved school students (Parry *et al.*, 1993). Also, as with many other risk behaviours, there is only one study in which the prevalence of alcohol misuse among dropouts is examined (Flisher and Chalton, 1995). Since there is evidence that the prevalence of alcohol misuse is higher in dropouts than those still attending school, the fact that the sampling frames of the above studies are confined to school attenders could result in an underestimate of the prevalence of alcohol use among South African adolescents (Flisher and Chalton, 1995; McKirnan and Johnson, 1986).

Table 2.14 South African studies in which the prevalence of adolescent alcohol use is reported

Reference	Population	Sampling strategy	Sample size	Sex	School standards or ages	Pop. groups	Criterion	Prevalence (%)		
Department of Education and Culture, 1990*	Stds 8 and 10 nationally	Not provided	Not provided	Both	*Stds:* 8&10 *Ages:* not provided	White	Drinking on 2 or more days per week	10,3		
Disler, 1990	Stds 8-10 at a CT high school	Whole population	427	Both	*Stds:* 8-10	White	*Ever used:*	**Age**	**Boys**	**Girls**
							1. beer	≤ 16	84,2	65,7
								17	92,9	68,3
								≥ 18	87,1	54,5
								All	87,0	64,7
							2. wine	≤ 16	85,0	73,3
								17	90,7	90,7
								≥ 18	83,8	97,2
								All	86,3	82,9
							3. spirits	≤ 16	67,2	32,1
								17	67,9	50,8
								≥ 18	71,0	59,0
								All	68,0	42,3

							Used once only: 1. beer 2. wine 3. spirits	 31,8 24,4 30,8
							Previously used but stopped: 1. beer 2. wine 3. spirits	 3,3 2,6 3,3
							Currently use: 1. beer 2. wine 3. spirits	**< once/ month** 23,9 37,0 18,4	**> once/ month** 13,8 18,6 2,0
Epstein, 1987*	Std 8 students in East London	Not provided	309	Both	*Std:* 8 *Ages:* Not provided	White	Sometimes, nearly always, or always get intoxicated when drink: • entire sample • current drinkers	 20 29	

Flisher and Chalton, 1995	Teenage high-school dropouts	Simple random	68	Both	13 to 19 years	Coloured		**Boys** (with 95% CI)	**Girls** (with 95% CI)
							Ever having used alcohol	59,8 (43,3 - 76,3)	42,0 (27,7 - 56,4)
							Used alcohol at least once in the past 7 days	29,9 (14,5 - 45,3)	16,3 (5,5 - 27,0)
							Used alcohol on ≥ 4 occasions in the past 7 days	9,0 (0,0 - 18,6)	0,0
							Had ≥ 5 drinks in the past 14 days	34,4 (18,4 - 50,4)	16,6 (5,7 - 27,3)
							Had ≥ 5 drinks on ≥ 4 occasions in the past 14 days	13,5 (3,8 - 23,1)	2,9 (0,0 - 7,8)
Nkhoma and Maforah, 1994	UCT students in a self-catering residence	Random	71	Both	*Ages:* ≤ 20 - 7% 21-24 - 52% ≥ 25 - 41%	*African:* 91% *Coloured:* 7% *Indian:* 2%	Current drinking Drinking throughout the weekend: • once a month • fortnightly	74,7 28,3 7,6	

Parry *et al.*, 1994	High-school students in Greater CT	Random (?)	340	Both	*Ages:* 12 - 18	All (but 73% white)	Ever drunk alcohol	83
							Had ≥ 5 drinks at least once in the past 14 days	23 (the majority of whom were male)
	Universit y of Cape Town students	Random (?)	372	Both	*Ages:* 18 - 25 years	All	Currently use alcohol	93
							Had ≥ 5 drinks at least once in the past 14 days	*Males:* 59 *Females:* 38 *Both:* 49

* Data extracted from Parry (1994)

Some comments about trends are provided below. It is difficult to compare the prevalence of alcohol misuse among the South African samples with that of the international studies since the variables were not defined in the same manner and the South African studies are (partly for the reasons mentioned above) not representative of adolescents (or even school students).

General

The only study in which a lifetime prevalence of alcohol use was reported was that by Flisher and Chalton (1995) involving high-school dropouts. The lifetime prevalence in that study was considerably lower than that reported in both the HBSC Study and the YRBS study. The study by Disler (1990) inquired about lifetime use of specific classes of alcohol as opposed to alcohol in general. However, it would appear that the lifetime prevalence of any alcohol use as reported in this study is of a similar order of magnitude as that reported in the international studies mentioned above; by the late teens only a small proportion of adolescents have not tasted alcohol at least once.

It is not possible to draw any valid conclusions regarding the prevalence of weekly drinking in the population studied by Flisher and Chalton (1995) compared to those of the countries in which the HBSC Study was carried out (King and Coles, 1992) since the most of the prevalences in the latter study were within the 95% confidence intervals for the prevalences in the former study and the age profiles of the samples differed.

The percentage of students having five or more drinks on one occasion in the previous 14 days were of a similar order of magnitude for the dropouts in the sample of Flisher and Chalton (1995) and for the high-school students in the study of Parry *et al.* (1993). These percentages are compatible with the equivalent percentages in the YRBS (although the recall period for this study was longer), and lower than for the university students in the sample of Parry *et al.* (1993).

Gender

As for the international studies for which results are provided above, there was a tendency for males to be more likely to engage in each of the types of drinking behaviour documented. The one exception to this trend applied for lifetime prevalence of wine drinking for females in the study by Disler (1990).

Age/standard

The only study providing sufficient data to permit the identification of trends according to age or standard was that by Disler (1990). For both genders and for each class of alcohol use, there was a trend for the prevalence to increase from the age of ≤ 16 years to 17 years. However, there were no consistent trends between the ages of 17 years and ≥ 18 years. This contrasts with the international studies cited above in which the tendency was for the

prevalence of each category of alcohol use/misuse to increase with age for each gender for each country involved.

The differences in the ages studied could explain the differences between the results of this study and those of the HBSC Study in that the latter study only included the age range 11 to 15 years; it is possible that if older students had been involved similar trends would have been observed. However, differences in the age range included cannot explain the differences between the results of the study by Disler (1990) and those of the YRBS. Substantive differences between the populations notwithstanding, it is possible that the relatively small sample size or the fact that the results are stratified according to class of alcohol in Disler's (1990) study could be relevant in explaining the difference.

Race/ethnicity

Although all population groups were included in the studies reported by Parry *et al.* (1993), the results are not provided separately for each population group. The study by Flisher and Chalton (1995) involved Coloured high-school dropouts while the remaining studies involved entirely white samples. The only item for which comparisons are possible involved lifetime prevalence of alcohol use of the Coloured high-school dropouts in the study of Flisher and Chalton (1995) and lifetime prevalence of use of various classes of alcohol by the white high-school students in the study by Disler (1990). The prevalence reported in the former study appeared to be lower than that of the latter study. However, it is difficult to interpret this finding since it could also reflect the

effects of language, social class, and status regarding school attendance.

2.2.4 Drug use

Until the 1960's, most drug taking by young people was for medicinal purposes or recreation in defined situations (Oppenheimer, 1985). In the 1970's, drug abuse among adolescents began to attract a great deal of attention in the popular and scientific literature (Grant-Whyte, 1977); the prevalence increased markedly and it became part of the "youth culture" (Oppenheimer, 1985).

South Africa was not exempt from the international concern about the extent of drug use by adolescents. In 1970, a Government Commission of Inquiry into the Misuse of Drugs concluded that,

> *... despite the lack of comprehensive available facts, the problem is largely concealed like an iceberg and should be viewed in a serious light. All possible steps should be taken to prevent it spreading further and effective treatment facilities should be provided for those who are already involved. Even though it can not yet be viewed as a problem of national scope, it can in the foreseeable future develop to this extent. There is the ominous possibility that developments in South Africa can follow the same diabolical pattern as in other countries if the necessary measures are not taken timeosly.*
>
> (Komitee van Ondersoek na die Misbruik van Verdowingsmiddels, 1970, p 41, translated)

The media in South Africa repeatedly reported that a "drug epidemic" was imminent, although this claim was never empirically validated (Van der Burgh, 1975, 1983). Indeed, it has been suggested that it would be more beneficial if the media emphasised the adverse consequences of less sensational substances such as tobacco and alcohol (Anonymous, 1983; Gillman, 1987).

The above Commission of Inquiry (Komitee van Ondersoek na die Misbruik van Verdowingsmiddels, 1970) and the media speculation (Van der Burgh, 1975, 1983) focused on white people. This overlooks the fact that there is convincing evidence that there is a rich and extensive tradition of cannabis smoking by South Africans of both Indian and African descent (Du Toit, 1980). As regards the latter, there were limited social contexts in which cannabis was smoked. Mature men would smoke cannabis alone on a couple of occasions during the day and with their contemporaries in the evening. It was also used by adult men preparing to go into battle, women in labour, and patients treated by a herbalist (Du Toit, 1980). This pattern differs from that pertaining to urban adolescent cannabis smokers in terms of the age of first use, the method of smoking, and the frequency of use (Du Toit, 1980).

There is however no tradition of cannabis use among the other population groups (Du Toit, 1980), and their patterns of drug use may have been more directly influenced by the trends in Europe and North America (Ben-Arie, 1984). In the USA, the prevalence of cannabis use reached a plateau in the late 1970's and early 1980's (Bachman *et al.*, 1981; Clayton and Ritter, 1985; Kandel, 1980) and subsequently declined (Bailey, 1989). However, there has been an increase in the use of cocaine, "crack", and multiple drugs (Bailey, 1989; Clayton and Ritter, 1985). The influence of

international shifts on drug use patterns in South Africa is unknown. Its distance from the world's leading drug markets and the strict nature of South African drug laws suggest that a different pattern might be expected in South Africa (Ben-Arie, 1984). It is also possible that an increase in drug use has occurred as a result of local socio-political changes, high unemployment levels, and rapid urbanisation (Flisher, unpublished document).

Despite these factors, there is little research in which the extent of the current problem in South Africa is documented. One cannot rely on official statistics in this regard since they tend to underestimate the true prevalence of drug use (Neethling, 1983; Van der Burgh, 1983). It is especially necessary to have information about the epidemiology of drug use in young people since the onset of drug use occurs almost exclusively in youth (Bailey, 1989; Van der Burgh, 1983; Van der Burgh and Heaven, 1979). It was thus decided to include drug use in the study comprising the focus of this thesis in which the epidemiology of risk behaviour among Cape Peninsula high-school students is investigated.

Many of the above comments refer specifically to cannabis use, although they may be applicable to other substances as well. Within each of the sub-headings of this section dealing with drug abuse, attention will be given to the substances included in the study involving Cape Peninsula high-school students, *viz.*

- cannabis;
- methaqualone ("Mandrax");
- inhalants; and
- injectable and other drugs.

a) Adverse outcomes

There is a considerable overlap between the adverse effects of alcohol and those of the illicit drugs. All the adverse consequences of alcohol use that are associated with a release of inhibition can also occur with illicit drugs, for example risky sexual behaviour, motor vehicle accidents, and physical fights (Blanken, 1993; Nel, 1983). Only a proportion of drug users go on to use drugs on an ongoing basis, and it is these adolescents who are likely to experience the most severe adverse consequences (Oppenheimer, 1985). Although it is in most cases difficult to establish the direction of causality, habitual drug users tend to be erratic school attenders, in trouble with the law, and alienated from their families, friends, and colleagues (WHO, 1993a). In addition, use of one class of drugs can serve as a stepping stone to the use of other illicit drugs, for example ongoing use of cannabis can serve as a stepping stone to the use of opiates (Kandel *et al.*, 1978).

In addition to these effects, specific somatic and mental sequelae of the use of some specific substances are mentioned below.

Cannabis

According to the Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) (American Psychiatric Association, 1994), there are two cannabis use disorders and several specific cannabis-induced disorders. The former include cannabis abuse and dependence wile the latter include cannabis intoxication, cannabis induced delirium, cannabis-induced psychotic disorder,

and cannabis-induced anxiety disorder (Solomons and Neppe, 1989; Thomas, 1993; Tunving, 1987). In addition, there is evidence that cannabis use can serve as an independent risk factor for schizophrenia (Andreasson *et al.*, 1987).

South African researchers have contributed significantly to knowledge regarding the effects of cannabis ingestion. Ames was among the first to document the effects of cannabis ingestion in humans (Ames, 1958) and primates (Ames, 1983). There has been much controversy about whether acute psychotic reactions in clear consciousness can occur following cannabis use (Teggin, 1983). In his review of psychiatric symptoms in cannabis users, Thomas (1993) referenced only one case control study in which this issue is addressed, which was carried out in Cape Town by Rottanburg *et al.* (1982). They compared 20 psychotic men showing high urinary cannabinoid levels with 20 matched psychotic men with no urinary evidence of cannabis use. Cannabis users showed significantly more hypomania and agitation, and less incoherence of speech than non-users (Ben-Arie, 1983; Rottanburg *et al.*, 1982). This finding was used to provide research support for the existence of an acute psychotic reaction in clear consciousness can occur following cannabis use (Thomas, 1993). A similar conclusion was reached by Solomons *et al.* (1990) in their study involving 100 black men admitted to hospital in Johannesburg with acute psychiatric symptoms.

There are other health problems that can result from the use of cannabis. Cannabis smoke contains many of the same constituents as tobacco smoke (Blanken, 1993) and can result in damage to the respiratory system (Gong, 1987).

Methaqualone ("Mandrax")

The substance is generally mixed with cannabis and then smoked. It is sold in capsule form on the black market. Tablets sold as "Mandrax" are a combination of methaqualone and a benzodiazepine (Wilson *et al.*, 1989).

Wilson *et al.* (1989) reported their experience of 12 patients seen at the Drug Counselling Centre, Observatory, Cape Town, who had been smoking cannabis mixed with "Mandrax". Based on both subjective and objective reports, they describe a clinical syndrome of intoxication consisting of the following stages:

1. an initial "rush" (euphoria, hallucinations, or suicidal thoughts) and a syncopal attack with a feeling of lower limb paralysis;

2. disorientation with purposeless wandering on the return of motor function; and

3. physical and verbal aggression.

Inhalants

There is sound evidence that inhaling solvents (for example, petrol, thinners, glues, and spray paints) can have both acute and chronic medical sequaelae (Cohen, 1973). The former include respiratory arrest and cardiac arrhythmias, while the latter include liver, kidney, blood and neurological disorders (Brozovsky and Winkler, 1965;

Cohen, 1973; Glaser and Massengale, 1962; Grabski, 1961; O'Brien *et al.*, 1971).

Research findings are inconsistent regarding whether the short-term neurological effects of inhaling solvents persist after the habit has been suspended (Chadwick *et al.*, 1989; Watson, 1980). This issue was addressed by Griesel *et al.* (1990) in a study carried out among "street children" in Johannesburg. They recorded the electroencephalograph activity of 22 male street children, the majority of whom were between 14 and 15 years of age, who had previously been glue sniffers but who had not engaged in this activity for at least the previous 6 weeks. They compared these recordings with those of 29 boys matched for age and social background (although they had not been street children).

They found that the former group had clinical and normative electro-encephalographic evidence of continuing brain disturbance, and concluded that glue sniffing is likely to have long term electrocerebral sequalae. Griesel *et al.* (1990) suggest that the impact of solvents on the central nervous system might be particularly conspicuous during adolescence; growing tissues might be affected since this phase corresponds to a spurt in neurophysiological growth (Epstein, 1974, cited in Griesel *et al.*, 1990). However, 10 of the boys in the group who had sniffed glue has sustained blows to the head, although information was not available on aspects such as amnesia or loss of consciousness. Griesel *et al.* (1990) did not address this potential confounding variable in their analysis, nor did they mention its possible influence while interpreting their results. Clearly, the results may have been

different if they had controlled for this aspect or conducted a stratified analysis.

In addition to the above physical manifestations of solvent inhalation, there are various psychiatric disorders induced by this practice, including inhalant intoxication, inhalant intoxication delirium, inhalant-induced persisting dementia, inhalant-induced psychotic disorder, inhalant-induced mood disorder, and inhalant-induced anxiety disorder (American Psychiatric Association, 1994).

Injectable and other drugs

This category includes substances such as cocaine (including "crack"), opiates (such as morphine and heroin), amphetamines, and LSD. The adverse affects of these substances will not be reviewed in detail owing to the low prevalence of their use in South Africa (see "South African prevalence studies" below).

There are various medical and surgical consequences of the use of the drugs included in this section. Cocaine use can result in death from myocardial infarction, cardiac arrhythmia, respiratory failure, and cerebrovascular accidents (Isner *et al.*, 1986; Oppenheimer, 1985). In addition, cocaine is generally sniffed, and this can cause damage to the nasal membranes (Oppenheimer, 1985). There is some evidence that the use of illegal drugs such as cocaine can have teratogenic effects, although other factors such as nutritional and environmental conditions may also be implicated in this regard (Blanken, 1993; Chasnoff *et al.*, 1989). Finally, physical injury can

result from the agitation caused by cocaine or the psychotic states caused by the hallucinogens (Strang and Connell, 1985).

In addition to the above effects, there are various psychiatric disorders that are associated with each of the above substances (i.e. cocaine, opiates, amphetamines, and LSD) (American Psychiatric Association, 1994). These disorders include (for each substance) dependence, abuse, intoxication, intoxication delirium, and psychotic, mood, and anxiety disorders (American Psychiatric Association, 1994).

However, one of the most catastrophic consequences of use of opiates or cocaine is HIV infection through sharing drug injection equipment with an infected person. Not only are habitual injecting drug abusers more susceptible to HIV sero-conversion on exposure to HIV but they develop AIDS sooner after infection than those who do not inject drugs (NACOSA, 1994). In the USA, this is the second most common method of infection, accounting for 22% of cases of HIV infection among those aged 13 years and older (Blanken, 1993). In South Africa, it was reported in July 1994 that there had only been one reported case of HIV infection through intravenous drug use (NACOSA, 1994). However, this does not indicate that this adverse effect of intravenous drug use should be minimised in South Africa. On the contrary, it indicates that measures to abort the progress of the HIV epidemic through this route are indicated (NACOSA, 1994).

b) International prevalence studies

No data regarding methaqualone usage are available in the international literature regarding prevalence of drug use since this drug is not used in the countries on which the international literature is based.

HBSC Study

Drug use was not included among the core questions of the HBSC Study. However, some items about drug use were included for the Canadian adolescents. The students were asked: "How often have you taken any of the following drugs?" Only three response options were included: "three times or more", "once or twice", and "never". It is thus not possible to provide data about current use. Selected results from this item are provided in Table 2.15 below.

YRBS

The 1991 Youth Risk Behavior Survey in the USA included two items regarding the use of cannabis (Blanken, 1993; CDC 1991a,c,e). One inquired as to the number of times that marijuana had been used during the lifetime of the respondent while the other inquired as to the number of times that it had been used in the previous 30 days (which was defined as "current use"). Among all students, 31,3% had used marijuana ever during their lifetime and 14,7% had used it during the 30 days preceding the survey (Current marijuana use) (Kann *et al.*, 1993). The results according to sex, grade, and race or ethnicity are provided in Table 2.16.

Table 2.15 Drug use by Canadian students, HBSC Study (King and Coles, 1992)

	Aged 13 years		Aged 15 years	
	Male (%)	Female (%)	Male (%)	Female (%)
Cannabis				
• Ever	11	10	26	24
• Once or twice	6	6	10	11
• ≥ 3 times	5	4	16	13
Solvents				
• Ever	6	6	7	5
• Once or twice	4	4	5	4
• ≥ 3 times	2	2	2	1
Lifetime use of other drugs				
• Cocaine	2	1	4	3
• Heroin, morphine, opium	2	1	4	3
• Amphetamines	3	2	7	6
• LSD	5	3	10	6

As regards the use of other drugs, 5,9% had used cocaine in their lifetime and 1,7% had done so in the 30 days preceding the survey. There were no questions about the use of solvents, heroin, morphine, opium, amphetamines, or LSD (Blanken, 1993). However, there were items about the use of steroids, the rationale for which was increasing concern about steroid use among male adolescents (Blanken, 1993).

Table 2.16 Cannabis use among high-school students in the USA, 1991, YRBS (Kann et al., *1993)*

Category	Cannabis use ever		Current cannabis use (i.e. use during the previous 30 days)	
	%	95% confidence interval	%	95% confidence interval
Sex				
• Male	29,8	± 3,2	12,5	± 1,7
• Female	32,8	± 3,8	16,7	± 2,9
Grade				
• 9	20,5	± 2,7	10,1	± 1,6
• 10	27,1	± 4,1	12,8	± 2,7
• 11	36,8	± 3,6	17,5	± 3,7
• 12	40,8	± 4,1	18,2	± 3,0
Race or ethnicity				
• White	31,8	± 4,0	15,2	± 2,8
• Black	31,2	± 4,9	13,5	± 3,3
• Hispanic	32,2	± 6,8	14,4	± 4,8

General comments and trends about the international studies

- A substantial proportion of adolescents in both Canada and the USA have used cannabis. In Canada, about a quarter of the students aged 15 years and in the USA almost a third of the students have tried cannabis. Although these differences may reflect actual differences in the adolescent populations between the two countries, they are more likely to reflect differences in the sampling strategy since those in the Canadian sample may have tended to be younger than those in the US sample. For a relatively large proportion of the adolescent population using cannabis does not constitute an isolated event; more than 12% of the Canadian sample have used it on three or more occasions and a similar proportion of the US sample had done so in the previous 30 days.

- There were no obvious differences between the genders for any of the parameters mentioned regarding cannabis use. However, for the students in the US, there is a *trend* for females to be more likely to have ever used cannabis and to be doing so currently, although the differences were minimal and the 95% confidence intervals overlapped for both items.

- For the items involving cannabis use, there is a trend for the percentage of students who replied affirmatively to an item to increase with age or school grade. This is exemplified by the data from the USA, where 20,5% of those in grade 9 reported having ever used cannabis compared to 40,8% for grade 12. In the Canadian sample, this trend was not manifest for solvent use. However, for the lifetime use of the other substances there

was a trend for the prevalence to increase from the age of 13 to that of 15 years, although the small numbers involved necessitates caution in accepting this conclusion.

- In the YRBS, there were no obvious differences between the race or ethnic groups for ever having used cannabis or for current cannabis use.

c) South African prevalence studies

The eight studies in which the prevalence of cannabis smoking among South African adolescents is reported are summarised in Table 2.17.

Besides the studies listed in Table 2.17, the following investigators have conducted studies with a sampling frame consisting of referred populations of adolescent cannabis users.

- Levin (1972a, 1972b, 1974) has produced three reports involving drug use by National Servicemen. He described samples of 188 and 448 National Servicemen that were seen at the Department of Psychiatry of 1 Military Hospital, Voortrekkerhoogte (Levin, 1972a,b, 1974). Among his findings were that multiple drug use was the rule and the majority had started taking drugs while still at school.

- Louw (1973) and Louw and Vermeulen (1974) used the Cattel 16PF (Cattel and Eber, 1962) to compare 100 young white male drug abusers (all of whom used, *inter alia*, cannabis) with a control group of 100 non drug-abusing young white men. They found

that the users were more reserved, more emotionally immature, having less superego strength, more sensitive, more forthright, more experimenting, more tense and less stable.

General comments

- Only two of the studies were reported in the past decade (Table 2.17). Both these studies were conducted in Cape Town; the study by Disler (1990) is unpublished and involved the students at a private high school, while the study by Flisher and Chalton (1995) involved high-school dropouts in a working class community in the Cape Flats. There are thus no data involving the prevalence of cannabis smoking in adolescents attending non-private schools in the past decade.

With the exceptions of studies by Flisher and Chalton (1995) and Van der Burgh (1974, 1975), the sampling frames to students currently attending high schools or universities. In the former study, the lifetime prevalence of cannabis use of teenage high-school dropouts was compared to that of teenagers still attending school (controlling for age). There were no significant difference in the lifetime prevalence of cannabis use between the two groups for either gender. In the latter study, all the respondents had left school; all but 0,2% of the sample had completed at least standard six and 46,3% had completed standard 10. No attempt was made to compare the prevalence of cannabis use by those in the sample with youth still attending school.

Table 2.17 South African studies in which prevalence of adolescent cannabis use is reported

Reference	Education status of population	Sampling strategy	Sample size	Sex	School standards or ages	Population groups	Criterion	Prevalence (%)		
Ben-Arie. 1984	University under-graduates	Simple random	Not stated	Both	Not stated	Presumed white	Ever used	Females: 12 Males: 24		
							Regular	2.4		
Disler, 1990	Attending a large HS in CT	Whole popula-tion	427	Both	*Stds:* 8-10	Presumed white	Ever used	Age	F	M
								<16	17,3	16,4
								17	30,6	16,7
								>18	35,3	41,8
								Total	24,6	20,3
							Regular use	13,2		
							More than once per month	2,6		
							Previous use	5,2		
							Once only	8,2		

Reference	Education status of population	Sampling strategy	Sample size	Sex	School standards or ages	Population groups	Criterion	Prevalence (%)			
Du Toit, 1978	HS students in Natal	Cluster	1 152 Afr 228 Col 89 Indian 337 White 410	Both	Std 10	African (A) Coloured(C) Indian (I) White (W)		A	C	I	W
							≥ daily	2,3	0,0	2,2	0,6
							≥ 1x/wk	5,4	2,2	1,6	2,1
							1-3x/mth	0,9	0,0	2,2	2,1
							Every 2-3 mths	0,5	2,2	1,9	1,9
							2-3x/yr	0,0	2,2	3,4	2,7
							≤ 1x/yr	5,9	5,6	4,4	3,9
Flisher and Chalton, 1995	School dropouts	Simple random	68	Both	*Ages:* 13-19 yrs	Coloured	Ever smoked on its own	*Females:* 8,7 (95% CI: 0,5-17,0) *Males:* 4,5 (95% CI: 0,0-11,5)			
Herr and Morley, 1972	University under-grads	Unknown	788	Both	Means: *females:* 18,9 yrs *males:* 20,5 yrs	Mainly white	Ever > once	22,1 14,4			

Reference	Education status of population	Sampling strategy	Sample size	Sex	School standards or ages	Population groups	Criterion	Prevalence (%)			
Levin, 1983	Medical students	Whole population	1981: 848 1983: 498	Both	Means ranged between 18 years for 1st yr students to 22 for 5th yr students	Mainly white		Acad. year	Ave. age	1981	1983
							Tried & stopped	I	18	10	8
								II	19	29	18
								III	20	16	15
								IV	21	15	-
								V	22	20	-
							Still smoking	I	18	6	7
								II	19	11	12
								III	20	19	32
								IV	21	22	-
								V	22	24	-
Simon, 1982	University under-graduates	Simple random	1 597	Both	Not stated	? mainly white	Ever smoked	25,1			
							Taken in other forms	7,2			

Reference	Education status of population	Sampling strategy	Sample size	Sex	School standards or ages	Population groups	Criterion	Prevalence (%)		
Van der Burgh, 1974, 1975	Left school	Unknown	4 588	Male	16-21 yrs; median 18.1 yrs	White		16-17	18-19	≥ 20
							Experi-mentally	7,7	10,2	12,8
							Occa-sionally	6,0	6,2	7,1
							Mod to heavy	3,7	3,5	5,5

- With the exceptions of the studies by Du Toit (1978) and Flisher and Chalton (1995), all the samples consisted entirely or almost entirely of white youth.

- Four of the studies have sampling frames confined to undergraduate students at English-medium universities; the study by Ben-Arie (1983) was carried out at the University of Cape Town while the others (Herr and Morley, 1972; Levin, 1983; Simon, 1982) were carried out at the University of the Witwatersrand.

- The criterion of "ever used" is present across the various studies reported. There is however very little uniformity with respect to the other criteria which hinders comparisons.

Overall prevalence

There are large differences in the reported prevalence of lifetime use of cannabis between the studies listed in Table 2.17, which ranged from 4,5% for males in the study by Flisher and Chalton (1995) to 24,6% for females in the study by Disler (1990).

The only other study in which the prevalence of cannabis smoking of high-school students is reported is that of Du Toit (1978) involving high-school students of all population groups in Natal. However, he did not report his prevalences by gender and did not provide estimates of lifetime prevalence in his study. Notwithstanding this, it would appear that the lifetime prevalence

reported by Disler (1990) was considerably higher than that documented by Du Toit (1978), both for white students and others. This discrepancy could be due to a multiplicity of factors, including differences in the place and time at which the study was conducted; the study by Disler (1990) took place in Cape Town in the late 1980's whereas the study by Du Toit (1978) took place in Natal in the 1970's. Also, the nature of the schools differed. The study by Disler (1990) included one English medium private high school whereas the "white" schools included in Du Toit's (1978) study included one Afrikaans medium high school, an English medium high school on the outskirts of the city and "two prestigious English medium schools in a wealthy and posh neighbourhood in Durban" (pp 8,9).

Gender

There are insufficient data to draw conclusions regarding gender differences in the prevalence of cannabis use. The only two studies in which the prevalences are provided for the genders separately are the two recent studies carried out in Cape Town by Disler (1990) and Flisher and Chalton (1995). In both studies, the prevalence of lifetime use was slightly higher in girls except for those above the age of 18 years in the former study. However, Disler (1990) provides no tests reporting the statistical significance of the differences and no estimates of the precision of the prevalences, while in the study of Flisher and Chalton (1995) the 95% confidence intervals are so broad and include the prevalence for the other gender so that the observed difference is of dubious consequence.

Age/school standard

Again, the available studies do not provide a sufficient basis to draw any valid conclusions regarding the pattern for cannabis use in relation to age or school standard. In the only available school-based study in which the data for lifetime prevalence are stratified according to age (Table 2.17), Disler (1990) found that there was a trend for the prevalence to increase with age, except that the increase between the ages of <16 years and 17 years for boys was less than 1%.

As regards medical students, Levin (1983) found that the prevalence of current smokers increased according to academic year while this trend was not present for those who had tried smoking cannabis and subsequently stopped. Also, in Van der Burgh's (1974) sample of young men who had left school, there was a tendency for the prevalence of experimental and occasional use to increase with age.

Population group

As for gender and age or school standard, it is not possible to extract clear trends regarding language or population group since most of the studies have samples consisting of whites or predominantly of whites. The only study in which adolescents of all the statutory population groups were included was that of Du Toit (1978). However, the following factors indicate that any conclusions regarding differences between the population groups should be regarded with caution: *(i)* the low prevalences; *(ii)* the possibility of

confounding factors; and *(iii)* the absence of estimates of the precision of the prevalences or statistical tests examining the significance of the differences between the prevalences for the different population groups.

Also, as mentioned above, the study was conducted in the 1970's and the results may no longer be applicable. These factors notwithstanding, it would appear that a greater proportion of Africans smoked cannabis daily or more frequently, or weekly or more frequently, than those belonging to other population groups. There are many possible explanations for this finding. One possibility is that the higher proportions of African students engaging in relatively frequent cannabis use is related to the role that cannabis serves in "African culture" in South Africa (as mentioned previously) (Du Toit, 1980). An implication of this is that those Xhosa-speaking students whose behaviour and attitudes are influenced by "traditional" values may be expected to manifest a higher incidence of cannabis use. Increasing urbanisation may thus result in a decrease in cannabis consumption (Flisher, unpublished document).

With the exception of the study by Levin (1983), all the studies cited in Table 2.17 involving the prevalence of cannabis use by South African adolescents also presented data regarding the prevalence of the use of other drugs. In two studies, findings about the use of other drugs in general were made, without giving particulars about the specific drugs involved; Ben-Arie mentioned that other drugs "barely figured, with the exception of amphetamines" (1984, p 13), while Van der Burgh (1974). Information about the prevalence of usage of other drugs is as follows.

- **Methaqualone.** The prevalence of lifetime methaqualone use was reported in three studies cited in Table 2.17 (Du Toit, 1978; Flisher and Chalton, 1995; Simon, 1982), with the highest figure being 3,5% for Flisher and Chalton's sample of teenage high-school dropouts. In addition, Levin (1974) reported that 7,8% of his sample of 448 National Servicemen admitted to the 1 Military Hospital, Voortrekkerhoogte, had used methaqualone. He did not report on the prevalence of methaqualone use in his other studies involving National Servicemen (Levin, 1972a,b).

- **Solvents.** Five of the studies mentioned in Table 2.17 provided data regarding the prevalence of solvent use (Disler, 1990; Du Toit, 1978; Flisher and Chalton, 1995; Herr and Morley, 1972; Simon, 1982). The prevalence of lifetime use of inhalants was highest in the high-school students comprising Du Toit's (1978) sample; the lifetime prevalence ranged from 9,7% for Indian high-school students to 16,6% of African high-school students. The next highest prevalence was 4,3% for the teenage high-school dropouts in Flisher and Chalton's (1995) sample, with the remaining prevalences all being below 3%.

- **Injectable and other drugs.** With the exception of the studies by Levin (1983) and Van der Burgh (1974, 1975), all the studies cited in Table 2.17 provide prevalence figures for one or more specific injectable and other drugs. However, in almost all cases, the prevalences are extremely low. The only lifetime prevalence for a specific drug that is above 5% is that of 7,1% for the lifetime prevalence of amphetamines among white high-school students in Du Toit's (1978) sample. It is difficult to

compare these results with those of the YRBS carried out in the USA since only cocaine use was included in that survey.

One can conclude that the prevalence data for drugs other than cannabis suggest that these other substances do not pose a significant challenge from the point of view of the public health in South Africa. However, it must be borne in mind that some of the characteristics of the studies mentioned in the general comments above, such as their being representative of specific subgroups only and (in most cases) having been carried out some time ago, limit the confidence with which this conclusion can be stated.

2.2.5 Road-related behaviour

The term road-related behaviour as used in this thesis refers to transport-related behaviour occurring on roads. It is used in preference to the term "traffic accidents" since the term "accident" implies that chance or misfortune has been operative; the unavoidability thus implied may lead to a negative attitude about intervention efforts (Tursz, 1986). Many authors thus use the term *injury* or, more specifically, *unintentional injury*. This term includes other types of injury besides that occurring on the roads, such as injury sustained while swimming or participating in other sport. The behaviour resulting in unintentional injuries included in this thesis is restricted to that occurring on the roads, and for this reason the term *road-related behaviour* was coined.

The concept of "epidemiological transition" is used to describe the changing patterns in disease distribution in developing countries, with the dominant causes of morbidity and mortality diseases changing from

infectious to noninfectious diseases (Omram, 1971, cited in Graitcer, 1992). However, injury from traffic "accidents" is often high in both developed and developing countries (Marcusson and Oehmisch, 1977; WHO, 1993a). Despite this, the prevention of traffic "accidents" is often not prioritised, particularly in developing countries. Graitcer (1992) suggests that part of the reason for this is that policy makers and public health officials do not consider injuries to be a public health problem or a preventable condition, and that this in turn is partly due to inadequate information. In South Africa, there is certainly a lack of relevant data in this regard, as will become clear in the review below.

a) Adverse outcomes

In many countries, unintentional injuries constitute the leading cause of death between 1 and 44 years of age (WHO, 1993a). The premature mortality and preventability associated with unintentional injuries are indicated by the years of potential life lost (YPLL) (CDC, 1982). For people dying in the USA in 1990, unintentional injuries accounted for 2 147 094 YPLL; the cause accounting for the second largest YPLL was malignant neoplasms (which accounted for 1 839 900 YPLL)(CDC, 1992f). Motor-vehicle accidents account for the largest proportion of deaths from unintentional injuries (Haddon and Baker, 1981; Public Health Service, 1991; Taket, 1986).

In South Africa, two reports by Kibel *et al.* (1990b,c) include the 10 to 14-year age group in analyses of injury-related mortality in South African children. However, the only report in which deaths of adolescent South Africans from road-related causes are analysed is that by Flisher *et al.* (1992) involving external cause mortality of South African adolescents,

relevant results from which are presented in Table 2.18. This table reveals that road-related deaths account for more deaths than any other causes for the age group 10 - 14 years; for the age-group 15 - 19 years, this is the case for whites and Asians but not for coloureds and blacks (for whom assault is the leading causes of death).

Disability is a more frequent outcome from a road "accident" than death. In the USA, for every person killed in a road accident there are on average 10-15 people with severe injuries and 30-40 with minor injuries requiring medical attention (CDC, 1985, cited in WHO, 1993a).

In South Africa, the extent of non-fatal road accidents is indicated by unpublished data provided by Professor John Knottenbelt, Head of the Trauma Unit at Groote Schuur Hospital in Cape Town. At that unit in 1991, for all ages, each death due to road-related accidents was paralleled by 44 admissions and 77 patients treated on an ambulatory basis for injuries due to this cause. Although no road-related deaths were recorded for the age group 13 to 19 years at Groote Schuur Hospital in 1991, there were 163 admissions and 391 patients treated on an out-patient basis (Knottenbelt, personal communication).

The above figures apply only to patients presenting at Groote Schuur Hospital, which is one of the two tertiary referral centres in the Cape Metropolitan area. It thus excludes patients presenting at other hospitals in the public sector as well as patients presenting at private facilities. The Cape Metropolitan Study, carried out by the National Trauma Research Programme of the South African Medical Research Council, addresses these aspects (Strydom, 1994).

Table 2.18 Proportional road-related mortality and road-related mortality rates per 100 000 for adolescents in South Africa for each population and age group, 1984-1986 (Flisher et al., *1992).*

	10 - 14 years		15 to 19 years	
	Proportional mortality	Mortality rate	Proportional mortality	Mortality rate
Whites (N = 1 446)	52,2	12,3	55,9	48,6
Coloureds (N = 1 817)	39,5	16,9	22,0	29,0
Asians (N = 287)	41,8	11,1	31,3	24,0
Blacks (N= 5738)	28,7	*	16,2	*

* Mortality rates were not calculated for blacks owing to the poor quality of the data (Flisher *et al.*, 1992)

A total of 5 815 cases were obtained from nine hospitals in the following magisterial districts: Belleville, Cape Town, Goodwood, Kuilsriver, Simon's Town, and Wynberg (Strydom, 1994). For *all* injuries, only 0,9% of those aged 10 to 19 years died after their initial assessment by a health professional (Van der Spuy, personal communication). However, 10,8% of all the injuries to adolescents aged 10 to 19 years were due to traffic accidents (Van der Spuy, personal communication); thus, *even if* all the deaths were due to traffic accidents as opposed to other causes, this would represent a small percentage of all adolescents presenting with injuries from traffic accidents. Data from the Cape Metropolitan study mentioned above also provides an indication of the extent of the problem of traffic injuries in the Cape Metropole from another point of view. Table 2.19 provides details about the extrapolated number adolescents injured in traffic accidents in 1990 in the Cape Metropole. There were almost 5 000 adolescents injured in traffic accidents sufficiently severely to require medical attention. For the age group 15 to 19 years, 1,3% of the population were injured in this manner.

An indication of whether the injured adolescents were drivers, passengers, or pedestrians is provided in Table 2.20. It can be seen that for all adolescents aged 10 to 19 years, approximately a third were in each of these categories. However, for younger adolescents, relatively more were involved as pedestrians than as driver or passengers.

In conclusion, the above review has indicated that traffic "accidents" contribute substantially to mortality and morbidity of adolescents in South Africa. Although environmental conditions are crucial in the causation of traffic "accidents", risk behaviour also contributes (Kibel, 1990). The latter aspect is addressed below.

Table 2.19 Injuries due to traffic accidents, 1990, Cape Metropolitan Study, National Trauma Research Programme of the Medical Research Council (Van der Spuy, personal communication)

	Age group		
	10 to 14 years	15 to 19 years	All 10 to 19 years
Extrapolated number of injuries due to traffic accidents	1 716	3 073	4 789
Extrapolated total number of injuries	16 769	27 617	44 386
Percentage of injuries due to traffic accidents	10,2	11,1	10,8
Population in the Cape Metropolitan Area*	206 443	241 689	448 132
Percentage of population injured in traffic accidents	0,83	1,3	1,1

* The total population of the Cape Metropole in 1990 was 2,517 million (City of Cape Town Health Department, cited in Van der Spuy, personal communication). The estimates of population size are based on the age group profiles from the 1991 Census (Van der Spuy, personal communication)

Table 2.20 Category of adolescents injured in traffic accidents, 1990, Cape Metropolitan Study, National Trauma Research Programme of the Medical Research Council (Van der Spuy, personal communication)

Category	Age group					
	10 to 14 years*		15 to 19 years**		All 10 to 19 years	
	N	(%)	N	(%)	N	(%)
Driver	434	(26,1)	1 128	(37,2)	1 562	(33,2)
Passenger	483	(29,0)	1 143	(37,7)	1 626	(34,6)
Pedestrian	747	(44,9)	764	(25,2)	1 511	(32,2)
Total	1 664	(100,0)	3 035	(100,1)	4 699	(100,0)

* Unknown in 52 cases

** Unknown in 38 cases

b) International prevalence studies

The HBSC Study did not include any items relating to road-related behaviour, and there are no data from other European or Canadian studies that fill this gap.

Data from two items in the YRBS are relevant for the study involving high-school students in the Cape Peninsula that is reported in this thesis. It was found that 27,7% (95% CI: 23,3 - 32,1) of the students always used a safety belt when riding in a car or truck driven by somebody else while (of those students who rode a motorcycle) 39,2% (95% CI: 33,4 - 45,0) always wore a motorcycle helmet (Kann *et al.*, 1993). The distribution of responses according to gender, grade, and race/ethnicity is presented in Table 2.21.

There were other items in the questionnaire that was used for the YRBS that are relevant for the study involving high-school students in the Cape Peninsula, for example, the prevalence of motorcycle riding and of travelling in a vehicle driven by someone who had been drinking alcohol (Public Health Service, 1993). However, the results for these items have not been published (Kann *et al.*, 1993) and are not available in unpublished form (Kann, personal communication).

Table 2.21 Safety belt and helmet use among high-school students in the USA, 1991, YRBS (Kann et al., *1993)*

Category	Motor vehicle passengers always using safety belts		Motorcycle riders always using helmet	
	%	95% confidence interval	%	95% confidence interval
Sex				
• Male	25,9	± 4,5	38,1	± 6,8
• Female	29,5	± 4,7	41,3	± 6,6
Grade				
• 9	23,4	± 4,2	38,6	± 6,6
• 10	29,6	± 5,1	40,6	± 7,6
• 11	29,1	± 4,1	38,3	± 8,8
• 12	28,6	± 6,1	39,1	± 6,8
Race or ethnicity				
• White	30,5	± 5,4	40,1	± 6,5
• Black	17,0	± 5,5	42,2	± 6,5
• Hispanic	22,1	± 4,6	27,0	± 8,5

The National Adolescent School Health Survey (NASHS)

The NASHS was designed to assess students' health-related knowledge, attitudes, and behaviors in eight areas, one of which was injury prevention (American School Health Association *et al.*, 1989). In 1987, a total of 12 067 students in the eighth and tenth grades from 220 schools throughout the USA completed an anonymous questionnaire in their classrooms (American School Health Association *et al.*, 1989).

It was mentioned above that the YRBS included items for which the results were not reported involving motorcycle riding and travelling in a vehicle driven by someone who had been drinking alcohol. However, data addressing these aspects are available in the report of the NASHS, although indications of the precision of these estimates are not provided (American School Health Association *et al.*, 1989). Specifically, the percentages of students who had engaged in these behaviours are as follows: *(i)* travelling in a vehicle with a driver who had used drugs or alcohol in the previous month - 38,6%; and *(ii)* riding a motorcycle or minibike - 59,9% (additional definition of this behaviour was not provided in the NASHS). A breakdown according to grade level and gender is provided in Table 2.22.

Table 2.22 Behaviours related to motor vehicle safety, 1987, NASHS (American School Health Association et al., *1989)*

	Grade 8		Grade 10	
	Male	Female	Male	Female
Travelling in a vehicle with a driver who used drugs or alcohol in the previous month	30,0	34,6	43,0	36,0
Riding a motorcycle or Minibike	69,9	49,1	71,7	47,7

Comments and trends from the international studies

Owing to the absence of suitable data from Europe, the following comments refer entirely to the situation in the USA.

General

The results of the YRBS study and the NASHS reveal that a substantial number of students in the USA engage in various risk behaviours on the roads.

Of all the risk behaviours reported, the behaviour for which fewest students were at risk involved travelling in a motor vehicle with a driver who used drugs or alcohol in the previous month.

Gender

There were no obvious differences between the genders for the items involving safety belt or helmet use and travelling in a vehicle with a driver who used drugs or alcohol. Although the difference for helmet use was not statistically significant (Kann *et al.*, 1993), the absence of indications of precision in the NASHS prevents confident conclusions about gender differences for travelling in a vehicle with a driver who had used drugs or alcohol. This point notwithstanding, the size of the differences for the item involving riding a motorcycle or motorbike indicates that boys may indeed be significantly more likely to engage in this behaviour.

Grade

In general, there were no consistent patterns regarding the prevalence of risky road-related behaviours according to grade. However, for girls for travelling in a vehicle with a driver who used drugs or alcohol in the previous month the prevalence increased from 30,0% to 43,0%.

Race/ethnicity

Data are presented for this variable in the YRBS study only. There were some significant differences for this variable. White motor vehicle passengers were significantly more likely than their black counterparts always to use a safety belt, while black motorcycle

riders were significantly more likely than Hispanic motorcycle riders always to use a helmet.

c) South African prevalence studies

The only study in which the actual behaviour of adolescents serving as a risk factor for injury from traffic accidents was that by Flisher and Chalton (1995) involving teenage high-school dropouts in a working-class community in the Cape Peninsula. Many of the items used in this study are identical to those in the study carried out in Cape Peninsula high schools that is described in this thesis, which makes the results of this study particularly pertinent. The relevant results are presented in Table 2.23.

One should exercise caution in extrapolating trends from the data for high-school dropouts to those still attending school documented (Flisher and Chalton, 1995; Kandel, 1975a; McKirnan and Johnson, 1986; Pirie *et al.*, 1988; Chavez *et al.*, 1989). In addition, the sample size in the study by Flisher and Chalton (1995) is relatively small and the confidence intervals for the estimates of the prevalence of the road-related behaviours relatively large. Notwithstanding these considerations, the following trends are detectable in the results presented in Table 2.23.

Table 2.23. *Percentages (with 95% confidence intervals) of teenage high-school dropouts in a working-class community in the Cape Peninsula involved in various forms of risky road-related behaviour (Flisher and Chalton, 1995)*

Behaviour	Males ($N = 28$)	Females ($N = 40$)	Total ($N = 68$)
Riding on a motorbike as a passenger or a driver[1]	29,5 (14,2 - 44,9)	12,4 (2,8 - 22,0)	19,1 (10,5 - 27,7)
Riding on a motorbike without a helmet[2]	60,8 (30,5 - 91,0)	47,1 (5,8 - 88,3)	55,4 (30,6 - 80,2)
Being involved in an accident while travelling in a motor vehicle (excluding motorbikes)[1]	10,5 (0,2 - 20,8)	8,7 (0,5 - 17,0)	9,4 (3,0 - 15,8)
Being injured by a motorvehicle, motorbike or bicycle while walking or standing[1]	0,0	2,9 (0,0 - 7,8)	1,8 (0,0 - 4,6)
Not wearing a seat belt on the last occasion travelling in the front passenger seat of a motor vehicle[3]	21,3 (6,7 - 35,9)	30,4 (15,6 - 45,2)	26,6 (16,1 - 37,1)
Travelling in a motor vehicle knowing or strongly suspecting that the vehicle was overcrowded[4]	39,3 (21,7 - 57,0)	42,3 (27,3 - 57,3)	41,2 (29,8 - 52,5)
Travelling in a motor vehicle knowing or strongly suspecting that the vehicle was not roadworthy or not safe to drive[4]	18,6 (4,5 - 32,7)	30,3 (16,3 - 44,3)	25,9 (15,7 - 36,0)
Travelling in a motor vehicle knowing or strongly suspecting that the driver did not have a licence[4]	24,2 (8,7 - 39,7)	30,3 (16,3 - 44,3)	28,0 (17,6 - 38,4)
Travelling in a motor vehicle knowing or strongly suspecting that the driver was affected by alcohol or cannabis[4]	12,1 (0,3 - 23,9)	8,8 (0,2 - 17,4)	10,0 (3,1 - 17,0)
Driving a vehicle that was overcrowded[5]	0,0	0,0	0,0
Driving a vehicle that was not roadworthy[5]	25,0 (0,0 - 59,4)	23,5 (0,0 - 58,6)	24,2 (0,0 - 48,8)
Driving a vehicle without a licence[5]	25,0 (0,0 - 59,4)	52,9 (11,7 - 94,2)	39,4 (11,4 - 67,4)
Driving a vehicle while affected by alcohol or cannabis[5]	0,0	0,0	0,0

1. Refers to the previous 12 month period
2. Refers to the previous 12 month period for those who had ridden on a motorbike or motor scooter as a passenger or a driver
3. Expressed in terms of those who had travelled in the front passenger seat of a motor vehicle in the previous 12 months and who had a seat belt available to them on the last occasion that they travelled in the front passenger seat of a motor vehicle
4. Refers to the previous 12-month period for those who had travelled in a motor vehicle in this period
5. Refers to the previous 12-month period for those who had ever driven a motor vehicle (excluding a motorbike) on a public road.

General

There were large variations between the prevalences of the road-related behaviours, with the prevalences of the behaviours ranging from 0,0% for driving a motor vehicle that was overcrowded or while affected by alcohol or cannabis to 55,4% for not using a helmet on the last occasion when riding on a motorbike as a passenger or a driver.

A relatively large percentage of students had been involved in accidents while travelling in a motor vehicle. This is consistent with the finding that for many of the behaviours putting the adolescents at risk for injury in a motor vehicle there was a relatively high percentage of students who had engaged in these behaviours. For the items involving overcrowded vehicles or driving without a license, it appears that the adolescents are more likely to be passengers than drivers when these circumstances are present.

A greater proportion of American high-school students ride a motorcycle or minibike (see above) than adolescents in this sample who had been on a motorbike as a passenger or a driver in the previous 12 months. This could reflect differences in access to motorbikes since the study involving dropouts was carried in a relatively socio-economically deprived neighbourhood.

A greater proportion of American school students had travelled in a vehicle with a driver who had used drugs or alcohol in the previous *month* than the youth in the study of Flisher and Chalton (1995) who had travelled in a motor vehicle knowing or strongly suspecting that the driver was affected by alcohol or cannabis in

the previous *year*. This could reflect one or both of: *(i)* a difference in the prevalence of driving under the influence of substances; and *(ii)* a difference in the prevalence of students choosing to travel in vehicles with a driver who has been using substances.

Even though the questions for helmet use and safety belt use are asked in different manners in the YRBS and the study by Flisher and Chalton (1995), it would appear that a similar proportion of students in the two populations place themselves at risk in terms of failure to use a helmet while on a motorbike. It is less easy to compare the responses for the seat belt use since it is known what proportion of the adolescents in the study of Flisher and Chalton (1995) who used a seat belt on the last eligible occasion always do so. The most one can conclude is that the prevalences in the two surveys are compatible with each other.

Gender

There were no consistent differences in the prevalences of the road-related behaviour according to gender. The differences that do exist are of dubious significance owing to the wide confidence intervals for the estimates.

2.2.6 Violent behaviour

There is consensus across the political spectrum that South Africa is a country that has been despoiled by widespread violence (Knottenbelt, 1989; Lee, 1992; McKendrick and Hoffmann, 1990a; Muckart, 1991; Van der Spuy and De Wet, 1991). Much of the interest in the topic of violence in South Africa has centred on political or public violence; Dawes calculated in 1994 that there were 48 reports in the South African psychological literature on the effects of political violence on children (Dawes, 1994). Notwithstanding the profound implications of political violence for the lives of South Africans, this review will not focus explicitly on political violence for the following reasons:

- there are several recent and/or thorough reviews in which this has been addressed (see, for example, Cock, 1990; Dawes, 1994; Duncan and Rock, 1994; Hirschowitz *et al.*, 1994; Silove and Schweitzer, 1993; Simpson, 1993);

- at the time that the field work for the project involving high-school students in the Cape Peninsula was carried out, there was not a significant amount of *overt* political violence taking place *in this region*;

- even though political violence is pervasive in South Africa, the incidence of criminal violence is substantially higher (Duncan and Rock, 1994) - indeed, Van der Spuy estimated in 1993 that close to 90% of violence in South Africa at that time was not related to political incidents and would not disappear once political consensus had been reached (Van der Spuy, 1993b).

a) Adverse outcomes

Victims of physical aggression and exposure to physical danger at night

The most extreme consequence of being the victim of physical aggression or (exposure to physical danger at night from which it can result) is death from assault.

An example of a country in which the incidence of homicide is high is the USA (WHO, 1993a). The overall annual homicide rate is 1,7 per 100 000 for those aged 10 to 14 years and 15,4 per 100 000 for those aged 15 to 24 years (Hammett *et al.*, 1992). However, these overall figures obscure important trends with respect to gender and race. The rates for black males aged 15 to 24 years are higher than those for the other age/race/gender groups; for black males aged 15 to 24 years the annual mortality rate for homicide was 101,8 per 100 000 (Hammett *et al.*, 1992), which is approximately nine times the rate for their white counterparts. Homicide is the leading cause of death among both black males and black females aged 15 to 34 years (Hammett *et al.*, 1992).

In addition, homicide rates increase markedly during adolescence; in the USA, the rates increase by a factor of 15, from 0,9 per 100 000 at age 10 to 13,9 per 100 000 by age 20 (Anonymous, 1990b, cited in O'Carroll *et al.*, 1993).

In South Africa, although other reports have documented mortality data for violence for South Africans of all age groups (Lester, 1989; Van der Merwe, 1990; Wyndham, 1980, 1986a,b), the only report focusing specifically on adolescents is that by Flisher *et al.* (1992)

(Table 2.24). This analysis revealed that in the 15 to 19-year age group, the extent of mortality from assault is highest among coloureds and blacks, followed by Asians and then whites. The mortality rate for coloureds is lower than that for blacks in the USA. Furthermore, for coloureds and blacks aged 15 to 19 years, assault is the leading cause of death (Flisher *et al.*, 1992).

Death from assault is the most extreme outcome of being the victim of an act of interpersonal violence. There is a dearth of published data regarding the epidemiology of non-fatal injury from interpersonal violence in South Africa for all age groups, including adolescents. However, some indication of the scope of the problem can be obtained from unpublished data.

Data for Cape Town's Groote Schuur Hospital was provided by Dr John Knottenbelt, who is the Head of the Trauma Unit at this hospital (Personal communication). In 1991, 1 787 adolescents aged 14 to 19 years presented at this unit for treatment of assault injuries. However, only three of these adolescents (that is, 0,17%) sustained injuries that turned out to be fatal. A proportion of these injuries (particularly those involving head and spinal cord injuries) can be expected to result in permanent physical, neurological, and psychosocial disabilities (O'Carroll *et al.*, 1993).

Table 2.24 Proportional assault mortality and assault mortality rates per 100 000 for adolescents in South Africa for each population and age group, 1984-1986 (Flisher et al., *1992).*

	10 - 14 years		15 to 19 years	
	Proportional mortality	Mortality rate	Proportional mortality	Mortality rate
Whites (N = 1 446)	7,5	1,8	5,9	5,2
Coloureds (N = 1 817)	9,3	4,0	47,1	62,2
Asians (N = 287)	6,3	1,7	14,4	11,1
Blacks (N= 5738)	11,3	*	44,1	*

* Mortality rates were not calculated for blacks owing to the poor quality of the data (Flisher *et al.*, 1992)

As mentioned in the section dealing with road-related behaviour above, the Cape Metropolitan Study, carried out by the National Trauma Research Programme of the Medical Research Council, includes patients presenting at other state hospitals and at private facilities (Strydom, 1994). Furthermore, it was reported above that for all injuries, only 0,9% of those aged 10 to 19 years died after their initial assessment by a health professional (Van der Spuy, personal communication). However, 29,3% of all the injuries to adolescents aged 10 to 19 years were due to violence. A similar conclusion as for road-related accidents also applies for injuries due to violence, *viz.* even if all the deaths were due to violence as opposed to other causes, this would still be a very small percentage of all adolescents presenting with injuries.

Table 2.25 indicates that of all injuries adolescents (defined as those aged 10 to 19 years), close to 30% were due to violence. Furthermore, almost 10% of all adolescents in the Cape Metropole were injured in episodes of interpersonal violence for which they required medical attention. It is impossible to compare this to the international experience owing to the absence of equivalent data sets. This point notwithstanding, the finding that this proportion of adolescents were injured to the extent of requiring medical attention indicates the importance of violence as a cause of morbidity in the Cape Metropole.

Table 2.25 Injuries due to violence, 1990, Cape Metropolitan Study, National Trauma Research Programme of the Medical Research Council (Van der Spuy, personal communication)

	Age group		
	10 to 14 years	15 to 19 years	All 10 to 19 years
Extrapolated number of injuries due to violence	2 092	10 899	12 991
Extrapolated total number of injuries	16 769	27 617	44 386
Percentage of injuries due to violence	12,5	39,5	29,3
Population in the Cape Metropolitan Area*	206 443	241 689	448 132
Percentage of population injured in episodes of violence	1,0	4,5	2,9

* The total population of the Cape Metropole in 1990 was 2,517 million (City of Cape Town Health Department, cited in Van der Spuy, personal communication). The estimates of population size are based on the age group profiles from the 1991 Census (Van der Spuy, personal communication)

The importance of violence as a cause of injury in the Cape Metropole is underlined by the mechanisms causing the injuries (Table 2.26). Almost two-thirds of injuries to adolescents were brought about by the use of sharp instruments. Clearly, sharp instruments have a greater potential to cause serious injury than many if the other instruments listed such as blunt instruments or fists.

Perpetrating acts of violence, vandalism, and weapon carrying

The perpetration of acts of violence or vandalism and weapon carrying can be associated with disruptive behaviour disorders such as conduct disorder or oppositional defiant disorder (American Psychiatric Association, 1994; Flisher *et al.*, 1995). (). One or both of these disorders can in turn be associated with various other features such as (American Psychiatric Association, 1994; Lewis, 1991; Rey, 1993; West, 1985; Wolff, 1985): *(i)* deficits in empathy; *(ii)* poor self esteem; *(iii)* poor frustration tolerance, irritability, temper outbursts, and recklessness; *(iv)* early onset of sexual behaviour, unplanned pregnancy, and sexually transmitted infections; *(v)* suicidal behaviour; *(vi)* lower than average intelligence and poor scholastic progress; *(vii)* substance misuse; and *(viii)* other mental disorders such as anxiety disorders and mood disorders. However, these cannot necessarily be considered as adverse effects of the violent behaviour *per se* since violent behaviour is not invariably associated with conduct disorder or oppositional defiant disorder. However, when the violent behaviour *does* comprise an aspect of conduct disorder or opposional defiant disorder, the above features can be regarded as being associated with the violent behaviour.

Table 2.26 Mechanisms used injuries of adolescents caused by violence, 1990, Cape Metropolitan Study of the National Trauma Research Programme of the Medical Research Council (Van der Spuy, personal communication)

Mechanism of violence	Age group					
	10 to 14 years		15 to 19 years*		All 10 to 19 years	
	N	(%)	N	(%)	N	(%)
Sharp instrument	986	(47,1)	7 430	(69,0)	8 416	(65,5)
Blunt instrument	600	(28,7)	1 730	(16,1)	2 330	(18,1)
Sharp and blunt	0		104	(0,8)	104	(0,8)
Fist, feet	312	(14,9)	744	(6,9)	1 056	(8,2)
Firearm	38	(1,8)	342	(3,2)	380	(3,0)
Human bite	0		131	(1,2)	131	(1,0)
Fall, pushed	26	(1,2)	105	(1,0)	131	(1,0)
Hot fluid	0		78	(0,7)	78	(0,6)
Other	130	(6,2)	105	(1,0)	35	(1,8)
Total	2 092	(100)	10 769	(100,0)	12 861	(100,0)

* Unknown in 130 cases

There are direct adverse consequences of perpetrating acts of violence or vandalism or weapon carrying. Clearly, the intent of perpetrating an act of violence is to place the victim at risk of physical injury. The behavior of the *perpetrator* is thus a risk behaviour for injury on the part of the *victim*. In addition, the possibility of retaliation places the perpetrator of an act of violence at risk for physical injury at the hands of the intended "victim".

In the case of weapon carrying, it could be argued that having a weapon in one's possession reduces the risk of injury from a physical fight since the weapon may be able to be used in self defence. However, there is evidence from studies involving domestic gun ownership in the USA that this may be a myth. Kellerman and his colleagues have shown that there is a greater probability that domestic firearms will be used on a family member or friend or in a suicide than on an intruder (Kellerman and Reay, 1986; Kellerman *et al.*, 1992). There are no comparable data for South Africa. Furthermore, it is possible that this may not apply to other types of weapons besides firearms. However, it does indicate that possession of a weapon cannot be assumed to be protective.

b) International prevalence studies

HBSC Study

In the HBSC Study, questions involving interpersonal violence were confined to the issue of bullying (King and Coles, 1992). These items were motivated by the work of Olweus (1991) who has

documented the epidemiology and sequalae of this behaviour in Norway. The questions referred to being "picked on". There are no items in the questionnaire used in the study described in this thesis that correspond directly to being "picked on"; the items that come closest to this refer to "physical injury". Notwithstanding this, selected results from the HBSC Study will be presented below since some of the trends may be relevant for physical injury.

There are two items referring to being picked on; one inquires about having been picked on and the other inquires about picking on others. Results from these items are presented in Tables 2.27 and 2.28.

YRBS

There were two items in the YRBS that are relevant to the study involving high-school students in the Cape Peninsula. These referred to involvement in physical fights and carrying a weapon such as a gun, knife, or club. It was found that 42,5% (95% CI: 40,2 - 44,8) of the students had been involved in at least one fight during the 12 months preceding the survey and 26,1% (95% CI: 24,0 - 28,2) had carried a weapon on at least one day during the previous 30 days (Kann *et al.*, 1993). Further details about the responses to these items are presented in Table 2.29.

*Table 2.27 Percentages of students who have been picked on at least once by age and gender, 1990, HBSC Study (King and Coles, 1992)**

Country	Age 11 years		Age 13 years		Age 15 years	
	Male	Female	Male	Female	Male	Female
Austria	56	54	70	63	74	61
Belgium	70	59	64	47	57	39
Canada	82	77	78	68	80	68
Finland	80	63	75	67	74	60
Hungary	72	63	79	75	86	73
Norway	64	54	54	44	48	38
Poland	**	**	73	63	75	67
Scotland	59	54	68	52	64	56

* Data are not available for all countries (King and Coles, 1992)
** Data are not available for Polish students aged 11 years

*Table 2.28 Percentages of students who have picked on someone else at least once by age and gender, 1990, HBSC Study (King and Coles, 1992)**

	Age 11 years		Age 13 years		Age 15 years	
Country	Male	Female	Male	Female	Male	Female
Austria	69	49	85	81	89	90
Belgium	74	58	70	51	76	58
Canada	76	60	82	72	83	66
Finland	78	70	81	66	83	60
Hungary	61	36	75	55	75	51
Norway	70	55	69	48	71	43
Poland	**	**	50	20	50	18
Scotland	70	58	76	63	78	59

* Data are not available for all countries (King and Coles, 1992)
** Data are not available for Polish students aged 11 years

Table 2.29 Physical fighting and weapon carrying among high-school students in the USA, 1991, YRBS (Kann et al., 1993)

Category	Been involved in a physical fight at least once in the previous 12 months		Carried a weapon at least once in the previous 30 days	
	%	95% confidence interval	%	95% confidence interval
Sex				
• Male	50,2	± 2,5	40,6	± 2,7
• Female	34,4	± 3,2	10,9	± 1,7
Grade				
• 9	50,5	± 3,2	27,5	± 3,4
• 10	43,1	± 4,2	26,8	± 3,0
• 11	43,0	± 3,3	29,0	± 2,4
• 12	33,9	± 3,8	21,3	± 2,5
Race or ethnicity				
• White	41,0	± 2,6	25,1	± 2,6
• Black	50,6	± 4,5	32,7	± 3,1
• Hispanic	41,3	± 4,8	25,8	± 4,6

The National Adolescent Student Health Survey (NASHS)

The NASHS (which was described briefly in the section dealing with road-related behaviour above) contained additional items regarding violent behaviour that are relevant for the study involving high-school students in the Cape Peninsula; these items related to being attacked and risk of victimisation (American School Health Association *et al.*, 1989). The percentages of the total sample that had been exposed in these manners in the previous year are as follows (American School Health Association *et al.*, 1989): *(i)* attacked at school - 13,0%; *(ii)* attacked outside of school - 16,4%; *(iii)* hitchhiked - 9,6; and *(iv)* walked alone late at night - 73,4%. A breakdown according to grade level and gender is provided in Table 2.30.

Comments and trends from the international studies

General

The results from the HBSC Study indicate that there is a large variation between countries in the prevalence of being picked on and picking on others. For the former item, the most extreme difference is that of 38% between 15-year-old boys in Hungary and their counterparts in Norway, while for the latter item the most extreme difference is that of 62% between 15-year-old girls in Austria and their counterparts in Poland. This supports a reluctance to make assumptions about the prevalence of violent behaviour in a specific context in the absence of empirical data.

Table 2.30 Behaviours related to interpersonal violence in the previous year, 1988, NASHS (American School Health Association, Association for the Advancement of Health Education, Society for Public Health Education Inc., 1989)

	Grade 8		Grade 10	
	Male	Female	Male	Female
Attacked at school	22,5	10,0	11,4	8,1
Attacked outside of school	22,6	11,5	18,5	12,3
Hitchhiked	8,9	5,8	13,1	9,9
Walked alone late at night	74,7	65,6	82,6	69,7

It also appears from the HBSC data that many of the countries for which there is a low prevalence of being picked on also have a low prevalence of picking on others, and *vice versa.* This is exemplified by Canada, in which relatively high percentages of students of both genders and all ages groups have both been picked on and picked on someone else. This would not be consistent with the higher prevalences of being picked on in certain countries being explained by a higher mean incidence of victimising

on the part of each youth comprising a minority of similar size as in countries with a lower prevalence.

Gender

For each of the behaviours mentioned above, and for each age or grade group and for each race/ethnic group, the prevalence was higher for boys than girls.

Age/grade group

The trends according to age group in the HBSC Study are not consistent.

In the YRBS there was a trend for the prevalence of being involved in a physical fight to decrease with grade. Furthermore, the prevalence for those in grade 12 was significantly lower than that of those in grades 9, 10, and 11. Although there was not a consistent pattern for the item involving carrying a weapon, the prevalence was lower for those in grade 12 compared to those in 9, 10, or 11 (Kann *et al.*, 1993). In the case of grades 9 and 11, this difference was statistically significant (Kann *et al.*, 1993).

In the NASHS, a substantial decrease with grade in the prevalence of being attacked at school and being attacked outside of school was observed for boys only; however, this decrease was less pronounced for boys who were attacked outside of school (American School Health Association *et al.*, 1989). For hitchhiking

and walking alone late at night, the converse trend was observed in that the prevalence increased from grade 8 to 10 for both genders (American School Health Association *et al.*, 1989).

A tentative summary of the above trends is as follows. Where trends do exist, there is a decrease in the prevalence of both being the victim of and perpetrating acts of violence with increasing age or grade. However, for behaviour exposing oneself to risk of injury there is an increase in prevalence with increasing age/grade.

Race/ethnicity

Data regarding race/ethnicity are available only for the YRBS study. Black students were more likely than white or Hispanic students to have been involved in a physical fight in the previous 12 months and to have carried a weapon in the previous 30 days. However, the only statistically significant differences were those between black students and white students (Kann *et al.*, 1993)

c) South African prevalence studies

There is a dearth of studies in which behaviour resulting in interpersonal violence is documented. There are several studies carried out by psychologists based at the Health Psychology Unit at the University of South Africa in which selected demographic and behavioural determinants of injuries due to interpersonal violence were investigated (Butchart and Brown, 1991; Butchart *et al.*, 1991a,b; Nell and Brown, 1990). However, in all these reports the analyses regarding behavioural determinants was

not stratified according to age and the results are thus not directly applicable to this literature review.

The only previous study addressing violent behaviour of South African adolescents involved teenage high-school dropouts in a working-class community in the Cape Peninsula (Flisher and Chalton, 1995). As for road-related behaviour, the results of this study are relevant for the behaviour of high-school students since the questionnaire items used in the study involving dropouts (Flisher and Chalton, 1995) are identical to those used in the project reported in this thesis involving high-school students (although the latter study included a greater number of items). The relevant results are presented in Table 2.31. The methodological aspects of the study by Flisher and Chalton (1995) that necessitate caution in extracting trends that were mentioned in the section dealing with road-related behaviour above are also applicable for interpersonal violence. These aspects notwithstanding, the following trends are detectable in the results presented in Table 2.31.

General

A substantial percentage of the students are involved with violent behaviour, either as perpetrators or victims. With the exception of the item involving causing serious damage to property outside of home or school, at least 13% of males had been physically hurt by an adult at home or somebody outside of home, or had themselves physically injured somebody outside of home or school, in the previous 12 months. Furthermore, as regards behaviour exposing oneself to danger in getting home at night, even larger numbers appear to be at risk (although the prevalence of hitchhiking in this context was relatively low).

Table 2.31 Percentages (with 95% confidence intervals) of teenage high-school dropouts in a working-class community in the Cape Peninsula involved in various forms of violent behaviour (Flisher and Chalton, 1995)

Behaviour	Males ($N = 28$)	Females ($N = 40$)	Total ($N = 68$)
Being physically hurt by an adult at home during the previous 12 months	13,5 (2,0 - 24,9)	0,0	5,3 (0,4 - 10,2)
Being physically injured by anybody outside of home in the previous 12 months	22,4 (8,4 - 36,5)	7,5 (0,0 - 15,2)	13,4 (6,0 - 20,8)
Physically injuring anybody outside of home or school in the previous 12 months	18,0 (5,0 - 30,9)	2,9 (0,0 - 7,8)	8,8 (2,6 - 15,0)
Causing serious damage to property outside of home or school in the previous 12 months	4,5 (0,0 - 11,5)	0,0	1,8 (0,0 - 4,6)
Going out at night beyond the neighbourhood without knowing how to get home in the previous 4 weeks	26,9 (12,0 - 41,9)	14,8 (4,5 - 25,1)	19,6 (10,9 - 28,3)
Going out at night beyond the neighbourhood and walking home alone in the previous 4 weeks	39,6 (23,3 - 56,1)	9,3 (0,9 - 17,8)	21,3 (12,3 - 30,2)
Going out at night beyond the neighbourhood and hitchhiking home in the previous 4 weeks	4,5 (0,0 - 11,5)	2,9 (0,0 - 7,8)	3,5 (0,0 - 7,6)

Gender

For each of the items, a greater percentage of males reported involvement in violent behaviour, both as victims and perpetrators. Even though the 95% confidence intervals overlap and the differences are in some cases not large, the *consistency* of the trend indicates that it is worth taking note of it. This trend is consistent with the data of the international studies cited above. Various explanations have been advanced to account for the greater involvement of males in interpersonal violence, including the following:

- biological factors (Shamsie, 1985);
- a greater propensity for risk taking (Hurrelmann, 1990);
- a higher prevalence of substance abuse and dependence (Kandel, 1993); and
- a tendency to act out hostile impulses owing to the process of socialisation - this may be particularly applicable in the South African context where relatively rigid definitions of maleness exist which may convey stereotyped images of power and dominance (Butchart *et al.*, 1991b; Segal and Labe, 1990).

It is not possible to comment on trends according to standard/age and race/ethnicity owing to an absence of data.

2.2.7 Sexual behaviour

Puberty, and the reawakened sexual drive with which it is associated, is often regarded as the starting point for adolescence and hence the transition to adulthood (WHO, 1993a). In many cultures, the onset of puberty is recognised by rituals and ceremonies after which young people are treated differently (WHO, 1993a). Specifically, they are more closely supervised when with members of the other gender. This reduces the probability of some of the adverse consequences of adolescent sexuality (WHO, 1993a). This review of adolescent sexual behaviour will commence with an exploration of these adverse effects.

a) Adverse outcomes

The most important consequences of risky sexual behaviour are unwanted pregnancy, HIV infection, and other sexually transmitted infections. Each of these consequences will be discussed separately.

Unwanted pregnancy

Prevalence

Unwanted adolescent pregnancy is a major public health concern throughout the world (WHO, 1993a). The USA is quoted as having the highest teenage pregnancy rate among the Western nations (Nash, 1990). In that country, each year more than one million adolescents become pregnant, and it is estimated that 87% of pregnancies among never-married adolescents are unintended (Henshaw and Van Vort, 1989; Morris *et al.*, 1993). Another way of

expressing the extent of adolescent pregnancies is by the proportion of all babies that are delivered of adolescent mothers. Using this criterion, it has been calculated that 13 % of all deliveries in the USA are to adolescent mothers (Henshaw and Van Vort, 1989; Preston-Whyte, 1991). In 1981 in both Canada and England and Wales, 8% of all deliveries were to girls aged 15 to 19 years while in the Netherlands the proportion was 2% (Preston-Whyte, 1991).

In the developing world, valid data regarding the prevalence of teenage pregnancy are not available for all countries. From the data which are available it would appear that there is a wide range in the prevalence of teenage pregnancy. The proportions of all deliveries that are to girls aged 15 to 19 years range from 21% in Bangladesh to 3% in China (Preston-Whyte, 1991). Taken as a region, it would appear that the region comprising sub-Saharan Africa has the highest prevalence of adolescent pregnancy compared to all other regions in the world (Barker and Rich, 1992). It has been estimated that between 15% and 20% of the births in this region are to teenage mothers (WHO, 1990).

In South Africa, the situation appears to be marginally less bleak, although still of much concern. The proportions of all births in 1985 that were to girls aged 15 to 19 years were 8%, 11%, and 7% for Asians, Coloureds, and whites respectively (Preston-Whyte, 1991). Reports of the Human Sciences Research Council provide inconsistent figures for blacks; according to one report, 8% of all births to blacks in 1985 were to girls aged 15 to 19 years (Preston-Whyte, 1991), while according to another 14% of all births to blacks in 1989 were to teenage girls (Boult and Cunningham, 1991). It is

possible that this discrepancy is accounted for by the former report not taking into account births in the TBVC territories.

There are some data that indicate that urbanisation status may be a predictor of the extent of teenage pregnancy. According to official statistics provided by the Transkei Department of Health, teenage girls constituted 25% of all women (almost all of whom were black) delivering in Transkei hospitals during 1986 and 1987 (Ncayiyana and Ter Haar, 1989). This estimate is of the same order of magnitude as the available data within two years for selected individual Transkei Hospitals; for example, the proportions of teenage girls delivering at St Barnabas Hospital in 1985, Dora Nginza Hospital in 1989, and Butterworth Hospital in 1988 were 26%, 20%, and 28% respectively (Mukasa, 1992; O'Mahony D, 1987; Van Wyngaardt, 1989). These figures for the predominantly rural Transkei are higher than the figure of 17.3% for all women in the Eastern Cape (Boult and Cunningham, 1991), which consists both of rural and urban areas. This figure is in turn higher than the proportion for all black births in South Africa (see above) and the figure of 14% reported by Van Coeverden De Groot (1986) for black women delivering in the Peninsula Maternal and Neonatal Service in Cape Town in 1981-1983.

Inspection of these figures reveals that urbanisation may be serving as a protective factor for teenage pregnancy among blacks. Clearly, further work is necessary to determine whether selection bias can account for this gradient. Thus, illegal abortions may be more common in urban areas; also, there may be a tendency for older rural women to migrate to the urban areas to deliver or, conversely, for urban adolescents to migrate to the rural areas for

this purpose. However, if it does indeed emerge that urbanisation is a protective factor, it would be necessary to determine which concomitants of the urbanisation process are operative.

Notwithstanding the possible impact of urbanisation on the prevalence of adolescent pregnancy, the figures quoted above indicate that teenage pregnancy is sufficiently common to render it a major concern from the point of view of the public health. This concern is amplified by the fact that the figures quoted above are underestimates of the extent of teenage pregnancies since abortions are not included. This aspect will now be addressed.

Abortions

In South Africa, terminations of pregnancy are legally performed only in terms of the provisions of the Abortion and Sterilisation Act of 1975 and its amendments (Department of Health, 1975, 1982). In 1987, there were 20 and 121 legal terminations of pregnancy for those aged 0 - 14 years and 15 - 19 years respectively (Department of National Health and Population Development, 1988, cited in Nash, 1990). A similar number go to the United Kingdom for legal terminations in that country (Bourne, 1988, cited in Nash, 1990).

Nash (1990) reviewed her experience of the 187 teenagers who were seen for psychiatric assessment since 1975 by the Pregnancy Advisory Service of Groote Schuur Hospital in Cape Town under the provisions of the Abortion and Sterilisation Act of 1975 and its amendments (Department of Health, 1975, 1982; Nash, 1990). Of

those referred, 42 (22,5%) had psychiatric disorders, the most common of which was mental handicap. Nash (1990) comments that the majority of the referred teenagers were sexually ignorant and that many were sexually active but unaware of the availability of contraceptives.

The sample in Nash's (1990) study is biased in that it includes only girls who were referred for an abortion under the provisions of the above legislation. It is impossible to obtain valid data regarding the number of "illegal" abortions, in other words, those not performed in terms of the provisions of this legislation. Katzenellenbogen *et al.* (1995) have pleaded for the quality of abortion data to be improved; they identify problems in terms of the motives for data collection (i.e. the data are not collected primarily for purposes of public health policy and practice but rather for policing purposes), the notification form itself, and the procedures for completing the form. Until this plea is heeded, it will be necessary to estimate the extent of illegal abortions from local data. At Baragwanath Hospital in Johannesburg, 300 women per month are seen with complications of illegal abortion (Orr, 1995). At King Edward VII Hospital in Durban, 1 817 abortions were performed in 1989, the bulk of these completing illegal incomplete abortions (Brooks *et al.*, 1995). There were 14 527 operations for the removal of residues of pregnancies of girls aged 15 - 19 years in 1987 (Department of National Health and Population Development, 1988, quoted in Nash, 1990). Although the official estimates for the number of illegal abortions in South Africa range between 42 000 and 167 000 per annum, it is believed by medical personnel treating women presenting with complications of illegal abortions that a more realistic estimate would be 200 000 per annum (Orr, 1995).

The implications of this estimate are far-reaching, especially when considering the possible adverse consequences of illegal abortions. The most immediate potential adverse consequence is death, usually from sepsis or haemorrhage (Flisher *et al.*, 1990). It has been estimated that the maternal mortality attributable to abortion varies between 21% and 35% in sub-Saharan Africa (Otsea, 1993, cited in Smith, 1995).

Those surviving an illegal abortion are at risk for the following consequences (Van Coeverden de Groot, 1991): *(i)* cervical laceration, with consequent incompetence of the internal cervical os and hence habitual abortions; *(ii)* pelvic inflammatory disease, with consequent infertility; and *(iii)* haemorrhage, with consequent anaemia.

In addition, although the teenager may be relieved that the "burden" of the pregnancy has been relieved, there are frequently feelings of loss, anger, guilt, and remorse. If these feelings are repressed, they may emerge later with magnified intensity (Nash, 1990).

The discussion above has focused on those pregnancies of adolescents that terminate prematurely. The outcomes for those pregnancies in which the adolescents do carry their pregnancy to term will now be addressed.

Other sequelae of adolescent pregnancy

It is frequently mentioned that pregnant adolescents are at risk for various adverse obstetric outcomes. The most significant of these include (Van Coeverden de Groot, 1991; WHO, 1975): *(i)* maternal mortality (Morris *et al.*, 1993; Van Coeverden de Groot, 1968); *(ii)* obstructed labour and obstetric fistulae (Strobino 1987); *(iii)* hypertensive disorders of pregnancy (including gestational proteinuric hypertension) (Strobino, 1987; Utian, 1967); *(iv)* miscarriages and stillbirths (Menken, 1980); and *(v)* premature labour (Fraser *et al.*, 1995; Utian, 1967).

Since 1980, there have been one descriptive study (Goldberg and Craig, 1983) and three case-control studies (Blumenthal *et al.*, 1982; Mukasa, 1992; Ncayiyana and Ter Haar, 1989) in which the question of the obstetrical outcome of pregnancies of black South African adolescent girls is addressed. Blumenthal *et al.* (1981) compared a group of 200 14 to 16-year-old Black obstetric patients with controls aged 20 to 23 years. They found a significantly higher incidence of occipitoposterior presentations in the teenage mothers, resulting in a higher rate of Caesarian Sections and assisted deliveries. The converse findings were reported in the other two studies using a case-control design. Ncayiyana and Ter Haar (1989) compared the obstetrical outcomes in 515 rural adolescents aged 16 years and younger with that of an equal number of matched rural women aged 20 to 29 years. They found no increases obstetric risk among the teenagers. Finally, Mukasa (1992) compared the outcome of pregnancy and labour in 601 primigravidas aged 19 years and younger with that of 221 primigravidas aged 21 to 25 years. He too found that there were

no significant differences between the two groups, although there was a non-significant trend for the perinatal mortality rate to be higher among the teenagers than among the older mothers.

The latter two studies conclude that teenagers are not at increased risk for obstetric complications on the grounds of the their age per se (Ncayiyana and Ter Haar, 1989). This conclusion is consistent with that of recent methodologically sound studies carried out in the USA (Horon *et al.*, 1983; Satin *et al.*, 1994) and Australia (Corey *et al.*, 1984) in which matched control groups were utilised (Ncayiyana and Ter Haar, 1989). It was suggested that the findings in other studies indicating that the incidence of obstetrical complications was disproportionately high in teenagers could be explained by suboptimal antenatal care, premature surgical intervention, and less well-controlled vaginal births because of the behaviour of the adolescent during labour (Ncayiyana and Ter Haar, 1989). However, a recent study involving 134 088 girls and women aged 13 to 24 years who delivered in Utah, USA, found that younger girls had a worse obstetrical outcome in terms of birthweight, prematurity, and size for gestational age even when the influence of the quality of antenatal care was taken into account (Fraser *et al.*, 1995).

The above comments indicate that consensus has not been achieved regarding the obstetrical outcome of pregnancies of adolescent mothers (Davis, 1989). However, there is no disagreement that teenage pregnancy has serious adverse economic, social, and psychological sequelae (Friedman and Edström, 1983; Gillis, 1990). Education and employment opportunities are adversely affected (WHO, 1993a). Social

sanctions and stigma may exert a negative influence on self-esteem and mood (WHO, 1993a). There may be a choice between single parenthood and premature marriage (with a resulting increased probability of marital conflict or divorce) (WHO, 1975, 1993a). In addition, women who have borne their first children in adolescence are likely to conceive again sooner than those who first conceived in their twenties. Related to this is the observation that earlier pregnancy is associated with large families (Roberts and Rip, 1984; St John, 1982; WHO, 1993a). The long-term sequelae of adolescent pregnancy have been investigated in the USA where it has been found that teenage mothers are more likely to be single, poorly educated, and poor in their future lives than their counterparts who did not become pregnant (Forrest, 1994; Goldenberg and Klerman, 1995). Finally, adolescent single motherhood places burdens on the mother at a time when she is almost a child herself; for this reason, much of the burden of caring for the child and the adolescent mother falls on the extended family and society at large (Anonymous, 1990a; Foster, 1986).

There is only one quantitative study in which the impact of pregnancy on South African adolescents is documented. In a study by O'Mahony (1987), 30 rural black schoolgirls delivering at St Barnabus Hospital in the Transkei were interviewed. Of these schoolgirls, schooling was disrupted by the pregnancy in 24 cases, although all of them planned to continue with their schooling. Furthermore, in almost all cases the parents were angry and disappointed, and twenty-five of the families wanted compensation from the family of the father of the child. These responses on the part of the families indicates that premarital pregnancy is not a

social norm. However, the fathers tended to be supportive in that 25 expressed an interest in caring for their children.

Only one of the girls in O'Mahony's sample did want to become pregnant. Several quantitative studies carried out in the Western Cape (Du Toit, 1990, cited in Preston-Whyte, 1991) and two communities in Natal (Allen and Preston-Whyte, 1990, cited in Preston-Whyte, 1991; Preston-Whyte and Louw, 1986; Preston-Whyte and Zondi, 1991) have investigated the attitudes both of pregnant adolescents and their families to the pregnancy (Preston-Whyte, 1991).

Certain common findings emerged in all three contexts; for example, *(i)* there was a positive value attached to birth and motherhood whether inside or outside marriage; and *(ii)* there was an accommodation and acceptance of extramarital births in the family and household (Preston-Whyte, 1991). In the Coloured communities studied in the Western Cape (Du Toit, 1990, cited in Preston-Whyte, 1991) and Natal (Allen and Preston-Whyte, 1990, cited in Preston-Whyte, 1991), teenage pregnancy was perceived as virtually inevitable. When a teenager becomes pregnant, parents are initially upset and angry but eventually accommodate to the baby. In the black community studied in Natal, recriminations generally cease once the baby is born and, as in the Coloured communities studied, the children are generally valued by the families (Preston-Whyte and Zondi, 1991). Furthermore, there are considerable advantages for the adolescents concerned as regards a pregnancy; for example, the girl has proof of her fertility and the boy of his potency (Preston-Whyte and Zondi, 1991). The attitudes revealed by these findings may mitigate some of the adverse consequences of adolescent

pregnancy mentioned above. However, their main impact should be to inform pregnancy prevention efforts as opposed to diminishing their importance.

HIV infection

Since 1980, the HIV epidemic has emerged as one of the most serious threats not only to the health but also the social, economic and psychological and well-being of the global public. In 1994, the WHO estimated that there had been 17 million HIV-infected people since the beginning of the epidemic (The Argus, Cape Town, 1 July 1994). Moreover, it was estimated that by the year 2 000 this estimate would increase to 30 to 40 million people (The Argus, Cape Town, 1 July 1994). The developing world, and specifically sub-Saharan Africa, accounts for a disproportionate fraction of these cases (Schopper, 1990).

In South Africa, the epidemiology of AIDS was initially dominated by cases in the white homosexual community (Schoub *et al.*, 1990). Since the first report of AIDS in a black heterosexual person in 1987, there has been increasing emphasis on the heterosexual AIDS epidemic in South Africa, which affects predominantly black male and female urban populations (Schoub *et al.*, 1990).

Barriers to the production of valid estimates of the prevalence of HIV infection in South Africa (Abdool Karim, 1991; Everatt and Milner, 1994; Keir, 1990) have resulted in the application of a variety of statistical approaches (Doyle, 1990, cited in Groeneveld and Padayachee, 1992; Groeneveld and Padayachee, 1992;

Padayachee and Groeneveld, 1992; Padayachee and Schall, 1990;. Schall, 1990). The stochastic modeling process used by Groeneveld and Padayachee (1992) produced estimates for new HIV cases and cumulative HIV cases in 1995 of 297 311 and 762 394 respectively. For the year 2 000, the corresponding figures were 1 583 722 and 5 664 489 respectively (Groeneveld and Padayachee, 1992). This implies that 29% of the black adult population will be infected by the year 2000, which is similar to the findings of Doyle (1990, cited in Groeneveld and Padayachee, 1992) and Schall (1990).

As for the population in general, there are no valid HIV prevalence data for adolescents (Friedman and Robertson, 1990). However, some indication of the scope of the problem is provided by the HIV prevalence among pregnant teenagers in October/November 1993 as revealed by the national survey among women attending antenatal clinics (Epidemiological Comments, 1994, cited in Mitchell, 1994). It was reported that the prevalence among teenagers was 4,6%; with the prevalence for those in the 20 to 24-year and 25 to 29-year age groups being 6,1% and 5,2% respectively (Epidemiological Comments, 1994, cited in Mitchell, 1994). Because the median duration of the incubation period is about 10 years, it is probable that many of those identified with HIV infection in their twenties were infected while in their teens (Morris *et al.*, 1993). Furthermore, the overwhelming majority of South African teenagers who become infected by the HIV virus do so by means of heterosexual intercourse (Ijsselmuiden *et al.*, 1988b).

From the biological point of view, adolescents are at risk for sexually transmitted diseases for two reasons (Morris *et al.*, 1993): *(i)* their immune system is relatively unchallenged; and *(ii)* during adolescence columnar epithelium is more prevalent on the cervix than during adulthood, and certain infections such as chlamydia and gonorrhoea are more likely to be transmitted in this environment. Indeed, studies in many parts of the world have indicated that the prevalence of sexually transmitted diseases is relatively high in adolescents. The highest rates for sexually transmitted infections are generally in the 20 to 24-year age group, followed by the 15 to 19 and 25 to 29-year age groups (WHO, 1993a). In the international literature, besides HIV infection, the most common sexually transmitted infections are chlamydia, gonorrhoea, syphilis, chancroid, and herpes simplex virus infection (Morris *et al.*, 1993). There are no estimates based on community probability samples of the incidence of other sexually transmitted infections in South African adolescents. However, 14 of the 225 (7%) patients aged 15 - 24 years who attended six randomly selected day hospitals in the Cape Peninsula on one day were diagnosed as having sexually transmitted infections (including gonorrhoea, syphilis, chancroid, pelvic inflammatory disease, and vulvo-vaginitis or vaginitis) (Roberts *et al.*, 1991).

Sexually transmitted infections have an importance beyond the immediate discomfort and unpleasantness provided by their symptoms. HIV transmission is potentiated by the co-occurrence of other sexually transmitted infections (Wilson and Lavelle, 1992). The converse can also occur, with HIV infection facilitating infection

by other sexually transmitted agents by means of impaired immune system function, and a cycle of reciprocal amplification can be set in motion (Wilson and Lavelle, 1992). Other long-term sequelae of sexually transmitted infections include (WHO, 1993a): *(i)* infertility and ectopic pregnancy (from pelvic inflammatory disease); *(ii)* carcinoma, for example of the cervix, penis, and anus (from human papilloma virus infection); and *(iii)* perinatal transmission to children.

b) International prevalence studies

In this section, the focus will be on those aspects of sexual behaviour that are included in the project in which risk behaviour of high-school students in the Cape Peninsula is examined.

The HBSC Study did not include questions about sexual behaviour among the core questions. However, the researchers responsible for the HBSC survey carried out in Belgium did include items regarding sexual behaviour in their survey. However, the study was confined to the French-speaking community of Belgium and the results are thus not generalisable to all adolescents in Belgium (Piette *et al.*, 1993). Furthermore, details of the study have not been published in English (Piette *et al.*, 1994). For these reasons, it was decided not to include this study in this review.

The only study with a national sample of school students in which sexual behaviour was investigated is the *Canada Youth and AIDS Study* (King *et al.*, 1988, 1989). The pertinent results of this study will be presented, as well as those of the YRBS carried out in the USA.

Canada Youth and AIDS Study (CYAS)

An aim of the CYAS was to document the knowledge, attitudes, and behaviour of Canadian youth with respect to AIDS and other sexually transmitted infections among young people in high school. A sample representative of each of the ten provinces and two territories comprising Canada was obtained by a cluster sampling strategy. There were approximately 10 000 students in the sample from each of grades 7, 9, and 11. The age range of the sampled students was 12 to 18 years.

The results from the only item that is directly relevant to the study involving high-school students in the Cape Peninsula are presented in Table 2.32. It can be seen that almost 50% of the grade 11 students had participated in sexual intercourse at least once.

Table 2.32 Percentages of students who have had sexual intercourse, Canada Youth and AIDS Study (King et al., *1992)*

	Grade 9		Grade 11	
	Males	Females	Males	Females
Once	11	6	9	7
A few times	13	9	24	18
Often	7	6	16	21

The YRBS

In the 1991 YRBS carried out in the USA (CDC, 1991d, 1992c), 54,1% (95% CI: 51,1 - 57,1) reported having participated in sexual intercourse (Table 2.33) and 18,7% (95% CI: 16,8 - 20,6) had four or more partners during their lifetime. Of those students who had participated in sexual intercourse, 69,3% (95% CI: 67,2 - 81,4) had done so during the three months preceding the survey.

Some of the findings regarding contraceptive use are presented in Table 2.34. Overall, 81,8% (95% CI: 79,0 - 84,2) had used a contraceptive method (for example, oral contraceptive, condom, or withdrawal) on their most recent coital episode, and 46,2% (95% CI: 43,1 - 49,3) had used a condom on their most recent coital episode.

General comments about the international studies

- Although the proportion of students who had participated in sexual intercourse was relatively high in both the USA and Canada, the proportion appears to be somewhat higher in the USA.

- In both samples, males were more likely to have experienced sexual intercourse, and the proportion of students who had done so increased with increasing grade.

Table 2.33 Sexual intercourse among high-school students in the USA, 1991, YRBS (Kann et al., *1993)*

Category	Ever had sexual intercourse	
	%	95% confidence interval
Sex		
• Male	57,4	± 3,6
• Female	50,8	± 3,4
Grade		
• 9	39,0	± 3,5
• 10	48,2	± 5,4
• 11	62,4	± 3,4
• 12	66,7	± 4,0
Race or ethnicity		
• White	50,0	± 3,2
• Black	81,5	± 3,0
• Hispanic	53,1	± 4,4

Table 2.34 Contraception and condom use among currently sexually active high-school students in the USA, 1991, YRBS (Kann et al., *1993)**

Category	Used a contraceptive method on the most recent coital episode		Used a condom on the most recent coital episode	
	%	95% confidence interval	%	95% confidence interval
Sex				
• Male	83,0	± 2,9	54,6	± 3,5
• Female	80,8	± 2,6	38,0	± 4,2
Grade				
• 9	72,9	± 8,1	53,3	± 6,0
• 10	81,8	± 3,4	46,3	± 4,5
• 11	82,9	± 3,8	48,7	± 5,8
• 12	84,9	± 2,6	41,6	± 3,7
Race or ethnicity				
• White	86,2	± 1,9	46,6	± 4,4
• Black	74,2	± 4,9	48,0	± 4,0
• Hispanic	71,4	± 5,5	37,6	± 5,5

* Sexually active is defined as those students reporting sexual intercourse during the three months preceding the survey, among students who had ever had sexual intercourse.

- In the US sample, black students were significantly more likely than white or Hispanic students to have experienced sexual intercourse (Kann *et al.*, 1993).

- Data regarding contraception use are available for school students in the US only. There were no differences between the genders for using any contraceptive method, but male students were more likely to have used a condom than their female counterparts. Use of any contraceptive method increased significantly from the 9th to the 12th grade (Kann *et al.*, 1993). However, students in grade 9 were significantly more likely to have used a condom than those in grade 12 (Kann *et al.*, 1993). The percentages for grades 10 and 11 were intermediate between these two values although the order was not preserved. Again, there were significant differences between the racial/ethnic groups for contraceptive use. White students were more likely than black or Hispanic students to have used a contraceptive method on their last coital episode, and also more likely to have used a condom than their Hispanic counterparts (Kann *et al.*, 1993).

c) South African prevalence studies

The studies in which the prevalence of selected aspects of the sexual behaviour of subgroups of South African adolescents is provided are tabulated in Table 2.35. Only those behaviours that have some relevance for the aspects of sexual behaviour included in the study involving risk behaviour of Cape Peninsula high-school students that forms the basis of this thesis are included.

Table 2.35 South African studies in which the prevalence of various aspects of sexual behaviour is examined

Reference	Education status of population	Sampling strategy	Sample size	Sex	School standards or ages	Population groups	Criterion	Prevalence
Amod and Shmukler, 1985	Students at 4 high schools in Jo'burg	Cluster	200	Both	Std 9	Indian	Ever had coitus	Males: 48% Females: 4%
							≤ 16 yrs at 1st coitus	Males: 81% Females: 75%
							Had ≥ 2 partners	Males: 69 Females: 25
Boult and Cunningham, 1991	Pregnant girls < 18 at 2 Port Elizabeth hospitals	Total popula-tion	145	Fe-male	Range: 12 - 17 yrs Mean: 16 yrs	Black	Age at first coitus	≤ 14: 38%: 15: 40% >15, ≤ 17: 20% Mean: 14,7 years
							# partners	1: % 65,5 2-3: 34,4% ≥ 4: 2,1%
							Contra-ceptive use	Always: 7% Sometimes: 25% Never: 68%

Flisher and Chalton, 1995	High-school dropouts	Random	68	Both	Mean: 17,7 yrs	Coloured	Ever had coitus	Males: Females:	32,9% (95% CI: 17,1-48,7) 35,2% (95% CI: 21,3-49,1)
							Not knowing partner for > 7d	Males: Females:	31,8% (95% CI: 4,5-59,1) 0,0
							Not using contra-ception	Males: Females	45,2 (95% CI: 16,2-74,7) 50,3 (95% CI: 25,9-74,8)
Friedland *et al.*, 1991	Witwaters-rand Univ. residents	Random	120	Both	Mean age: 21	Not stated	Ever had coitus	Males: Females:	71 54
							# partners in the past 6 m	1: ≥ 2:	45% (95% CI: 35,4 - 54,4) 16% (95% CI: 9,1-22,9)
							Used a condom in the past 6 m	26%	

Kau, 1988	School students in the Molopo Region of Bophutha-tswana	Cluster	210	Fe-male	Range: 13 - 18 yrs Mean: 15,2 yrs.	Black	Ever had coitus	48,1%
							Age at first coitus	Mean: 14,9 years Median: 16 years
							Current # partners	(Of the non-virgins) 1 partner: 88,1% 2 partners: 11,9%
							Use contra-ception	(Of the non-virgins) 30,7%
Kau, 1991	High schools in one region of Bophut-hatswana	Random	200	Male	Range: 13 - 18 yrs (78,5 % were aged 15 - 18 yrs)	Black	Ever had coitus	78%
							Age at first coitus	11: 7% 15: 13% 12: 19% 16: 14% 13: 5% 17: 3% 14: 14% 18: 5%

Mathews *et al.*, 1990	Black high schools in Cape Town	Cluster	377	Both	< 18: 57% of sample ≥ 18: 43% of sample	Black		Males		Females	
								<18	≥18	<18	≥18
							Ever had coitus	86	92	54	91
							# partners in past 10 m:				
							• 0	14	6	5	12
							• 1	47	50	45	74
							• 2-3	11	24	4	5
							• ≥ 4	14	12	0	0
							Ever used a condom	11,4			
Roberts, undated	Attenders at Family Planning Centre	Random	353	Both - but 10% male	≤ 19: 67% > 19: 33% Mode and median = 19 yrs	White: 74% Coloured: 18% African: 5%	Always used contra-ception	55%			
							Use of specific methods by those using any contraception	Condom: 14% With-drawal: 21% Rhythm: 1%			

Van Coeverden de Groot and Greathead, 1987	Sexually active attenders at Family Planning Clinic	All attenders in 6 mo. period	215	Fe-male	Not stated	White	Age at first coitus	< 17: 17 - 19: > 19:	45% 48% 7%

Given the potentially catastrophic consequences of much adolescent sexual behaviour, the paltry number of studies addressing the epidemiology of this behaviour is striking. This may reflect the relatively weak influence that public health priorities have on the research programme of South African investigators (Parry *et al.*, 1992a,b). In addition, there are specific difficulties associated with research into sexual behaviour. Not only may education authorities deny access to school students for the purpose of gathering data regarding sexual behaviour, but there may be opposition from the parents of the students and even the students themselves. It is possible that the urgency accompanying the HIV epidemic will result in wider recognition of the necessity of valid data regarding the sexual behaviour of South African adolescents.

Some general comments about the studies involving the sexual behaviour of South African adolescents (Table 2.35) are provided below.

- Several of the studies included in Table 2.35 have sampling frames defined by some aspect of sexual behaviour or its sequelae, for example attendance at a family planning centre (Roberts, undated; Van Coeverden de Groot and Greathead, 1987) and presentation at a hospital following pregnancy (Boult and Cunningham, 1991). Clearly, the adolescents comprising these samples are not representative of adolescents in the community.

- For many of the studies listed in Table 2.35, the principle objective was not to gather data regarding sexual behaviour *per se*. The focus of Boult and Cunningham (1991) was on the social and medical factors associated with pregnancy among black teenagers; Roberts (undated) and Van Coeverden de

Groot and Greathead (1987) aimed to document some specific features of the adolescents attending particular family planning facilities, and both Friedland *et al.* (1991) and Mathews *et al.* (1990) conducted their studies with the main aim of gathering data relevant for the prevention of HIV infection. In these studies, the data regarding sexual behaviour was a by product of the process necessary to achieve the principal objectives. As a consequence of this, the data regarding sexual behaviour are not very extensive or detailed.

- All the studies are concerned with populations consisting of specific subgroups of adolescents defined by gender, age or school standard, population group, and geographical site.

- The key variables are defined in different ways which renders it more difficult for the results of the studies in Table 2.35 to be compared with each other, with those of previous studies carried out in other countries, and with those of the project involving risk behaviour of Cape Peninsula high-school students that forms the main subject of this thesis.

- there was no attention devoted to any aspects of homosexual behaviour or to anal intercourse in any of the studies enumerated in Table 2.35. Although these aspects are clearly not relevant for pregnancy, they are relevant for sexually transmitted infections (especially HIV infection). It is necessary to gather data regarding homosexual behaviour and anal intercourse if one is to avoid an incomplete impression of the epidemiology of risky sexual behaviour.

The results of the previous South African studies (Table 2.35) will not be discussed under the headings for the demographic features of gender, school standard/age, and language(s) spoken at home/population group (as for the other forms of risk behaviour). Rather, the findings will be discussed under headings corresponding to the various aspects of sexual behaviour. Comments regarding trends according to the demographic features mentioned above will be made in the context of each aspect of sexual behaviour. In addition, these trends will be related to trends revealed in the North American studies mentioned above.

Lifetime prevalence of sexual intercourse

This aspect is obviously not relevant for the studies involving pregnant adolescents (Boult and Cunningham, 1991) or those attending family planning facilities (Roberts, undated; Van Coeverden de Groot and Greathead, 1987).

The lifetime prevalence of sexual intercourse varies considerably according to study and gender; the range is from 4% for female Indian Standard 9 students in Johannesburg (Amod and Shmukler, 1985) to 92% for male black students aged 18 years and older in Cape Town (Mathews *et al.*, 1990).

There may be a tendency for the lifetime prevalence of sexual intercourse to be higher for black school students than Asian or Coloured adolescents; for example, for males, the proportion of black students who had experienced sexual intercourse was 78% in Bophuthatswana (Kau, 1991) and (for those aged less than 18 years) 86% in Cape Town (Mathews *et al.*, 1990), compared to

48% for Indian boys in Johannesburg (Amod and Shmukler, 1985) and 33% for Coloured high-school dropouts in Cape Town (Flisher and Chalton, 1995). The dropouts were significantly more likely to have had sexual intercourse than their counterparts who had not dropped out of school (Flisher and Chalton, 1995), which implies that the gradient between the lifetime prevalence of sexual intercourse of black and Coloured students is even more steep if Coloured students still attending school are included in the comparison. For females, a similar trend obtains, except that the prevalence for Indian girls is relatively lower.

In the NYBS carried out in the USA in 1991, Black youth were more likely to have experienced sexual intercourse than white or Hispanic youth (Table 2.35) (Kann *et al.* 1993). It is unlikely that these discrepancies are due to differences in the age structures of the population. Not only is there no reason to think that the age structures of the samples mentioned in Table 2.35 are substantially different from each other (especially since the gradient is valid for those aged less than 18 years in the sample of Mathews *et al.* (1990), but the differences are relatively large. However, the methodological aspects mentioned above make it necessary to regard these conclusions with some caution. A study carried out among students of various population groups at the same time in the same place using the same instrument is necessary to provide methodologically sound evidence for any differences that may exist.

Many of the studies enumerated in Table 2.35 did not have samples consisting of both males and females. The studies by Amod and Shmukler (1985), Friedland *et al.* (1991), and, for those

less than 18 years of age, Mathews *et al.* (1990) indicated that there may be a tendency for male students to be more likely to have had sexual intercourse than their female counterparts. In the Youth Risk Behaviour Survey (Kann *et al.*, 1993) carried out in the USA in 1991, there was a trend for males to be more likely to have had sexual intercourse; however, the 95% confidence intervals overlapped so this finding should be regarded with some caution (Kann *et al.*, 1993).

The trend for males to be more likely to have had sexual intercourse was not present in the study by Flisher and Chalton (1995) among high-school dropouts in Cape Town. This finding cannot be explained by girls dropping out of school because of pregnancy since only two of the sample dropped out of school for this reason (Flisher and Chalton, 1995).

Amod and Shmukler (1985) attribute their finding of a very low prevalence of sexual intercourse among females by ascribing it to the constraints imposed on female sexual behaviour in the Indian community. They believe that the low prevalence reflects traditional values in which virginity and modesty in females are stressed (Amod and Shmukler, 1985). It is possible that socially determined sex roles are also relevant in explaining the differences in the prevalence of sexual intercourse where they are detected in the other studies as well. However, it is not clear why these putative factors should not be applicable to the dropout sample as well.

In only one study was the lifetime prevalence of sexual intercourse examined in relation to age. Mathews *et al.* (1990) found that the

proportion of students in their sample who had participated in sexual intercourse increased substantially for the age group ≥ 18 years in relation to the age group < 18 years for females whereas the increase was minimal for males. In the Youth Risk Behaviour Survey (Kann *et al.*, 1993) carried out in the USA in 1991, there was an increase in the lifetime prevalence of sexual intercourse with each grade, which is to be expected.

Age at first coitus

Three of the South African studies involving sexual behaviour of adolescents included the variable of age at first coitus. Although the age categories varied between these studies, it would appear that for those who had commenced sexual intercourse, the lowest reported percentage who had commenced intercourse by the age of 17 years was 45% for white girls attending a family planning clinic in Cape Town (Van Coeverden de Groot and Greathead, 1987). The vast majority of the non-virgins in the school-based studies had commenced intercourse by the age of 17 years (Amod and Shmukler, 1985; Kau, 1991).

These figures can be misleading since they obviously apply only to adolescents who had already experienced intercourse. This will result in an underestimate of the age of first intercourse for all sexually active adults since the age of first intercourse for those that commence intercourse at a later age will tend to increase the mean age of coital debut for adults.

In the Youth Risk Behaviour Survey carried out in the USA in 1991, the investigators did not inquire about age at first intercourse, although 39,0% of the total sample had participated in intercourse by the time they were in grade 9.

Number of sexual partners

This variable was included in four of the South African studies involving adolescent sexual behaviour (Amod and Shmukler, 1985; Boult and Cunningham, 1991; Friedland *et al.*, 1991; Mathews *et al.*, 1990)(Table 2.35). In all these studies, the proportion of students who had multiple partners was low. This was examined in relation to gender in two studies, viz. those of Amod and Shmukler (1985) and Mathews *et al.* (1990) among high-school students at Indian and black high-school students respectively. In these studies, there was a tendency for males to report more sexual partners than females, which is consistent with the Youth Risk Behaviour Survey carried out in the USA in 1991 (Kann *et al.*, 1993).

Use of contraceptives

Kau (1991) asked the boys in her sample whether they had discussed contraception with their partners, and found that 23% had done so. It is difficult to attach any significance to this finding since the content of the discussions is not available and she did not inquire about actual behaviour regarding contraceptives. Roberts (undated) found that 55% of her sample always used

contraceptives, but her sample was confined to adolescents attending a family planning clinic. The converse bias is present in Boult and Cunningham's (1991) study since all their subjects were pregnant. Friedland *et al.* (1991) found that 26% of their sample of university students had used a condom in the previous 6 months, although no data were provided in terms of the frequency of condom use. Only one study involving South African school students included an item involving contraceptive use. Mathews *et al.* (1990) reported that only 11,4% of the non-virgins in their sample had ever used a condom. This is considerably less than the percentage of students in the USA who used a condom on their most recent coital episode; in the YRBS, it was reported that 46,2% of sexually active students had used a condom on their most recent coital episode (Kann *et al.*, 1993).

There were other items included in the survey among Cape Peninsula high-school students for which it was not possible to unearth comparative data from recent, comprehensive, and methodologically adequate previous studies. These include whether the partner on the last coital episode was known for more than seven days, the number of weeks since the last coital episode, and heterosexual and (for males) homosexual anal intercourse. These results will thus be interpreted without reference to previous research.

2.3 INTERRELATIONSHIPS BETWEEN RISK BEHAVIOURS

Thus far, this review has been concerned with the descriptive epidemiology of various individual risk behaviours. This section moves beyond descriptive epidemiology to focus on the *interrelationships* between risk behaviours.

This section of the review will commence with a description of the *syndrome* of adolescent risk behaviour, which refers to the concept whereby there is *covariation* between each of a cluster of specific risk behaviours. Thereafter, I shall review the evidence for including specific additional behaviours in the syndrome; although these behaviours are not generally included, there is some evidence supporting their inclusion.

2.3.1 The syndrome of adolescent risk behaviour

In 1977, Richard and Shirley Jessor published their book entitled *Problem Behavior and Psychosocial Development. A Longitudinal Study of Youth* (Jessor and Jessor, 1977). This book contained the first detailed exposition of Problem-Behavior Theory, which remains the most developed and comprehensive theory of adolescent risk behaviour. In addition, they provided a large amount of empirical data in support of this theory. This review will not focus on Problem-Behavior Theory specifically nor on the prevalences of risk behaviours but rather on the interrelationships between risk behaviours that were documented as part of the process of validating the theory.

The book by Jessor and Jessor (1977) was based on two analogous studies, named the *High School Study* and the *College Study*. Although additional information about these studies is provided in Table 2.36, they will be described in some detail below owing to their considerable impact on the field of adolescent risk behaviour.

- The **high-school** study employed a cohort-sequential (Schaie, 1965) longitudinal design, wherein cohorts born in three successive years were followed simultaneously over a sequence of four annual testings. A 75% random sample (stratified by sex and grade level) of 1 126 students was drawn in grades 7, 8, and 9 in Year 1. Of these, 589 took part in the Year 1 testing; the remaining students were excluded owing to denial of parental or personal permission. Of these 589 subjects, 483 (82%) were still in the study by the end of the Year 4 testing, and of these 432 participated in all four years of testing. The findings to be presented below are based on this sample of 432 students, demographic details of whom are provided in Table 2.36.

- The **College Study** employed a simple longitudinal design, wherein cohorts of male and female first-year college students were followed for four annual testings. A 10% random sample (stratified by sex) of 497 students in the College of Arts and Sciences was selected. Of these, 462 were still at College at the time the project commenced and, of these, 276 (60% of those available) consented to participate in the study. Of these 276 subjects, 226 (83%) were still in the study by the end of the Year 4 testing, and of these 205 participated in all four years of testing. As for the High School Study, the findings to be

presented below are based on this sample of 205 students, demographic details of which are provided in Table 2.36.

Jessor and Jessor (1977) provide detailed data regarding the prevalence of various forms of risk behaviour, but these data will not be reviewed owing to the existence of findings from recent and more representative samples of youth in the USA, for example, the 1991 Youth Risk Behavior Survey (Kann *et al.*, 1993). Of more relevance are the interrelationships between risk behaviours. More specifically, Jessor and Jessor (1977) studied the interrelationships between the following risk behaviours:

- *drinking*, that is having had a drink of beer, wine, or liquor (not just a sip or a taste) on more than two or three occasions;

- *problem drinking*, defined by having been drunk on five or more occasions and/or having experienced negative consequences of alcohol use in two or more life areas (for example, problems with friends, difficulties at school, criticism on dates, trouble with family, drinking and driving, and trouble with the police);

- having ever used *marijuana*;

- being a *nonvirgin*;

- high *general deviance* defined by being in the top 35% of the high- school sample or 40% of the college sample with respect to the frequency of illegal or antinormative activities such as lying, cheating, stealing, aggression, and vandalism; and

Table 2.36 Studies by Richard Jessor and his colleagues regarding the syndrome of adolescent risk behaviour (in chronological order in terms of year of publication)

Reference	Population	Sample	N	Demographic breakdown of sample	Design and analytic strategy	Relationships reported (~ indicates that the behaviours are significantly related to each other)
Jessor and Jessor, 1977	Students in grades 7 - 9 four years previously	Random, stratified by sex and grade level	483	*Gender:* • male - 44% • female - 45% *Race/ethnicity:* • white - 89% • Chicano - 4%	Cohort-sequential (Schaie, 1965), but cross-sectional data used for the results displayed in the Table; χ^2 - tests and scalar properties	Marijuana use ~ problem drinking ~ having experienced intercourse ~ high general deviance (including lying, stealing, aggression, vandalism)
Jessor and Jessor, 1977	First-year college students four years previously	Random, stratified by sex	205	*Gender:* • male - 45% • female - 55%	Longitudinal; but cross-sectional data used for the results displayed in the Table; χ^2 - tests and scalar properties	Marijuana use ~ problem drinking for males and having experienced intercourse and high general deviance for females; problem drinking ~ high general deviance for both genders; all other pairs of behaviours are not significantly related to each other.

Jessor *et al.*, 1980a; Donovan and Jessor, 1978	7th to 12th grade students in the 48 con-tiguous states and the DC	Stratified random	10 405	*Gender:* • male - 48% • female - 52% *Race/ethnicity:* • Caucasian - 69% • Hispanic - 12% • Native Am - 6%	Cross-sectional survey; Pearson correlations	Involvement with marijuana or problem drinking ~ general deviant behaviour, times drunk in the past year, other illicit drug use
Donovan and Jessor, 1985	Students in grade 7 three and four years previously (Note: separate analyses were done for the same sample in two successive years)	Random, stratified by sex	243	*Gender:* • male - 42% • female - 58%	Cross-sectional survey; Pearson correlation coefficients	Times drunk in the past year ~ frequency of marijuana use in the previous 6 months ~ frequency of sexual experience ~ general deviant behaviour in the past year **EXCEPT** for women for one year for frequency of marijuana use in the previous 6 months and: • times drunk in the past year; and • frequency of sexual experience.

Donovan and Jessor, 1985	First year college students three and four years previously (Note: separate analyses were done for the same sample in two successive years)	Random, stratified by sex	184	*Gender:* • male - 42% • female - 58%	Cross-sectional survey; Pearson correlation coefficients	Times drunk in the past year ~ frequency of marijuana use in the previous 6 months ~ frequency of sexual experience ~ general deviant behaviour in the past year EXCEPT for • frequency of marijuana use in the previous 6 months and times drunk in the previous year for women for both years; • frequency of marijuana use in the previous 6 months and frequency of sexual experience for men in the first year; • times drunk in the previous year and frequency of sexual intercourse for men for both years; and • general deviant behaviour in the previous year and frequency of marijuana use in the previous 6 months
Jessor *et al.* (1980b) and Rachal *et al.* (1980), quoted in Jessor, 1987a	11th and 12th graders in US Schools	Not stated	2 654	*Gender:* • male - 46% • female - 54%	Cross-sectional survey; Pearson correlations	Number of cigarettes smoked per day in the previous month ~ times drunk in the previous year ~ frequency of marijuana use in the previous 6 months; number of other illicit drugs ever used; general deviant behaviour in the previous year.

- being an *activist*, defined by engaging in militant activism (attempting to secure social change or opposing current policies by interfering with the system and even committing illegal acts) and/or peaceful demonstrations (nonviolent marches and public expression of demands for policy change). The inclusion of this item should be understood in the context of the 60's and early 70's in the USA. There was considerable concern about the opposition of large segments of American youth not only to the war in Vietnam but also to many established norms and institutions. Being an activist, along with drug use and sexual permissiveness, constituted the triad that was thought to characterise the youth movement or the "counterculture" (Jessor and Jessor, 1977).

Jessor and Jessor (1977) investigated the interrelatedness by two complementary methods, *viz.* conducting χ^2 - tests to assess whether those who engage in one risk behaviour are significantly more likely to engage in each of the others, and by examining the psychometric properties of an additive scale based upon the separate behaviour statuses.

Using the former method, they found that for the High School Study there were significant relationships between the behaviours enumerated above for both males and females except for being an activist for which the relationships were in most cases not significant. For the College Study, the results were not as clear or consistent in that the relationships between the behaviours were significant for selected behaviours only (see Table 2.36 for details). However, for those relationships for which significant relationships were demonstrated in the High School Study, the

direction of the relationships in the College Study was in the expected direction. It could thus be argued that there was a *trend* for the behaviours to be related to each other.

This conclusion was supported by the psychometric properties of an additive scale based upon the separate behaviour statuses. This scale, entitled the "multiple problem behaviour index" (MPBI), is an equally weighted summative index comprised of five component dichotomous items referring to five of the behaviours listed above (drinking was omitted since almost all of the college participants replied affirmatively to this item). In the High School Study, the homogeneity ratios and internal consistencies were acceptable for both genders; the homogeneity ratio was 0,30 for males and 0,28 for females and Cronbach's alpha was 0,67 for males and 0,65 for females. The item-total score correlations were satisfactory for all items except for activism; the correlations for activism were 0,17 for males and 0,15 for females whereas they ranged from 0,38 to 0,59 for the other items for both genders. In the College Study, the scalar properties were of borderline acceptability for both genders; the homogeneity ratio was 0,12 for males and 0,17 for females and Cronbach's alpha was 0,41 for males and 0,50 for females. The item-total score correlations were lower for activism than for the other items for each gender; the correlations for activism were 0,11 for males and 0,19 for females in comparison to the ranges 0,18 to 0,30 for males and 0,25 to 0,39 for females.

Besides the finding that the pattern of inter-relationships was not as convincing in the College Study compared to the High School Study, there are some characteristics of the work of Jessor and Jessor (1977) that necessitate caution in generalising the findings. These include the following:

- there was a relatively large amount of initial attrition in both samples (even though the attrition subsequent to the initial testing was modest); and

- the sample consisted predominantly of middle-class whites attending educational facilities in one city.

These methodological limitations comprised part of the rationale for additional studies by Richard Jessor and other members of his group in which the significant interrelationships between some of the risk behaviours were replicated in other samples. In addition, they included other behaviours for which there was a commonsensical basis for their inclusion in a syndrome of adolescent risk behaviour such as cigarette smoking and the use of illicit drugs other than cannabis. Some details about some of these studies can be found in Table 2.37. Briefly, in a sample of over 10 000 high school students from 48 states and the District of Columbia in the USA marijuana use or involvement with problem drinking was found to be correlated with general deviant behaviour, the number of times drunk in the previous year, and other illicit drug use (Jessor *et al.*, 1980a; Donovan and Jessor, 1978). In another national sample, in this case involving only 11th and 12th graders, there were significant correlations between all possible pairs of variables involving cigarette smoking, being drunk, marijuana use, other illicit drugs, and deviant behaviour in the previous year (Jessor *et al.*, 1980b and Rachal *et al.*, 1980, cited in Jessor, 1987).

Since the publication of the work of Jessor and Jessor (1977), numerous researchers not associated with Jessor have documented statistically significant relationships between one or more pairs of the following

domains of risk behaviour: problem drinking, use of marijuana and other illicit drugs, having had sexual intercourse or engaging in one or more forms of sexual risk behaviour, general deviance (as defined by Jessor and Jessor, 1977). Table 2.37 summarises some of the studies published since 1980 in which these relationships have been demonstrated.

It has been decided to focus the rest of this review on studies published since 1980 because the bulk of the work reported in these reports would have been carried out since the publication of the work of Jessor and Jessor (1977) and the introduction of the notion of a syndrome of adolescent risk behaviour into the literature. However, there were publications prior to 1980 in which significant relationships between one or more pairs of behaviours comprising the syndrome of adolescent risk behaviour were established; for example, the following publications prior to 1980 show that alcohol use, cigarette smoking, marijuana use, and the use of other illicit drugs are correlated among each other: Block and Goodman (1978); Johnson (1973); Johnston (1973); Single *et al.*, 1974; Weitman *et al.*, 1972; and Zucker and Devoe (1975) (Donovan and Jessor, 1985).

Table 2.37 Studies supporting the concept of a syndrome of adolescent risk behaviour

Reference	Population	Sample	N	Demographic breakdown of sample	Design and analytic strategy	Relationships reported (~ indicates that the behaviours are significantly related to each other)
Adelekan *et al.*, 1993	Students at one Nigerian university	Not stated	636	*Gender:* • male - 69% • female - 30% *Age:* • 11-20 - 28% • 21-30 - 68% • 31-40 - 4%	Cross-sectional survey; χ^2-tests	Lifetime alcohol use ~ lifetime cannabis use ~ lifetime cigarette use
Choquet and Manfredi, 1992	High- and vocational-school students in Arras (France)	Stratified random	4 255	*Gender:* • male - 52% • female - 48%	Cross-sectional survey; χ^2-tests and logistic regression (with age, absenteeism and the other risk behaviours serving as independent variables)	Lifetime prevalence of sexual intercourse ~ regular alcohol consumption, lifetime prevalence of drunkenness, cigarette smoking, and (for those aged ≥ 15 yrs) lifetime illicit drug use

Donovan and Jessor, 1985	Students in grades 10 to 12 in the 48 contiguous states and the DC	Stratified, cluster	4 918	*Gender:* • male - 46% • female - 54% *Race/ethnicity:* • white - 72% • black - 10%	Cross-sectional survey; Pearson correlation coefficients	Number of cigarettes smoked per day in the previous month ~ times drunk in the past year ~ frequency of marijuana use in the previous 6 months ~ number of other illicit drugs ever used ~ general deviant behaviour in the previous year (all valid for males and females)
Finlayson *et al.*, 1987; Rob *et al.*, 1990 (Note: each publication reports overlapping aspects of the same study)	Students in grades 7, 10, and 11 at 7 high schools in Sydney, Australia	Cluster	1 270	*Gender:* • male - 46% • female - 54% *Grade:* • yr 7 - 37% • yr 8 - 36% • yr 9 - 27%	Cross-sectional survey; χ^2 - tests	Ever used marijuana ~ smoke cigarettes, have got drunk, drank alcohol 3+ times in past month, drank alcohol 3+ times in past week, have used hallucinogens, have used narcotics, have used stimulants, have had "full" sexual intercourse
					Stepwise multiple regression	smoke cigarettes ~ ever having had "full" intercourse; had "full" intercourse ~ amount of alcohol consumed; frequency of marijuana use ~ had "full" intercourse (Note: all of these applied to selected grades only)

Fullilove *et al.*, 1993	15 - 19-year old black teenagers in San Francisco	Street-based and network strategies	338	*Age:* $M = 17$ yrs. *Gender:* • male - 57% • female - 43%	Cross-sectional survey; χ^2 - tests	Use of crack ~ various sexual risk behaviours, lifetime use of alcohol, lifetime use of marijuana, lifetime use of cocaine
					As above, but with stepwise logistic regression analysis (the dependent variable was participating in one or more sexual risk behaviours)	Engaging in one or more sexual risk behaviours
Gillmore *et al.*, 1992	Unmarried pregnant adoles-cents aged ≤ 17 yrs in a large metro-politan area of the Northwest in the USA	Recruited	241	*Age:* 12 - 17 yrs; median = 16 yrs *Race/ethnicity:* • white - 51% • black - 32%	Cross-sectional survey; Pearson correlation coefficients	Risky sexual behaviour ~ ever engaged in delinquent activities ~ cigarette smoking ~ alcohol use ~ use of illicit drugs

					As above; multiple linear regression	Risky sexual behaviour ~ ever engaged in delinquent activities
Hundleby *et al.*, 1982	9th grade students at a Roman Catholic high school and a public high school in Ontario	Not stated	170	-	Cross-sectional survey; factor analysis followed by Pearson correlation coefficients	6-month prevalence of alcohol use *and* 6-month prevalence of tobacco use *and* 6-month prevalence of marijuana use ~ **each** of the following factors: • sexual behaviour • general delinquency
Hingson *et al.*, 1990	16 to 19-year- olds in Massa-chusetts	Random digit dialing (one adolescent randomly selected from each household)	1 773		Cross-sectional survey; χ^2 - tests	Not using condoms ~ drinking ≥ 5 drinks daily, smoking marijuana at least weekly, using other psychoactive drugs in the previous month
					As above; stepwise logistic regression	Not using condoms ~ drinking ≥ 5 drinks daily, using marijuana in the previous month

Kleinman *et al.*, 1988	High school students attending a NY City high school attending a drug abuse prevention program	Whole population	903	*Gender:* • male - 36% • female - 64% *Race/ethnicity:* "overwhelmingly white" *Grade:* • 9th - 20% • 10th - 27% • 11th - 28% • 12th - 25%	Cross-sectional survey; Pearson correlation coefficients	Lifetime cigarette smoking ~ lifetime multiple drug use ~ self-drunkenness ~ lifetime marijuana use
Murstein *et al.*, 1989	College students at a New England liberal arts college	Random, proportional to 4 college-year levels	642 (347 in 1974 and 295 in 1986; results in this Table are for both cohorts)	*Gender:* • male - 48% • female - 51% *Race/ethnicity:* In '74: all white In '86: 94% "	Cross-sectional survey; *t*-tests	Having experienced sexual intercourse ~ use of marijuana, use of heroin, use of other hard drugs, use of liquor, use of beer

Newcomb and McGee, 1991	Partici-pants in follow-ups of a prospec-tive study of adolescent growth and develop-ment	Not stated	595	*Gender:* • male - 30% • female - 70% *Race/ethnicity:* • black - 14% • Hisp - 13% • white - 64% • Asian - 9% *Grade:* • 10th - 45% • 11th - 35% • 12th - 20% •	Prospective , but cross-sectional data only relevant for this Table; Pearson correlation coefficients	Licit drug use (cigarettes and alcohol) ~ illicit drug use (cannabis and hard drugs) ~ sexual events (e.g. falling in love, breaking up with a boy- or girlfriend, losing virginity) ~ deviance events
Plant *et al.*, 1984	15- and 16-year-old students at five secondary schools in the Lothian Region, Scotland	? whole population	1 036	*Gender:* • male - 47% • female - 53%	Cross-sectional survey; stepwise multiple regression	**For males:** Serious consequences of alcohol use ~ having used cannabis, having used cocaine, having used amphetamines **For females:** serious consequences of alcohol use were *not* significantly associated with any of the above substance-related variables

Sylbing and Persoon, 1985	People aged 15 to 24 years in the Nether-lands	Proba-bility sample for household survey	1 306	Not provided	Cross-sectional survey; descriptive statistics only	Current cannabis use ~ lifetime use of tobacco, alcohol, other illicit drugs
Tamir *et al.*, 1982	Students in the last 3 years of secondary school in Haifa, Israel	? population	804	*Gender:* • male - 54% • female - 46% *Age:* • 16 - 37% • 17 - 33% • 18 - 30%	Cross-sectional survey; χ^2-tests	Currently smoking ~ had experienced sexual intercourse Marijuana use ~ had experienced sexual intercourse, current cigarette smoking, use of alcohol
Torabi *et al.*, 1993	Grade 5 - 12 students in Indiana	Stratified, cluster	20 629	*Gender:* M = F *Grades:* • 5 to 8 - 40% • 9 to 12 - 60%	Cross-sectional survey; χ^2-tests	Cigarette smoking ~ use of alcohol, marijuana, and various illicit drugs in the previous year (Note: there was a dose-response relationship in that the proportion of students using each of the substances increased with the number of cigarettes smoked)
Valois *et al.*, 1993	High-school students in South Carolina	Stratified	2 299	*Grades:* • 11th - 51% • 12th -49% *Gender:* • male - 48% • female - 52% •	Cross-sectional survey; simple logistic regression adjusted for race and gender	Fights resulting in injury requiring medical care ~ alcohol use, binge drinking, illicit drug use, being sexually active. Carrying weapons to school ~ alcohol use, binge drinking, illicit drug use, being sexually active.

Vander-schmidt *et al.*, 1993	Grade 6 to 8 students at 4 inner-city high schools in Boston	Whole population	1 420	*Grades:* • 6 th - 33% • 7th - 36% • 8th - 30% *Gender:* • male - 50% • female - 50% *Race/ethnicity:* • black - 65% • Hispanic - 24% • other whites - 8%	Cross-sectional survey	34% of the sample reported more than one of the following current risk behaviours: physical fighting or carrying a knife or gun; sexually active; drank alcohol at least once in the previous month; used at least 1 illicit drug at least once in the previous month; and smoked at least 4 cigarettes in the previous month. Among those reporting at least two risk behaviours, 94% included violence and 85% included sexual activity. Further data are not provided.
Zabin *et al.*, 1986	2 junior and 2 senior high schools in Baltimore, MD.	Whole population	2 557	*Gender:* • male - 36% • female - 58% *Race/ethnicity:* • white - 36% • black - 64%	Cross-sectional survey; stepwise multiple regression	Sexual activity ~ substance use (as indicated by an index grading the frequency of substance use and the substances used) (controlling for age, race, and gender)
Zastowny *et al.*, 1993	Teenagers in central locations (e.g. shopping malls)	Quotas in 100 primary sampling units in the USA	1 384	Not stated	Cross-sectional survey; multiple least-squares regression	Ever having used marijuana ~ cigarette smoking, alcohol use

The robustness of the findings regarding the relationships between the pairs of risk behaviours mentioned above is partly derived from the diverse characteristics of the relevant studies. This is exemplified by the large number of countries in which they have been carried out. Besides several studies in the USA (Fullilove *et al.*, 1993; Gillmore *et al.*, 1992; Hingson *et al.*, 1990; Kleinman *et al.*, 1988; Newcomb and McGee, 1991; Torabi *et al.*, 1993; Zabin *et al.*, 1986; and Zastowny *et al.*, 1993), studies carried out in the following countries have provided evidence for the existence of a syndrome of adolescent risk behaviour by demonstrating relationships between subsets of the risk behaviours mentioned above: Canada (Hindleby *et al.*, 1982); Nigeria (Adelekan *et al.*, 1993); France (Choquet and Manfredi, 1992); Australia (Finlayson *et al.*, 1987; Rob *et al.*, 1990), Scotland (Plant *et al.*, 1984), and the Netherlands (Sylbing and Persoon, 1985). The *sampling strategies* have varied; while the majority of the studies enumerated in Table 2.37 used stratified and/or cluster strategies to draw samples from students attending tertiary educational establishments, others used less conventional approaches in sampling less accessible populations; for example, Gillmore *et al.* (1992) used advertising and other methods to recruit pregnant teenagers from prenatal clinics, public school alternative programmes, and social service agencies and Fullilove *et al.* (1993) used street-based and network techniques to access their sample of black crack-abusing teenagers in San Francisco. Finally, a range of *analytic strategies* was employed; while χ^2 - tests and Pearson correlation coefficients were used in the majority of studies, multivariate techniques such as logistic and multiple regression were also used (Table 2.37).

There is thus a substantial body of research providing evidence for the existence of a *syndrome* of adolescent risk behaviour. The existence of this syndrome has important implications; for example, it indicates that

concern with individual forms of risk behaviour should be replaced by a perspective that suggests "a more comprehensive and simultaneous concern with the entire array of adolescent risk behaviors and promotes efforts to understand and alter the circumstances that give rise to and sustain such clusters or syndromes of risk behavior in adolescence" (Jessor, 1991, p 599). Further implications of the existence of a syndrome of adolescent risk behaviour will be mentioned in the Discussion of this thesis.

In this context, it is necessary to investigate whether this notion of a syndrome of adolescent risk behaviour is valid for high-school students in South Africa. The only study in Table 2.37 that was carried out in the developing world involved Nigerian students at one university and was concerned with three facets of substance misuse only. There are only two studies in which relationships between risk behaviours of South African adolescents could be unearthed. Van Coeverden de Groot and Greathead (1987) studied the relationship between cigarette smoking and sexual behaviour in their sample of white teenagers attending a Teenage Clinic of the Western Cape Region of the Family Planning Association. They found that 62% of the teenagers who were sexually active smoked as opposed to 38% of those who were not sexually active. Furthermore, there was an effect of age of first intercourse on cigarette smoking. If this occurred before the age of 17 years, 72% smoked whereas if the first episode of coitus occurred after 19 years the figure decreased to 19% (Van Coeverden de Groot and Greathead, 1987). However, their sample was highly selected; not only was it restricted to white females, but they had all attended a Teenage Clinic. The other study in which interrelationships between behaviours of South African adolescents were documented was by (Disler, 1990). She found that there were significant bivariate relationships between dagga smoking and cigarette smoking,

sexual intercourse and cigarette smoking, and dagga smoking and sexual intercourse for both genders. However, the implications of these findings are limited by the small number of behaviours studied and the non-representative nature of her sample (which consisted almost entirely of white, Jewish students of relatively high social class.

One cannot make the assumption that the relationships documented in the international studies mentioned above would also be applicable in the South African context. Not only may publication bias have resulted in studies in which covariation is not demonstrated not being published, but there is some indication that these relationships may be subject to substantial cultural variation (Fortenberry, 1995). Stanton *et al.* (1993) found that for their sample of inner city African-American adolescents initiation of sexual activity was not conceptualised as being among, nor necessarily associated with, other problem behaviours. However, other sources report that the patterns of covariation of African Americans are similar to whites and Hispanics in the USA (Farrell *et al.*, 1992; Fortenberry, 1995). There is thus uncertainty about the appropriateness of including sexual activity (for which there is robust evidence supporting its inclusion in the syndrome of adolescent risk behaviour) in this syndrome for a substantial demographic subgroup in the USA (where many of the studies documenting a syndrome of adolescent risk behaviour have been carried out). This uncertainty indicates that it is necessary to establish that the syndrome of adolescent risk behaviour is valid in the Cape Peninsula, and that the components of the syndrome are equivalent in the Cape Peninsula compared to other contexts.

All the behaviours mentioned above are components of the original syndrome of adolescent risk behaviour as developed by Richard Jessor and his colleagues (Table 2.36). Although (as described above) not all of

the relevant studies have provided evidence that all these behaviours are significantly associated with each other for all subgroups of adolescents, a consensus has emerged in the past decade that these risk behaviours do indeed tend to covary (Aarø et al., 1995; Jessor, 1991; Nutbeam et al., 1991; WHO, 1993a).

A further development has been work indicating significant relationships between one or more of the behaviours comprising the original syndrome of adolescent risk behaviour and: *(i)* suicidal behavior; and *(ii)* behaviour exposing oneself to injury. The obvious implication of this work is that these risk behaviours could also be considered as components of the syndrome of adolescent risk behaviour. Each of these aspects will now be reviewed.

2.3.2 Suicidal behaviour as a possible component of the syndrome of adolescent risk behaviour

The prevalence and adverse effects of suicidal behaviour have been reviewed in Section 2.2.1 above. What did not receive attention are the disappointing results revealed by the few controlled investigations of the effectiveness of prevention programmes (Shaffer *et al.*, 1988). There is even some suggestion that suicide prevention programmes can have negative consequences, for example increasing the number of teenagers who indicate that suicide *could* be a possible solution to problems! (Shaffer *et al.*, 1991). One strategy that has been proposed in the face of these findings is to screen adolescents at risk for suicide during programmes dealing with emotional problems of a more general nature. Furthermore, it has been proposed that programmes that place little direct

emphasis on suicide would be less likely to have adverse consequences (Shaffer *et al.*, 1991).

If it can be confirmed that suicidal behaviour comprises part of the syndrome of adolescent risk behaviour, this would be directly relevant to these suggestions. Not only would screening be facilitated, but intervention programmes could focus on other behaviours comprising the syndrome thus reducing the probability of the possible negative consequences of suicide intervention programmes (if these do in fact exist) (Shaffer, 1993).

Increased rates of disruptive and substance abuse disorders have been documented in both adolescent suicide attempters (Hawton *et al.*, 1982; Spirito *et al.*, 1989; Trautman *et al.*, 1991) and completers (Brent *et al.*, 1988; Fowler *et al.*, 1986; Rich *et al.*, 1986; Shaffer *et al.*, in press; Shaffi *et al.*, 1985). However, this does not necessarily indicate that suicidality comprises a component of the syndrome of adolescent risk behaviour for the following reasons.

- The suicidal adolescents in the studies cited above are not necessarily representative of suicidal adolescents in the community. There is a dearth of data comparing suicide completers with attempters (Shaffer and Piancentini, 1994). One study found that the two groups differed in terms of suicidal intent and psychopathology (Brent et al., 1991), while another found that certain subgroups of attempters may be more similar to suicide completers than others (Brent, 1987, cited in Shaffer and Piancentini, 1994). However, even the findings for suicide attempters may not be applicable to suicide attempters in general since these findings are derived from clinic samples as

opposed to community probability samples, and (as mentioned in the section dealing with suicidal behaviour above) only a minority of suicide attempters receive the attention of health care providers. A literature search revealed *no* studies in the world literature in which adolescent suicide attempters who present to health care facilities are compared with those who do not.

- Even though relationships between suicidal behaviour and (on the other hand) disruptive disorders and substance use disorders have been established, this does not indicate that there is necessarily a relationship between suicidal behaviour and what Jessor and Jessor (1977) call "general deviance" or (in the latter case) substance use. The criteria for a diagnosis of a disruptive disorder or substance abuse are considerably more stringent than the definitions of the risk behaviours used in the studies involving the syndrome of adolescent risk behaviour. It is possible that the relationship between suicidal attempts and, say, cannabis abuse would be attenuated or no longer attain statistical significance if the more lenient criterion of ever having used cannabis is used as opposed to the diagnosis of cannabis abuse.

What is the evidence for including suicidal behaviour in the syndrome of adolescent risk behaviour? Some of the relevant studies are included in Table 2.38. Many of the findings reported in this table provide additional support for the original syndrome of adolescent risk behaviour as described by Jessor and Jessor (1977). However, in order to keep the focus on suicidal behaviour, the implications of the studies in Table 2.38

for the original syndrome of adolescent risk behaviour will *not* receive attention in this review.

A statistically significant relationship between suicidal ideation and/or behaviour and one or more components of the original syndrome of adolescent risk behaviour would support its inclusion in the syndrome. Some of the studies documenting such a relationship are enumerated in Table 2.38.

These studies in Table 2.38 can be divided into two broad groups. One group includes studies in which statistically significant relationships are demonstrated between suicidal behaviour and one of the risk behaviours in the original syndrome of adolescent risk behaviour **but** the findings are not interpreted in the context of this syndrome. This is exemplified by the following studies, in which there were no explicit comments about the syndrome of adolescent risk behaviour; however, relationships were demonstrated between suicidal behaviour and delinquent behaviour (Berman and Schwartz, 1990; Goldberg, 1981) and drug and alcohol use (Choquet and Menke, 1989; Dukes and Lorch, 1989; Grossman *et al.*, 1991; Levy and Deykin, 1989; Swanson *et al.*, 1992; Workman and Beer, 1990). As Table 2.38 suggests, the results of some of these studies should be generalised with considerable caution owing to the samples being drawn from relatively unrepresentative subgroups of adolescents such as specific subgroups (Grossman *et al.*, 1991) or those enrolled in drug abuse treatment facilities (Berman and Schwartz, 1990) or a particular high school (Workman and Beer, 1990).

Table 2.38 Studies indicating that suicidal behaviour should be included in the syndrome of adolescent risk behaviour as defined by Jessor and Jessor (1977)

Reference	Population	Sample	N	Demographic breakdown of sample	Design and analytic strategy	Relationships reported (~ indicates that the behaviours are significantly related to each other)
Berman and Schwartz, 1990	Enrollees in 4 out-patient drug abuse treatment facility over a 4-month period	Whole population	340	*Gender:* • male - 66% • female - 34% *Age:* 13 to 19 yrs, median = 16.2 yrs *Race/ethnicity:* white - 93%	Cross-sectional survey and case control; χ^2 - tests	Suicide attempts ~ drug abuse
Choquet and Menke, 1989	Students aged 13 to 16 years living near Paris	Cluster	1601	*Gender:* • male - 56% • female - 44% *School level:* • jun HS - 71% • vocational school - 24% • remedial - 5% •	Cross-sectional survey; χ^2 - tests	Suicidal thoughts often ~ tobacco use, regular alcohol use, drunkenness ≥ 3 times per year, illegal drugs, various delinquent behaviours (running away, stealing outside the home and from parents, racketeering)(Many of these relationships are significant for rare suicidal thoughts)

Dukes and Lorch, 1989	High-school students in one US city	Whole population	9 752	7th to 12 th grade.	Cross-sectional survey; multiple regression	Alcohol use ~ suicide ideation
Garrison *et al.*, 1993	Public high-school students in South Carolina	Stratified cluster	3 764	*Grades:* • 9th - 26% • 10th - 29% • 11th - 23% • 12th - 23% *Gender:* • male - 45% • female - 55% *Race/ethnicity:* • white - 62% • black - 38%	Cross-sectional survey; stepwise logistic regression, adjusted for race and gender.	• Suicide Plans and attempts requiring medical care ~ aggressive behaviors, cigarette smoking, illicit drug use. • Suicide plans and attempts requiring medical attention ~ alcohol use. (Note: variables regarding suicidality refer to the previous 12 months)
Goldberg, 1981	Young adults in Washington County, Md., and Kansas City, Mo.	Commun. Proba-bility sample	489	*Gender:* • male - 42% • female - 58% *Age:* • 18-20 - 17% • 21-22 - 27% • 23-24 - 36% *Race/ethnicity:* all white except for 39 blacks	Cross-sectional survey; multiple regression adjusted for place/race, age, sex, education, occupational status, and marital status	One month prevalence of suicidal ideation ~ overt aggression in the previous week (as assessed by a scale with 3 points to items involving getting angry, getting into an argument with a friend, and getting onto a fight)

Grossman *et al.*, 1991	High-school students in the Nevajo Reservation in Alaska	All students in schools that volun-teered	7 241	*Gender:* • male - 49% • female - 49% *Age:* median = 14,4 yrs *Grade:* median = grade 9	Cross-sectional survey; logistic regression	Suicide attempts ever ~ weekly use of hard liquor (Note: weekly use of beer or wine did not serve as a risk factor for lifetime prevalence of suicide attempts)
Levy and Deykin, 1989	College students in Boston	Not stated	424	*Gender:* • male - 36% • female - 64% *Age:* • 18 - 19 - 94% *Race/ethnicity:* • Caucasian - 94%	Cross-sectional survey; Mantel-Haenszel summary odds ratio	Substance abuse diagnosis ~ thoughts of death, suicidal ideation, suicide attempts (all in the past 2 weeks)

Orpinas *et al.*, 1995	9th and 11th graders in one school district in Texas	Whole population	2 075	*Gender:* • male - 47% • female - 53% *Grade:* • 9th - 57% • 11th - 43% *Race/ethnicity:* • white - 83% • black - 5% • Hispanic - 9% • other - 4%	Cross-sectional survey; correlation coefficients and (for males) Mantel-Haenszel odds ratios	Fighting in the previous year **and** carrying a weapon in the previous month (vs. neither) ~ drinking alcohol on 6 or more days in the previous month; having 5 or more drinks in a row on 3 or more days in the previous month; smoking cigarettes in the previous month; smoking marijuana in the previous month; ever having used steroids; having had sexual intercourse; seriously considering attempting suicide in the previous year; actually attempting suicide in the previous year (Note: many of these relationships were significant for fighting only in the previous year and for weapon carrying only on the previous month, with the referent group in each case being no fighting and no weapon carrying)
					Multiple logistic regression including demographic variables and all the above risk behaviours except those involving inebriation, steroid use and suicidal attempts	Fighting in the previous year and carrying a weapon in the previous month (vs. neither) ~ # days drunk alcohol in the previous month, # sexual partners, presence of suicidal thought sin the previous year (above note applies to the multiple logistic regression as well)

Sosin *et al.*, 1995	US high-school students	3-stage cluster	11 631			Cross-sectional survey; logistic regression (for significance of trend)	Fighting with at least 1 participant requiring medical treatment during the previous 30 days ~ suicide attempt in the previous 12 months, firearm carrying in the previous 30 days, cocaine use during the previous 30 days, multiple sex partners in the previous 3 months, condom nonuse on the last coital episode
Swanson *et al.*, 1992	High-school students at 3 Mexican and 3 US border cities	Cluster	4 157			Cross-sectional survey; logistic regression adjusted for country, gender, socio-economic status, and depression	Suicidal ideation for at least 1 day of the previous week ~ using drugs in the previous month

	US	*Mexico*
Girls		
12-14	303	734
Boys		
12-14	243	666
Girls		
15-17	632	394
Boys		
15-17	577	506

Swanson *et al.*, 1992 (continued)					Cross-sectional survey; multi-variate logistic regression adjusted for race, gender, other risk behaviours, and self-perceived academic ability	Fights resulting in injury requiring medical care ~ binge drinking, illicit drug use, being sexually active. Carrying weapons to school ~ binge drinking, illicit drug use, being sexually active.
Velez and Cohen, 1988	Children of child caretakers in two upstate counties of New York State	Random, stratified	752	*Gender:* • male - 50% • female - 50% Age: 9 - 18 yrs, *M* = 14 yrs	Cross-sectional data from follow-up study; χ^2 - tests	Suicide attempts ~ behavioural problems, drug problems

Walter *et al.*, 1995	6th - 8th grade students at 4 junior high schools in an economically disadvan-taged New York City school district.	Whole population	3 738	*Age: M* = 13,5 yrs; s.d. = 1,9 yrs; range 11-17 yrs. *Gender:* • male - 54% • female - 46% *Race/ethnicity:* • Hispanic - 81% • Black - 10% • other - 9%	Cross-sectional survey; multiple logistic regression (controlling for demographic factors, psychosocial factors, and the remaining behavioural factors)	Ever had sexual intercourse ~ ever engaged in assaultive behaviour ~ currently using substances. In addition, the odds for involvement in each behaviour, given involvement in the other two behaviours, were significantly increased.

Windle *et al.*, 1992	8th and 10th graders in the USA	Stratified	11 400	*Age:* • range: 11-17 • *M* = 13,4 for 8th graders and 15,3 for 10th graders *Race/ethnicity:* • white - 73% • black - 13% • Hispanic - 9% • Asian - 3% *Gender:* • male - 50% in 8th grade and 49% in 10th grade • female - 50% in 8th grade and 51% in 10 th grade	Cross-sectional survey; 2-way (sex x alcohol group) analysis of variance with the dependent variable being the risk behaviours (see adjacent column) (There were three levels to the alcohol group factor - abstain, light, and heavy)	Alcohol group ~ composite risk score compiled from the following risk behaviours as well as each of the risk behaviours: • taking another person's medication; • swimming alone; • diving in water of unknown depth; • taking alcohol/drugs while playing sports; • driving an all-terrain vehicle; • using a gun for any reason; • riding with a driver who is under the influence of alcohol/drugs; • skating in an unsupervised area; and • surfing or swimming in an unsupervised area.
					As above, but with logistic regression (The dv's were suicide ideation and attempts for each grade level	Lifetime suicide ideation and attempts ~ alcohol use and number of risky behaviours

Workman and Beer, 1990	1 Kansas high school	Not stated	126	*Gender:* • male - 47% • female - 53% *Grade:* • 9th - 32% • 10th - 25% • 11th - 21% • 12th - 22%	Cross-sectional survey; Pearson correlation coefficients	Current suicide ideation [as assessed by the Beck Scale for Suicide Ideation (Beck *et al.* , 1979)] ~ alcohol dependency [as assessed by the MacAndrew Alcohol Scale (MacAndrew, 1965)]

The other group includes studies in which the authors *do* interpret these relationships explicitly in terms of the syndrome of adolescent risk behaviour. The results of these studies indicate significant relationships between suicidal behaviour and:

- aggressive behaviours, cigarette use, and (for some categories of suicidal behaviours) use of other substances (Garrison *et al.*, 1993);

- various violence-related behaviours (Orpinas *et al.*, 1995);

- fighting, carrying firearms, cocaine use, and selected sexual risk behaviours (Sosin *et al.*, 1995);

- involvement in intercourse, assaultive behaviour, and substance use (Walter *et al.*, 1995); and

- alcohol use (Windle *et al.*, 1992).

These studies in which suicidal behaviour is explicitly related to the syndrome of adolescent risk behaviour have several strengths, including the following:

- they all have large samples;

- in most cases, they are representative of substantial groups of adolescents in the USA, for example, school students in the USA as a whole (Sosin *et al.*, 1995; Windle *et al.*, 1992), or an entire state (Garrison *et al.*, 1993);

- they use sophisticated analytical strategies that simultaneously take into account the influence of several variables such as logistic regression modeling (Garrison *et al.*, 1993; Orpinas et al., 1995; Walter *et al.*, 1995; Windle *et al.*, 1992) and principal component analysis (Sosin *et al.*, 1995); and

- they have been carried out recently, with three of the studies being published in 1995 (Orpinas *et al.*, 1995; Sosin *et al.*, 1995; Walter *et al.*, 1995).

Despite these strengths, it is not possible to conclude definitively that suicidal behaviour should comprise an aspect of the syndrome of adolescent risk behaviour. There are no studies that demonstrate relationships between suicidal behaviour and *all* of the components of risk behaviour comprising the original syndrome of adolescent risk behaviour. Also, with the exception of the study by Choquet and Menke (1989) which involved school students in Paris, all of the studies cited in Table 2.38 were carried out in the USA, and there is no evidence as to whether they are generalisable to adolescents in the Cape Peninsula and other parts of the world.

2.3.3 Behaviour exposing oneself to injury as a possible component of the syndrome of adolescent risk behaviour

Additional "candidate" behaviours for inclusion in the syndrome of adolescent risk behaviour are characterised by the adolescents placing themselves at risk for intentional physical injury by other people (for example, assault) or for unintentional injury. Of course, engaging in

assaultive behaviour (such as that included in the term "general deviance" (Jessor and Jessor, 1977) will serve to place the adolescent at risk for being injured in return. However, the behaviour referred to in this section does *not* include being exposed to intentional violence by others through engaging in violence oneself.

The evidence for including behaviour exposing oneself to risk for intentional injury by others or for unintentional injury in the syndrome of adolescent risk behaviour is considerably more flimsy than that for suicide. As regards unintentional injury, three studies conducted in the United Kingdom confirm that there is a relationship between behavioural problems and accidental injury (Bijur *et al.*, 1986, 1988; Davidson et al., 1988). However, these studies refer to children under the age of ten years. Furthermore, there are several studies in which driving while under the influence of alcohol was shown to be associated with one or more of the components of the original syndrome of adolescent risk behaviour (for example, Barnes and Welte, 1988; Donovan, 1993; Elliot, 1987; Jessor, 1987; Johnson and White, 1989; Sarvela *et al.*, 1990). Indeed, two studies explicitly argued that driving while under the influence of alcohol should be included in the syndrome of adolescent risk behaviour (Donovan, 1993; Jessor, 1987). One can regard driving while under the influence of alcohol as a specific manifestation of problem drinking, albeit one that has a relatively high probability of an adverse outcome. It is thus consistent with previous work that driving while under the influence of alcohol should be included as an aspect of the syndrome of adolescent risk behaviour. This aspect will thus not receive further attention. Studies in which the relationships between behaviour putting one at risk for intentional injury by others or for unintentional injury and one or more of the components of the original syndrome of adolescent risk behaviour, or suicidal behaviour, are enumerated in Table 2.39.

Table 2.39 Studies indicating that behaviours characterised by being at risk for intentional injury from others or unintentional injury should be included in the syndrome of adolescent risk behaviour

Reference	Population	Sample	N	Demographic breakdown of sample	Design and analytic strategy	Relationships reported (~ indicates that the behaviours are significantly related to each other)
Berman and Schwartz, 1990	Attenders at 4 outpatient units for drug abusers in the USA	All attenders in a 4-mo. period	54 cases (54 controls)	*Age:* 13 to 19 years; median age = 16,2 yrs. *Gender:* • male - 66% • female - 34% *Race/ethnicity:* • white - 93%	Prospective age-, gender-, and race-matched case-control study; χ^2 - tests to compare drug-abusing attempters with non-drug abusing attempters	Suicide attempts ~ being accident prone in pre-teen years
			69 cases 69 controls		Design as above; χ^2 - tests to compare drug-abusing attempters with non-drug-abusing non-attempters	Suicide attempts and drug abuse ~ frequent stealing, trouble with the law, being accident-prone

Bussing *et al.*, 1994	Non-institutionalised children aged 5 to 17 in the USA	Details not provided. Sample obtained from the 1988 National Health Interview Survey - Child Health Supplement.	11 630	*Race/ethnicity:* • Whites - 71% • African-Americans - 18% • Hispanics - 11%	Cross-sectional survey; stratified bivariate analyses using Wald's Test; multiple logistic regression predicting the occurrence of accidental injury in the previous year	• Parent report of a lifetime prevalence of emotional/behaviour problems ~ accidental injury rates in the preceding year for each ethnic group. • Extreme behaviour problems (as assessed by the Behavior Problem Index) ~ accidental injury in the preceding year for each ethnic group (This remained valid in the multiple logistic regression procedure when controlling for demographic factors, family composition, insurance status, and region of residence.)
Fe Caces *et al.*, 1991	High-school students in the US	Cluster	3 789	*Grades:* • 8th - 48% • 10th - 52% *Gender:* • male - 51% • female - 49%	Cross-sectional survey; descriptive data only presented	Increasing frequency of drinking in the previous month ~ various physically risky behaviours in the previous year (e.g. carrying a weapon other than a handgun or knife at school, hitchhiking, carrying a knife at school, going on a blind date with a relative stranger, walking alone through unsafe neighbourhoods, walking outside alone late at night)

Kidd and Holton, 1993	Adolescents aged 16 to 18 years who had obtained their driver's license in Vermont	?Con-venience	23	-	Cross-sectional survey; Pearson correlation coefficients	Alcohol use ~ risky driving practices
Loiselle *et al.*, 1993	Trauma service patients in Philadelphia PA	Whole population	134	Aged 13 - 19 yrs.	Prospective, age-matched control study; *t*- and χ^2 - tests	Positive alcohol or drug screens ~ injury from intentional or unintentional trauma

Two of the studies mentioned in Table 2.39 employed large national samples of children in the USA. The national sample of Bussing *et al.* (1994) included children aged 5 to 15 years; however, they controlled for age in their logistic regression models which indicates that their conclusions would be valid for the adolescents in their population. They found an association between behaviour problems and accidental injury. Fe Caces *et al.* (1991) provide descriptive data only in studying the association between frequency of alcohol consumption and various physically risky behaviours. However, the differences they report are sufficiently impressive to be convincing even in the absence of statistical confirmation; for example, for males, 90,1% of those who used alcohol on three or more occasions in the previous month had walked outside alone at night compared to 71,9% of those who had abstained in the previous month. The association between alcohol use and other behaviours exposing oneself to risk of physical injury was confirmed in the more limited studies of Kidd and Holton (1993) and Loiselle *et al.* (1993). Finally, the study by Berman and Schwartz (1990) was mentioned in the section above dealing with suicidal behaviour; in that study, significant associations were also shown between suicidal behaviour and being accident prone.

It was intimated above that there is a lack of convincing evidence that behaviour exposing oneself to risk of intentional injury by others or unintentional injury should be included in the syndrome of adolescent risk behaviour. The above review confirms this conclusion. Not only have there been relatively few studies providing data relevant to this issue, but they have all been conducted in the USA and they have focused on only two of the behaviours comprising the syndrome of adolescent risk behaviour (alcohol misuse and behavioural problems or "general

deviance"), although suicidal behaviour was studied by Berman and Schwartz (1990).

Given the lack of conclusion as to whether behaviour exposing oneself to intentional injury by others or unintentional injury should be considered as part of the syndrome of adolescent risk behaviour, there is clearly a need for additional studies addressing this issue. More specifically, there are no studies investigating whether this behaviour should be included in this syndrome among school students in the Cape Peninsula.

Chapter 3

Chapter 3

METHODS

The **objectives** of the study were as follows.

1. To obtain estimates of the prevalence of risk behaviours in the following domains according to school standard and home language(s), and gender: *(i)* suicidal behaviour; *(ii)* cigarette smoking; *(iii)* alcohol misuse; *(iv)* drug use; *(v)* road-related behaviour *(vi)* violent behaviour; and *(vi)* sexual behaviour.

2. To investigate whether the notion of a syndrome of adolescent risk behaviour is valid for high-school students in the Cape Peninsula and to investigate whether suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome.

3. To investigate the relationships between various risk behaviours, taking into account their influence upon one another.

3.1 THE INSTRUMENT

3.1.1 Components of the questionnaire

The questionnaire was designed so that it could be administered in a normal class period of 35 minutes. The actual questionnaire takes about 20 minutes to complete, with the remaining time being available for introducing the questionnaire and answering any questions that might arise.

An attempt was made to begin with the questions that would be least threatening and then progress to the more threatening questions such as drug use and sexual behaviour.

The contents of each component of the questionnaire will be described briefly. The full questionnaire is presented as Appendix 1, and additional information about the specific items included will be found in the next section of this chapter.

The *cover page* contained the instructions on completing the questionnaire. Although these instructions were also provided verbally immediately prior to the questionnaire being completed, they were listed on the cover page of the questionnaire to prevent misunderstandings.

The *preamble* elicited information about demographic characteristics such as school, age, gender, school class, and home language.

Part 1 was concerned with unintentional and intentional injury, and included, *inter alia*, suicidality, road-related behaviour, and interpersonal; violence.

Part 2 included items involving various aspects of substance use such as cigarette smoking, alcohol consumption, cannabis use, and Mandrax use. In addition, Part 2 contained an item that was included to check the extent of over-reporting. The respondents were asked if they had ever used a fictitious drug (Lovar 25), and, if they had, to provide some details of frequency of use. Clearly, if a student answered positively to this item, the validity of all his or her other responses was open to question; that student's questionnaire was excluded from the study.

Part 3 was concerned entirely with sexual behaviour. The first question was asked whether the respondent had ever participated in heterosexual vaginal intercourse. If they had, they were asked various questions regarding their history of heterosexual vaginal intercourse. For girls, if they had not experienced heterosexual vaginal intercourse, they went to the next section of the questionnaire. For boys, if they had not experienced heterosexual vaginal intercourse, they were asked if they had experienced homosexual anal intercourse. If they had, they were asked some additional questions in this regard. If they had not, they went to the next section of the questionnaire.

Part 4 contained some ruled lines and the request that the students use this space to make any comments that they wished.

3.1.2 Selection of items of risk behaviour

a) General

An attempt was made to ensure that the individual items had the following characteristics.

- The responses required "Yes" or "No" answers to increase the validity of the responses and decrease the amount of time required.

- The emphasis is on observable risk behaviour as opposed to attitudes, beliefs, and intentions. Not only is observable risk behaviour all that is necessary to address the aims and objectives of the study, but the influence of cultural and linguistic variables is likely to be reduced if the focus was on observable behaviour.

- The behaviours were defined as clearly as possible so as to reduce the likelihood of ambiguity.

- Participation in risk behaviours was defined in relation to a specific time period - for example, the item involving knife carrying at school was as follows: *During the past 4 weeks at school did you ever carry a knife to be used as a weapon?* Other risk behaviours were defined in relation to a specific event - for example, many of the items involving sexual intercourse referred to the last coital episode. Anchoring the items in this manner increases validity since there is less potential for subjective impressions to bias the results.

b) Suicidal behaviour

There were three questions in which suicidality was addressed:

- *During the past 12 months did you ever seriously think about harming yourself in a way that might result in your death?*

- *During the past 12 months did you ever tell anyone that you intended putting an end to your life?*

- *During the past 12 months did you ever actually try to put an end to your life?*

The term "suicide" was avoided as it might be too jarring for the participants. Instead, the first question referred to "harming yourself in a way which might result in your death" and the following two questions to "putting an end to your life". The questions are independent, and are located at different points on a hypothesised continuum of suicide intentionality.

The first and the third questions listed above are very similar to those used in the YRBS. These questions in turn were based on the items included in research involving suicide among adult populations, although the wording was altered to make them more suitable for adolescent populations (Paykel *et al.*, 1974; Ramsay and Bagley, 1985, both cited in O'Carrol *et al.*, 1993). The item regarding telling anyone of an intention to put an end to their life was inserted in the light of accumulating evidence that those who do successfully commit suicide have communicated this intent to others before their death (Shaffer and Piancentini, 1994). A 12-month recall period was selected to be consistent with the YRBS.

There was no attempt to elicit data regarding the medical severity of the attempted suicide. In the YRBS, there was an item in which it was asked if any attempt resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse (O'Carrol *et al.*, 1993). This is important information since there is some evidence that most self-reported suicide attempts among adolescents do not result in medical attention (Paykel et al., 1974; Smith and Crawford, 1986). However, in South Africa health services are not necessarily easily available, and those services which are available are not equally accessible (Chetty, 1995). Questions regarding contact with medical services following a suicide attempt thus reflect not only the medical severity of the attempt but also the accessibility of health services. For this reason, and also because of the need to keep the questionnaire reasonably brief, items regarding the need for medical attention following a suicide attempt were not included.

c) Cigarette smoking

The first question regarding cigarette smoking (Table 3.1) identified current regular smokers. Responses to this question are to some extent compatible with similar questions in the HBSC Study and the YRBS. The item involving whether the student had ever tried stopping smoking was included to assess attempts at cessation. It is very similar to an item in the YRBS (although the responses to this question have not been published). Finally, although the intention to commence smoking is not a behaviour, it may precede experimentation with smoking (American Cancer Society, 1992). Students answering affirmatively to this item are thus at risk for initiating smoking (Marcus *et al.*, 1993).

Clinical impressions suggested that the prevalence of the use of other forms of tobacco, such as chewing tobacco, snuff, pipes, and cigars was very low in the population of interest. The questions were thus confined to cigarette smoking.

Table 3.1 Questionnaire items regarding cigarette smoking

Do you smoke at least one cigarette per day?
IF YES:
• *Have you ever tried stopping?*
IF NO:
• *Have you ever smoked?*
• *Do you intend to start smoking?*

d) Alcohol use

The format of the item dealing with alcohol was similar to that of the items dealing with drug abuse. The students were asked:

Have you ever used alcohol (including beer and wine)?

If they had ever used alcohol, they were asked:

How many times have you used alcohol in the past 7 days?

How many times have you used alcohol in the past 4 weeks?

The rationale for these time periods is analogous to that for the equivalent questions regarding drug abuse. In addition to these questions, the students were asked about episodic heavy drinking, *viz.*

How many times have you had 5 or more drinks on one occasion in the previous 14 days?

This item was included because of the association of heavy episodic drinking with several adverse outcomes such as motor vehicle crashes, interpersonal violence, and vandalism (Blanken, 1993). A 14-day period was chosen as opposed to the four-week period used for other items involving alcohol and drug use to improve validity.

As mentioned above, students were asked about travelling in a motor vehicle knowing or strongly suspecting that the driver was affected by alcohol or dagga, and driving a motor vehicle on a public road while affected by alcohol or dagga, in the section dealing with road-related behaviour.

e) Drug use

Questions were asked about the following specific drugs: *(i)* smoking cannabis (dagga); *(ii)* smoking cannabis and methaqualone (Mandrax) together ("White pipes"); *(iii)* sniffing glue, petrol or thinners; and *(iv)* using injectable drugs (mainlining).

Although cannabis can be ingested with food, it was decided to include only cannabis smoking since impressions are that this is the only route of administration that is used with any frequency in South Africa. The question referred to dagga *on its own* to distinguish this from smoking cannabis with methaqualone, which is inquired about in the following question. Since methaqualone is generally only smoked with cannabis, it was not necessary to inquire about the use of methaqualone other than when used in this manner. The item about use of solvents referred to glue, petrol, and thinners so as to include all possible sources of solvent inhalation; the word "solvents" was not used in the question since there was concern about whether this word would be familiar to the students. Although it was not anticipated that the prevalence of injectable drug use would be high, it was included because of its relevance for HIV transmission (NACOSA, 1994).

For each of the above substances, the respondents were first asked if they had ever used the substance. It is important to have data about lifetime use of these substances. Even though the direct psychological or medical sequelae of occasional use may be trivial, there is evidence that even a single use of various substances may place adolescents at risk for negative outcomes (mediated by indirect mechanisms) (Blanken, 1993).

If a student responded positively to any of the above substances, they were asked how many times they had used that substance in the previous seven days, and how many times they had used it in the previous four weeks. In the YRBS, the recall period was 30 days; this period was chosen to provide results that would be comparable with the National Institute on Drug Abuse funded project: *Monitoring the Future: A Continuing Study of the Lifestyles and Values of Youth* (Blanken, 1993). The data from high-school students in the Cape Peninsula would thus be comparable with both these projects. The recall period of seven days was included to provide estimates of the prevalence of more recent use.

There are items referring to substance use in the domain of road-related behaviour. There are several other contexts in which drug use can exert an especially negative impact, such as when it is associated with interpersonal violence or sexual intercourse. Limitations in terms of the length of the questionnaire prevented the inclusion of items regarding alcohol use in these contexts. In addition, it was not possible to inquire specifically about other drugs that the students may have encountered such as cocaine; however, there was a question in which they were asked whether they had used any other types of drugs and, if they had done so, to name these drugs.

f) Road-related behaviour

The first question in this section was:

> *In the past 12 months have you ever ridden on a motor-bike or motorscooter as a passenger or a driver?*

This question was included for the following two reasons.

- Riding on a motorcycle is in itself a relatively unsafe activity. In the USA, two thirds of all motorcycle deaths occur in the 15 to 24-year age group (Halperin *et al.*, 1983). Furthermore, the mortality rate for motorcyclists involved in traffic accidents is 5 to 15 times higher than that for motor car drivers and passengers, and any injuries they sustain are more severe than those sustained by the occupants of motor cars (Baker et al., 1984; Riley, 1975).

- It served as a stem question for the following item which involved the use of helmets.

The respondents that answered "Yes" to the above item were asked:

In the past 12 months, did you ever ride without a helmet?

This question was motivated by helmets being one means of reducing the morbidity and mortality associated with motorcycle accidents (Watson *et al.*, 1981); in the USA, it has been shown that they reduce the risk for death by 28% to 73% (General Accounting Office, 1991; National Highway Traffic Safety Administration, 1980, both cited in Waxweiler *et al.*, 1993).

There is also evidence from the USA that helmets reduce the risk of head injuries from bicycle accidents (Thompson *et al.*, 1989, cited in Waxweiler *et al.*, 1993). Items regarding helmet use by cyclists were included in the YRBS (Waxweiler *et al.*, 1993). However, it was decided not to include

items about helmet use among cyclists since at the time the survey was carried out their use was extremely rare.

The following two questions refer to being injured in a road-related event, *viz.*:

- *In the past 12 months have you been involved in an accident while travelling in a motor vehicle (excluding motor bikes)?*

- *In the past 12 months have you been injured by a motor vehicle, motor bike or bicycle while walking or standing?*

These two questions differ from most of the other questions in the questionnaire in that they do not inquire about the possible consequences of risk behaviour (as opposed to the risk behaviour itself). For example, the *consequence* of an accident could have been caused by the *behaviour* of driving a motor vehicle while intoxicated. The possible contribution of the accident "victims" to their accidents is indicated by the finding that adolescents who have a history of motor vehicle accidents are more likely to be injured later in life (Halperin *et al.*, 1983). Of course, the accidents or injuries could be result of risk behaviour on the part of *other* people (and not the respondent), or the result of a "genuine" accident that was not the result of any risk behaviour.

The following two items *do* refer to a risk behaviour, i.e. seat belt use. The students were asked:

> *In the past 12 months, did you ever travel in the front passenger seat of a motor vehicle?*

If they replied "Yes" to this item, they were asked:

> *On the last occasion you were travelling in the front passenger seat of a motor vehicle was there a seat belt available?*

If they replied "Yes" to this item, they were asked:

> *Did you actually wear the seat belt for the whole journey?*

There is consensus that the use of a seat belt while travelling in the front seat of a motor vehicle reduces the risk for fatal and non-fatal injuries considerably (National Highway Traffic Safety Administration, 1988, cited in Waxweiler *et al.*, 1993). The first of the questions involving seat belt use referred to travelling in the front passenger seat of a passenger vehicle. Driving a vehicle was excluded since the population in this study included youth younger than the legal driving age. Driving while under the legal driving age is also a risk behaviour and is inquired about in another question (see below). It was thus decided to exclude this from the questions involving seat belt use so as not to include two risk behaviours in one question.

The item regarding whether the respondent had travelled in the front passenger seat of a motor vehicle in the previous 12 months was included only to serve as a stem question for the following questions. The question regarding whether a seat belt was actually worn on the last occasion they travelled in a motor vehicle was limited to those students who had travelled in the front passenger seat of a motor vehicle in the previous 12 months **and** who had a seat belt available to them on this occasion. The rationale for this was to restrict the question to those who were in a position to make a choice about wearing a seat belt or not. This latter

aspect was included since the impression was that there were still a substantial number of vehicles on the roads in the Cape Peninsula that were not fitted with seat belts.

The final question involving seat belt use was the only item in the questionnaire in which a belief of the respondent was elicited:

> *Do you think that wearing a seat belt gives you less chance of being injured in a motor vehicle accident?*

This item was included to assess the extent to which a failure to use seat belt could be attributed to ignorance about their potentially beneficial effects.

The remaining items in the section of the questionnaire in which road-related behaviour is addressed are concerned with travelling in a motor vehicle or driving a motor vehicle on a public road in risky circumstances. As regards the former aspect, the students were asked:

> *Have you travelled in a motor vehicle in the past 12 months?*

This question was inserted to serve as a stem question; if the answer to this question was "Yes", they were asked:

> *In the last 12 months have you travelled in a motor vehicle knowing or strongly suspecting that*
>
> *a. The vehicle was overcrowded?*
>
> *b. The vehicle was not roadworthy or not safe to drive?*

c. *The driver did not have a license?*

d. *The driver was affected by alcohol or dagga?*

The format of the following question was similar. They were asked;

Have you ever driven a motor vehicle (excluding a motorbike) on a public road?

If the respondent answered affirmatively, they were asked if they had driven in each of the circumstances listed for the previous question above. Even though the majority of the students were not old enough to have a license to drive a motor vehicle on a public road, this question was included since:

- doing so can be considered as a risk behaviour; and
- many of the students (particularly in schools administered by the Department of Education and Culture) are old enough to drive a vehicle legally on a public road.

g) Interpersonal violence

Among the types of interpersonal violence that were included in the questionnaire were:

- being the victim of physical aggression;

- perpetrating acts of physical aggression; and

- vandalism.

However, much of the above aspects of interpersonal violence is specific to its context. Questions regarding these aspects are thus grouped into the following contexts:

- school;

- home; and

- outside of home or school.

Thus, the first question referred to the school context:

During the past 12 months <u>at school</u>

- *Have you been physically injured by another pupil?*

- *Have you been physically injured by a member of staff (excluding corporal punishment)?*

- *Have you physically injured another pupil?*

- *Have you been robbed?*

- *Have you caused serious damage to property?*

Considerations of space prevented asking all these questions with respect to the contexts of home and outside of home and school. It was decided to be relatively more inclusive with respect to the school context for the following reasons:

- there is greater potential to intervene in the school context than the other contexts mentioned; and

- being the victim of an act in interpersonal violence in the school context is the result of risk behaviour of *somebody else* in the school context.

Thus, neither robbery nor causing serious damage to property was included in the questions referring to the home context, and robbery was not included for the questions that refer to outside of home or school. In addition, some aspects of interpersonal violence are not directly applicable to the other contexts, for example those involving students or teachers. The questions involving interpersonal violence at home and outside of home or school are as follows:

During the past 12 months <u>at home</u>

- *Have you been physically hurt by an adult?*

During the past 12 months <u>outside of home or school</u>

- *Have you been physically injured by anybody?*

- *Have you physically injured anybody?*

- *Have you caused serious damage to property?*

The following two questions referred to the carrying of weapons. This is an important behaviour since an episode of interpersonal fighting that may have ended with minor injuries can be transformed into a tragedy if the weapons result in death or serious injury (Lerer and Hansson, 1993; Loftin *et al.*, 1991; O'Carrol *et al.*, 1993). In the YRBS study, one of the two questions involving weapon carrying involved guns exclusively since it was thought that this was the priority weapon in the USA. However, in the Cape Peninsula, it was thought that knife carrying and not gun carrying should be prioritised. In addition, it was decided to focus on the school context for the items involving weapons carrying for the reasons enumerated above for the other aspects of interpersonal violence. The first question involving weapons carrying was as follows:

> *During the past 4 weeks <u>at school</u> did you ever carry a knife to be used as weapon?*

It was necessary to specify "to be used as a weapon" to exclude those students who carried a knife for other purposes. If the students answered "Yes" to this question, they were asked:

> *Did you always carry a knife?*

This was included to assess the extent to which knife carrying was a regular phenomenon. It would have been preferable to obtain more detailed information about the frequency of knife-carrying, but this was

prevented by space limitations. The following question was included to gain data regarding the extent to which other weapons were carried:

> *During the past 4 weeks at school did you ever carry any other weapon or weapons?*

If they replied "Yes" to this question, they were asked:

- *Did you always carry another weapon?*

- *What was the weapon or weapons?* [Some lines were provided for them to enter the weapons that they had carried]

The final three items involved behaviours increasing the risk of victimisation:

- *During the past 4 weeks did you go out at night beyond your neighbourhood without knowing how you were going to get home?*

- *During the past 4 weeks did you go out at night beyond your neighbourhood and walk home alone?*

- *During the past 4 weeks did you go out at night beyond your neighbourhood and hitch-hike home?*

The focus of these items was on behaviour involving travelling at night. There were various other behaviours involving victimisation that could have been included, for example talking to strangers that tried to detain

one, showing money that was being carried, riding on empty buses and trains, and going on a blind date (American School Health Association, Association for the Advancement of Health Education, Society for Public Health Education Inc., 1989). However, it was decided not to include these partly because the extent to which they constitute risk behaviours varies considerably according to the context in which they take place. In the above items, an attempt was made to ensure that the behaviours described in almost all cases necessarily put one at risk for assault. This is the reason that it was specified that the student had gone out *at night beyond the neighbourhood.*

h) Sexual behaviour

The only forms of sexual behaviour that were addressed in the survey involved sexual intercourse since this behaviour is most relevant for pregnancy and sexually-transmitted diseases. The first question of this section was:

> *Have you ever had heterosexual vaginal intercourse? This means intimate contact with someone of the opposite sex during which the penis enters the vagina (female private parts).*

It was decided to include this definition to avoid any misunderstandings about what the question was referring to. The possibility of supplying some slang terms for coitus in addition to or instead of the above explicit definition was rejected for the following reasons (Morris *et al.*, 1993):

- there are differences between various sub-groups of adolescents (even within a particular language group) in the

slang terms used - a term that may be accepted slang in one sub-group may be considered offensive in another, and this may have alienated certain students; and

- there was concern it would have hindered cooperation with parents and educationalists.

Female students who responded that they had not experienced heterosexual vaginal intercourse were asked to go to Part 4 of the questionnaire in which space was provided to make any comments that they wished to. Male students who had not experienced this were asked to go to question 6 in this section in which they were asked about homosexual anal intercourse. Female students who had not participated in vaginal intercourse were *not* asked about anal intercourse. It is possible that some female students had not experienced vaginal intercourse but had experienced anal intercourse. It is not possible to identify this group from the responses to the questionnaire. However, female students who had not experienced vaginal intercourse were not asked about anal intercourse for the following reasons:

- there were in all likelihood very few students in this situation; and

- there was concern about causing offense to some of the female students.

The students that indicated that they had participated in heterosexual vaginal intercourse were asked additional questions in this regard. The first of these additional questions was:

How long ago did you last have vaginal intercourse?

The following questions referred to the last occasion on which they had intercourse:

- *How old was your partner?*
- *Had you known your partner for more than 7 days?*
- *Did you or your partner do or use anything to prevent pregnancy (family planning)?*

There were three response options to the last question: "No", "Yes", and "Don't know". The latter option was included mainly to include the possibly of the boys not knowing if their partners were using a contraceptive method.

These three aspects are all relevant from the point of view of disease transmission. The inclusion of the first item was motivated by the observation that many young girls have intercourse with men who are substantially older than they are. This is of concern from the following points of view:

- there is the possibility of the girls not having sufficient power in these interactions, with the resulting possibility of abuse or not being able to insist on sexual practices reducing the probability of sexually transmitted disease or unwanted pregnancy (Ehrhardt *et al.*, 1991); and

- there is a higher probability of older men having been exposed to sexually transmitted infections (especially HIV infection) than younger men, which would place their partners at risk.

The item regarding whether the partner was known for more than seven days was intended to address the issue of sexual intercourse with "casual" partners, while the relevance of the item concerned with contraception is obvious. Students that answered "Yes" to the item involving contraception were then asked: *What did you or your partner use? (Indicate more than one if necessary).* Various options were listed. Pilot investigations revealed that the students would be able to identify each of the above methods from the words used, and that the use of slang terms in this context was necessary to reduce misunderstandings.

The methods listed all refer to pregnancy prevention. It is possible that some students were using condoms for the purposes of sexually transmitted disease prevention and not pregnancy prevention. There is no way that these students could be identified from the responses to the questionnaire. However, it is probable that most of the students using condoms were doing so at least partly for pregnancy prevention purposes, and that they would thus have indicated condom use in the questionnaire.

It was decided to ask the above questions with respect to the last coital episode to increase the validity of the responses. Not only is recall improved, but the specificity of the responses is increased; for example, asking about whether contraception was used on the last coital episode provides more specific data than asking about contraception is "always" used. A term such as "always" can be interpreted in different ways by different people, particularly when translated into different languages.

They were then asked the following questions:

- *How old were you when you first had vaginal intercourse?*

- *With how many different partners have you had vaginal intercourse in the past 12 months?*

- *Have you ever had heterosexual anal intercourse? This means intimate sexual contact with someone of the opposite sex during which the penis enters the anus ("back passage").*

Females were then asked to go to Part 4 of the questionnaire, and males were asked to turn the page to the questions dealing with homosexual anal intercourse. Male students who had not experienced heterosexual vaginal intercourse had already been asked to complete this section.

Age at first intercourse is of importance for several reasons. If pregnancy results from the coitus, it is (as mentioned in the Literature Review) controversial whether the obstetrical outcome is less favourable for younger patients on the grounds of age *per se*. However, there is good reason to believe that the adverse psychosocial concomitants of pregnancy are more severe for younger adolescents. In addition, the younger an adolescent is when commencing sexual activity the longer he or she will be at risk for its adverse consequences. Finally, early commencement of sexual activity is a risk factor for an increased number of lifetime sexual partners, the acquisition of sexually transmitted diseases, and unwanted pregnancy (Dryfoos, 1990).

Heterosexual and homosexual anal intercourse are very high-risk activities for transmission of HIV infection and other sexually transmitted

diseases (Masters *et al.*, 1988). Thus, although there were some reservations about including these practices in the questionnaire for fear of antagonising the participants, their parents, or the educationalists, these behaviours were included because of their importance for the transmission of sexually transmitted infections.

The format of the questions regarding homosexual anal intercourse was analogous to that for heterosexual vaginal intercourse. The first question was:

> *Have you ever had homosexual anal intercourse? This means intimate contact with another male during which the penis enters the anus ("back passage")?*

- Boys that answered negatively to this question were asked to go to Part 4 of the questionnaire. Boys that answered affirmatively were asked additional questions about their experience of homosexual anal intercourse.

3.1.3 The different versions of the questionnaire

It was necessary to translate the questionnaire into Afrikaans and Xhosa. Initially, it was hoped that the students attending high schools administered by the DET would be able to complete the English version of the questionnaire since English is the medium of instruction in these schools. However, it emerged during the pilot studies that there would be a substantial number of students (particularly in the junior high-school

standards) whose ability in English would not have been sufficient to complete the questionnaire in this language.

The questionnaire was translated into Afrikaans and Xhosa by teams consisting of at least two translators for each language who achieved consensus about the most appropriate translation. The questionnaire was then back translated into English by other people who had Afrikaans or Xhosa respectively as their home language. This back-translated version was compared with the original version. Any discrepancies were resolved by negotiation between the original translators and those doing the back translations.

In the HoA, there were students for whom consent could not be obtained for questions dealing with sexuality to be included; further details in this regard are presented below. There are thus additional versions of the questionnaire in English and Afrikaans that do not have these questions. In these versions, Part 3 is omitted entirely as are those questions in Part 1 that are concerned with sexual harassment or interference in Part 1.

The full versions of the English, Afrikaans, and Xhosa questionnaires are provided in Appendix 1.

3.2 THE SAMPLE

The study population was defined as all students attending high schools in the Cape Peninsula (which was defined as the 01 economic region), South Africa. High schools consist of standards 6 to 10, which are equivalent to grades 8 to 12 in the USA.

Students attending private schools or colleges were excluded for the following reasons:

- they comprise a relatively small proportion of the total number of high school students in the Cape Peninsula (about 3000 out of a total of about 170 000);

- it would be difficult to obtain a representative sample in the light of the relatively large number (about 20) and religious, language, and pedagogical diversity of the schools; and

- any intervention programmes informed by the data provided by the research are most likely to be organised and implemented through the various state education departments and information regarding private schools is thus not directly applicable.

Special schools (which cater for those unable to cope with the academic demands of mainstream schools) were excluded from the sampling frame as a different methodology would be required to account for the particular circumstances pertaining to this group. Technical schools were included in the sampling frame along with the other schools.

At the time that the study was carried out, the non-private schools in the Cape Peninsula were administered by 4 education departments; further details about these departments are provided in Table 3.2.

Table 3.2 Selected details regarding the education departments in the Cape Peninsula

Department	Population group*	Number of schools
Department of Education and Training (DET)	Black	13
Department of Education and Training of the House of Assembly (HoA)	White	50
Department of Education and Training of the House of Delegates	Asian	2
Department of Education and Training of the House of Representatives (HoR)	Coloured	75

* Indicates the population group (according to the Population Registration Act of 1951) for whose school education each department was responsible.

Schools falling under the House of Delegates were excluded from the study owing to: *(i)* not being able to make suitable arrangements for the administration of the questionnaire at the selected school; *(ii)* the small numbers of students; and *(iii)* refusal of permission to include items dealing with sexuality in the questionnaire. Details about the contact with

the school that was selected from this Department are provided in Appendix 5.

A total of 16 schools was selected; 4 from the DET and 6 from each of the other departments.

The schools in the latter two departments were stratified into 3 social classes according to the areas in which the schools are situated, and 2 schools were chosen from each social class; this is justified by the observation that social class is an important determinant of a variety of risk taking behaviours (Sachdev, 1990).

For the schools administered by the HoA, the social classes were derived from the composite *indices of levels of living* that have been developed for each suburb of Cape Town using the following indicators (Riley *et al.*, 1984): *(i)* income; *(ii)* occupancy rates; *(iii)* the extent of shared accommodation by different families; *(iv)* the proportion of people owning cars; *(v)* workers' educational levels; *(vi)* the numbers of single mothers with more than three children; and *(vii)* unemployment levels.

It is not possible to use these composite indices for the schools administered by the HoR as they are based partly on data obtained in the 1980 census and are thus not available for schools in Mitchell's Plain. The *dependency ratio* was thus used to stratify the schools administered by the HoR according to social class; this ratio is a measure of the number of people in the "active" age groups (15 to 64 years) as compared to those in the "dependent" age groups (0 to 14 years and 65 years and above) (City Planner's Department, 1988).

The schools administered by the DET were divided into two strata according to level of urbanisation, *viz.* schools in the settled urban communities of Langa, Guguletu and Nyanga (7 schools) and schools in the more recently established areas of New and Old Crossroads and Khayelitsha (6 schools). Two schools were randomly selected from each stratum. Level of urbanisation as opposed to social class was used as the stratification criterion for schools falling under the DET for 2 reasons:

- the indices of social class used for the other departments are not available or valid for the areas in which the DET schools are situated (Riley *et al.*, 1984; City Planner's Department, 1988); and

- the rapid urbanisation of blacks is likely to have a considerable impact on risk taking behaviour (Everatt and Orkin, 1991; Flisher, unpublished document; Rossi-Espagnet, 1984; Van der Merwe, 1988; Yach, 1988).

The schools in each of the above strata are listed in Appendix 2.

In the case of schools falling under the HoA and HoR, the entire school was selected. In the case of schools falling under the DET, approximately 40% of the students in each school were selected. A larger proportion was not selected as this would have resulted in a far larger proportion of students being selected from this department compared to the other departments. The schools were stratified according to standard, and the required number of classes randomly selected from each stratum. All the students that were present on the day the questionnaire was administered participated in the study.

3.3 PILOT STUDIES

Pilot studies were carried out to seek information regarding the following aspects:

- whether the questionnaire was appropriately translated, particularly in terms of the level of difficulty and formality of the language and the appropriateness of any slang terms that were used;

- difficulties experienced or anticipated in administering the questionnaire in a classroom context;

- whether there were any other important areas of risk behaviour that were not included in the questionnaire; and

- the general attitude towards participating in the study.

All the adolescents who participated in the pilot studies were told that it was not necessary to answer the questions "truthfully" since the purpose of the pilot study was to learn about the instrument and not the behaviour of the students. It was decided not to conduct pilot studies in any non-private schools owing to the large amount of time that would have had to be spent in obtaining the necessary permission to do so.

The following pilot studies were carried out.

- The Xhosa version of the questionnaire was completed by a group of eight adolescents attending high schools administered by the DET. These students were recruited at the Nyanga Day Hospital where they had attended for various minor physical complaints. The participants completed the questionnaire in private, after which they took part in a group discussion facilitated by a Xhosa-speaking research assistant. Thereafter, they were each interviewed individually by the research assistant.

- The English version of the questionnaire was administered to a group of standard 8 students at a private high school in Cape Town. This was done to establish if there were any difficulties associated with administering the questionnaire in a classroom context. After the students had completed the questionnaire, the Principal Investigator facilitated a discussion with the class, focusing specifically on the questions listed above. Finally, an interview was held with the class teacher, who had been present while the questionnaire was being administered.

- The Afrikaans version of the questionnaire was administered to the standard 8 class of a school administered by the HoR by their class teacher. The class teacher then conducted a discussion with the class and reported her own impressions as well as those of the students to the Principal Investigator. In addition, the Principal Investigator administered the English version of the questionnaire privately to a convenience sample

of six students in standards 6 to 9 at high schools administered by the HoR, and interviewed each of the students thereafter.

Numerous improvements in the manner in which the questions were asked were made on the basis of these pilot studies. There were no specific difficulties unearthed in administering the questionnaire in a classroom context. However, students in all of the pilot studies mentioned above emphasised the necessity of attempting to ensure that the teachers were not in the classroom when he questionnaire was administered. There was no indication that any of the students exhibited a negative attitude to participating in the study, although the concern was expressed that there would be some students who would not take the study seriously.

3.4 PROCEDURE

3.4.1 Protocol review process

After consensus had been achieved between the investigators regarding the protocol, it was presented by the Principal Investigator at a protocol review session of the Centre for Epidemiological Research in Southern Africa (CERSA) and the Institute for Biostatistics (IB) of the South African Medical Research Council. This protocol is provided as Appendix 3.

- There were many comments made at the review session, and a memorandum was distributed a few days after the meeting to those who were present at the meeting (Appendix 4). The only substantive changes resulting from the protocol meeting involved sample size, number of strata, and policy regarding re-visiting the schools to elicit questionnaire responses from absentees.

3.4.2 Obtaining permission to conduct the study

There are many levels at which it may be necessary to obtain permission to conduct a study in the school context. These include the following:

- the management of the education departments;

- the schools, including the principals, the school committees or parent-teacher-student associations, the staff (especially the guidance teacher), and the students themselves, possibly represented by a students' representative council.

The specific stakeholders that need to be involved in the process vary according to the education department and the school concerned. Details about the process of obtaining permission to conduct the study are presented in Appendix 5. This section will consist of a summary of those aspects of this process that cast direct light on the results of the study.

The Department of Education and Training (DET) gave unconditional permission to proceed. All the selected schools participated.

Permission to conduct the study was granted by the Department of Education and Culture of the House of Representatives (HoR) on condition that the results were not reported according to education department. All the selected schools agreed to participate. However, three of the schools required active consent from the parents/guardians of the students for them to complete Part 3 of the questionnaire in which data regarding sexual behaviour was elicited; the parents/guardians were required to sign a piece of paper giving permission for their children to participate. An additional school required passive consent in that the parents/guardians were requested to contact the prioncipal of he school if they had any objection to their child completing the questionnaire. Students whose parents refused permission did not complete any part of the questionnaire, unlike the situation for the schools administered by the House of Assembly in which the students who were refused permission to complete those parts of the questionniare involving sexual behaviour

completed an abbreviated version of the questionnaire in which these parts were omitted.

Permission to conduct the study was granted by the Department of Education and Culture of the House of Assembly (HoR) on condition that a parent/guardina of each selected student would have to give written permission for their child to participate. In addition, the parents/guardians would need to be given the opportunity of discussing the questionnaire with the investigators. However, parental permission was not necessary for an abbreviated version of the questionnaire in which all the questions dealing with sexuality were excluded. Unlike the schools in the other education departments included in this study, there were four selected schools that were not willing to participate. In each case, anotehr school was randomly selected from the remaining schools in the same social class stratum. Four of the schools were willing to have the full version of the questionnaire administered to those students whose parents had given permission for this. The remaining students at these schools, as well as all the students in the other two schools completed the abbreviated version of the questionnaire in which the questions dealingh with sexuality were excluded.

The final protocol was approved by the Ethics Committee of the Faculty of Medicine of the University of Cape Town.

3.4.3 The administration of the questionnaire

The questionnaire was administered at the end of the second school quarter and at the beginning of the third school quarter in 1990.

It was decided not to involve the school principals or the teachers in the administration of the questionnaire for the following reasons:

- a standardised procedure was desirable and this would not have been possible as different principals and teachers would have been involved with different classes and schools;

- the probability of gaining access to the schools was increased as minimal demands were being made on the resources of the schools;

- the students were less likely to regard the whole enterprise with suspicion as it was not directly associated with the education departments; and

- the validity of the responses was increased as there was no possibility of the school staff having access to the students' responses.

The only people present in the classrooms (besides the students) when the questionnaire was being administered were members of the research team. However, the principals of two of the schools falling under the HoA insisted that the teachers administer the questionnaire; in both these schools the questions dealing with sexual relationships were excluded, and there was at least one member of the research team present at the school while the questionnaire was being completed.

At the beginning of each session, a member of the research team drew attention to and elaborated upon the following information that was on the front cover of the questionnaire booklet:

- the rationale for the study;

- instructions were given as to how the questionnaire should be completed;

- the anonymity of the responses; and

- the fact that the students would be given feedback about the results of the survey and given some advice about what could be done to reduce the extent of their risk taking behaviour.

The students were asked if they had any questions before completing the questionnaire. They were instructed to place the completed questionnaire in the envelope supplied for this purpose; it was hoped that this would increase the validity of the responses. No students refused to complete the questionnaire.

Examination circumstances were simulated in that the questionnaire was administered in a uniform and formal manner. Detailed information about the process involved in administering the questionnaire at each of the schools included in the study is provided in Appendix 5. Additional comments are provided below.

- In general, the level of discipline maintained while administering the questionnaire was satisfactory and the students were not able to communicate with each other or see the responses of their classmates.

- The venues and group sizes when administering the questionnaire varied between schools depending on the wishes of the principal and the staff and the circumstances pertaining to each school. In some cases, the questionnaire was administered in classrooms, while in other cases a larger room (e.g. the school hall) or the school playing fields were used.

3.4.4 Follow-Up contact with the schools and education departments

Shortly after the data had been gathered at a school, the principal and other key staff members received a letter in which they were thanked for their cooperation with the researchers and informed that feedback would be provided as soon as possible.

In 1993, each school was visited by a member of the research team who had been very involved in the administration of the questionnaire at almost all the schools and was thus known to these principals. She delivered copies of reports in which the prevalence data obtained in the study were presented and discussed (Flisher *et al.*, 1993 a-h). The principal was asked to make the report available to other members of the school community, for example the teachers, school committee, students' representative councils, and individual interested students. In addition, she delivered several posters to each school in which some key findings were presented and the students were given some advice about some of the areas mentioned. These posters were available in English and Afrikaans only; it was felt that the students at the schools administered by the Department of Education and Training would be able to read the

English versions. The findings for suicidal behaviour were not presented because of concerns about this precipitating suicide attempts on the part of some of the students (Shaffer *et al.*, 1988). The school at which the pilot study was carried out also received a copy of the report and several copies of the poster. The poster was produced by the Medical Illustration Department at Groote Schuur Hospital using information provided by the research team.

The education departments also received copies of the report and the poster. Both the schools and the Westernm Cape Education Department (which has replaced the education departments participating in the study) will receive copies of further reports as they become available (Flisher *et al.*, in press a,b)

3.5 ANALYSIS

The analytic strategy that was adopted for each of the objectives of the study will be presented below. The Statistical Analysis System (SAS) statistical software package was used for all the analyses (Stokes *et al.*, 1995).

3.5.1 Objective 1

For each education department, the basic design was that of a cluster sample. Since the proportion of students selected from each department varied, an estimate for each department was weighted to produce an overall estimate. Ideally, weights should be based on the number of students in each education department for the particular gender/age/standard category. However, the education departments were only able to provide the total number of students in their department as opposed to the number of students in each gender, age, or standard category. The numbers of students in each gender/age/standard category was estimated from the data. The estimator used for estimating percentages was the ratio estimator.

For each item, there were some missing values. For the purposes of the analysis, these missing values were regarded as being "no" responses. It is probable that a proportion of the students for whom there were missing values for a particular item would have answered affirmatively to that item (indicating that they had engaged in that risk behaviour). The decision to regard the missing values as "no" responses thus implies that the estimates for the prevalence of the risk behaviours are *conservative* in

that these prevalences would almost certainly have been higher if there were no missing values.

In this thesis, the data are reported by standard and gender; and language(s) spoken at home and gender.

Data were not reported by standard, language(s) spoken at home, and gender as the smaller cell sizes would in some cases make the data difficult to interpret. Furthermore, data were not reported by age *and* by standard as similar trends would be revealed by either method. Standard was chosen in preference to age as this is more likely to be useful for planning interventions as these would be targeted to particular standards and not particular ages. The ages corresponding to particular standards are not equivalent across the education departments; students in DET schools tend to be older than those in the other departments.

As regards the language(s) spoken at home, students were asked to indicate which of the following languages were spoken at home: English, Afrikaans, Xhosa, and other. For the purposes of the analysis, it was decided to ignore the "other" category; for example, students who reported that they spoke English plus a language in the "other" category at home were grouped together with those who indicated that they spoke only English at home. Four language categories were then created: Afrikaans, Afrikaans and English, English, and Xhosa. Of those who answered the relevant question, only 74 students do not fall into one of these categories.

As mentioned above, it was not permitted to report the data by education department, and students from different education departments (and hence population groups) could thus not be compared. The effects of this

are mitigated by the fact that since the field work was carried out many schools have been admitting increasing numbers of students that would previously have attended schools administered by other departments. This aspect will receive further attention in the Discussion of this thesis.

The results are reported in the form of the prevalence of the behaviour and the 95% confidence interval. The prevalences determined from the sample are estimates of the true prevalences in the population from which the sample was drawn. An estimate of how close the calculated prevalence is from the true prevalence is given by the confidence interval. The 95% confidence interval is such that there is a probability of 0,95 that the interval includes the true prevalence (Flisher and Chalton, 1995).

The reason that prevalences and confidence intervals are reported as opposed to statistical tests to assess the significance of differences between population estimates are as follows.

- In many cases, the assumption of independence of samples cannot be made and there is no way of measuring the extent of the dependence of the samples. This is best exemplified by sexual intercourse. In comparing the proportions of boys and girls who have participated in sexual intercourse, one cannot assume that a boy's participating in sexual intercourse occurs independently of the girls in the sample since it is probable that a proportion of the boys in the sample have had coitus with girls in the sample. There is no way of measuring the extent of the dependence of the samples since the data were all provided anonymously.

- There are likely to be many confounding variables that would make comparison between different population estimates a misleading enterprise. A comparison between Xhosa-speaking students and English-speaking students, for example, may be confounded by the mean age of Xhosa-speaking students being higher than that of English-speaking students. Any differences may thus falsely be attributed to the language variable whereas they may be due to the age variable (Cohen and Cohen, 1983).

- Tests for statistical significance yield *p* values that reflect both the size of the differences investigated and the size of the samples. Large *p* values can result from small differences in the relevant variables, small sample sizes, or both; conversely, small *p* values can result from large differences in the relevant variables, large sample sizes, or both (Vanderschmidt *et al.*, 1993). The use of confidence intervals allows one to separate the contributions of effect size (in other words, the magnitude of the differences in the relevant variables) and sample size (Gardner and Altman, 1990; Vanderschmidt *et al.*, 1993). The effect size is reflected in the location of the confidence interval and the sample size (*inter alia*) is reflected in the width of the confidence interval. Confidence intervals thus provide more meaningful information than tests of statistical significance (Cohen, 1995). The use of confidence intervals is consistent with current trends in medical statistics in that the emphasis has swung from hypothesis testing to estimation of population parameters (McGuigan, 1995).

- Finally, the *p* values associated with null hypothesis significance testing are usually interpreted in terms of whether the

differences are statistically "significant" or not (Vanderschmidt *et al.*, 1993). The level of *p* to be used as a cut-off point is arbitrary, but it is frequently set at 0.05, 0.01, or 0.001. Thus, there is no way of differentiating a value that is slightly less than the significance level from one that is slightly more than it. This has the potential for similarities to be overlooked. The converse scenario could also occur, whereby differences are overlooked. These similarities would however be apparent on inspecting the confidence intervals (Cohen, 1995).

5.2 Objective 2

As mentioned in the section 5.1 above, Objective 2 of the study was to investigate whether the notion of a syndrome of adolescent risk behaviour is valid for high-school students in the Cape Peninsula and to investigate whether suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome.

It was argued in the Literature Review that there is substantial evidence for the inclusion of the following behaviours in the syndrome of adolescent risk behaviour: alcohol misuse, cannabis smoking, sexual intercourse, "general deviance", and cigarette smoking. If it can be demonstrated that there are significant bivariable relationships between all possible pairs of these risk behaviours, this would confirm that the notion of a syndrome of adolescent risk behaviour is valid for high-school students in the Cape Peninsula. Furthermore, if it can be shown that there are significant bivariable relationships between each of these behaviours and suicidal behaviour and behaviour exposing oneself to risk of physical injury, and also between suicidal behaviour and behaviour exposing oneself to risk of

physical injury, this would confirm that it is valid to include these latter risk behaviours in the syndrome of adolescent risk behaviour.

The definitions of the eight variables included in this analysis are provided in Table 3.3. Specifically, the following were included:

- the risk behaviours for which a substantial amount of evidence exists justifying their inclusion in a syndrome of adolescent risk behaviour, *viz.* problem drinking, cannabis use, having had sexual intercourse, and "general deviance" (which was defined in terms of carrying a knife to be used as a weapon), and cigarette smoking;

- suicidal behaviour, defined by having attempted suicide in the previous 12 months; and

- two items assessing behaviour exposing oneself to risk of physical injury: not wearing a seat belt while travelling in a motor vehicle, and going out at night beyond the neighbourhood and walking home alone (the former assessed exposure to injury from motor vehicle accidents and the latter to interpersonal violence).

Table 3.3 *Risk behaviours included in the analysis involving bivariate relationships between pairs of risk behaviours*

Variable number	Definition
1.	Having 5 or more drinks on at least one occasion in the previous 14 days
2.	Ever having smoked cannabis
3.	Ever having had heterosexual vaginal intercourse
4.	Having carried a knife to school to be used as a weapon during the previous 4 weeks
5.	Currently smoking at least one cigarette per day
6.	Attempting suicide in the previous 12 months
7.	Not using a seat belt on the last occasion when travelling in the front passenger seat of a motor vehicle
8.	Going out at night beyond the neighbourhood and walking home alone during the previous 4 weeks

The relationships between the risk behaviours were demonstrated by means of *unadjusted odds ratios*. The *odds* in favour of an outcome are defined as the ratio of the expected number of occurrences of an outcome to the expected number of non-occurrences of the outcome, and the odds *ratio* is defined as the ratio of the odds of an outcome's occurrence given the presence of a predictor to the odds of the outcome's occurrence given the absence of the predictor (Kachigan, 1986). (Of course, in the present analysis, the terms "predictor" and "occurrence" are not really applicable since no assumptions are made about the direction of any causal relationships between the variables, if such causality exists).

The odds ratio calculated from the data is an estimate of the true odds ratio in the population from which the sample was drawn. A 95% confidence interval is provided for each estimate, which is such that there is a probability of 0,95 that the interval includes the true odds ratio.

The analysis was stratified according to gender since there were differences between the genders for the prevalence of most forms of risk behaviour (see Chapter 4 below).

3.5.3 Objective 3

Objective 3 of the study was to investigate the relationships between various risk behaviours, taking into account their influence upon one another.

This objective was addressed by using a stepwise logistic regression procedure, which describes the relationship between a categorical

response (dependent) variables and a set of explanatory (independent) variables (Stokes *et al.*, 1995). As in most cases, the dependent variable in the present study is dichotomous; a value of 1 was assigned if the student engaged in the risk behaviour and a value of 0 was assigned if this was not the case. The independent variables were coded in the same manner. (Details about the dependent and independent variables included in the models are provided below.)

In a *stepwise* logistic regression model, terms are added or subtracted according to a criterion of statistical significance that is related to the extent to which the fit of the model is affected by the loss or gain of the next term (Rothman, 1986). A probability of 0,01 was used as entry criterion; this relatively strict criterion was employed to minimise Type I statistical error (Kachigan, 1986).

Odds ratios were obtained by exponentiating the estimated logistic regression coefficients. An odds ratio is declared significant if the ratio is significantly different from a value of one. This was determined using Student's *t*-test to test the natural logarithm of the odds ratio against a value of 0 (Fleiss, 1981). The odds ratios are adjusted for all the other explanatory variables in the model.

As for the odds ratios in Objective 2, 95% confidence intervals were calculated for each estimate (Fleiss, 1981).

Separate analyses were conducted for each gender. The dependent variables were the eight variables included in the analysis described for Objective 2 above. Thus, 16 logistic regression procedures were carried out; one for boys and one for girls for each of these dependent variables.

There were 26 independent variables for each logistic regression model. These comprised the following:

- the seven variables serving as dependent variables for the other stepwise logistic regression models; and

- the remaining 19 risk behaviours for which prevalence data are provided in terms of Objective 1 of the study **and** for which *all* the respondents were required to provide a Yes/No response.

All the respondents were required to provide a Yes/No response only to those items in the questionnaire that were not contingent on the response to a previous item. Thus, the item involving riding without a helmet in the previous 12 months was *not* included since the only students who were required to respond to this item were those who had responded affirmatively to the previous question (which was: *In the previous 12 months have you ridden on a motorbike or motorscooter as a passenger or a driver?)*

The variables included in the stepwise logistic regression procedures are listed in Table 3.4.

Table 3.4 *Variables included in the analysis involving multivariate relationships among pairs of risk behaviours; variables employed as dependent variables are in bold.*

Variable number	Definition
	Substance use
1.	• **Smoking at least one cigarette per day**
2.	• **Ever having smoked cannabis on its own**
3.	• Ever having smoked cannabis and Mandrax (methaqualone) together ("white pipes")
4.	• Ever having sniffed glue, petrol or thinners
5.	• Ever having used injectable drugs
6.	• **Having 5 or more drinks on at least one occasion in the previous 14 days**
	Sexual behaviour
7.	• **Ever having had sexual intercourse**
	Violent behaviour
8.	• Being physically injured by another pupil at school during the previous 12 months
9.	• Being physically injured by a member of staff (excluding corporal punishment) during the previous 12 months
10.	• Having physically injured another pupil at school during the previous 12 months
11.	• Having caused serious damage to property at school during the previous 12 months

12.	• Being physically injured by an adult at home during the previous 12 months
13.	• Being physically injured by anyone outside of home or school during the previous 12 months
14.	• Having physically injured anyone outside of home or school during the previous 12 months
15.	• Having caused serious damage to property outside of home or school during the previous 12 months
16.	• **Ever having carried a knife to school to be used as a weapon during the previous 4 weeks**
17.	• Going out at night beyond the neighbourhood without knowing how to get home during the previous 4 weeks
18.	• **Going out at night beyond the neighbourhood and walking home alone during the previous 4 weeks**
19.	• Going out at night beyond the neighbourhood and hitch-hiking home during the previous 4 weeks
	Suicidal behaviour
20.	• Seriously thinking about self harm in a way which might result in death during the previous 12 months
21.	• Ever having told anyone about an intention to end one's life during the previous 12 months
22.	• **Ever actually tried to end one's life during the previous 12 months**

	Road-related behaviour
23.	• Having ridden on a motorbike or motorscooter as a passenger or a driver in the previous 12 months
24.	• Being involved in an accident while travelling in a motor vehicle (excluding motor bikes) during the previous 12 months
25.	• Being injured by a motor vehicle, motorbike or bicycle while walking or standing during the previous 12 months
26.	• **Not using a seat belt on the last occasion while travelling in the front passenger seat of a motor vehicle**
27.	• Ever having driven a motor vehicle (excluding a motor bike) on a public road

Chapter 4

Chapter 4

RESULTS

Details of the sampling strategy were presented in the previous chapter. The current chapter will commence with a description of the sample that resulted from this sampling strategy. Thereafter, the results of the study will be presented under the following headings:

- Prevalences of risk behaviours;
- Bivariable relationships between behaviours; and
- Multivariable relationships between behaviours.

These three headings correspond to the three objectives of the study as listed in the previous chapter.

4.1 DETAILS OF THE SAMPLE

It is not possible to provide very much information about the schools that participated since this might allow their identity to be discerned. However, all the schools are co-educational in the sense that students of both genders are admitted. Of the schools falling under the HoA, three used Afrikaans as a medium of instruction, two used English and one used both languages. Both the schools that allowed only the abbreviated version of the questionnaire to be administered used Afrikaans as the medium of instruction. Of the schools falling under the HoR, one used Afrikaans as the medium of instruction and the rest used both English and Afrikaans.

Some details regarding the students in the schools in each department that participated in the study are presented below. Specifically, there are some comments about the students who completed the full version and the abbreviated version (in which questions concerning sexuality were omitted) of the questionnaire. Much of the data presented below has been presented in the previous chapter. However, it is repeated here to put the details of the participating students in context.

DET

Approximately 40% of the students in each school were selected.

Parental permission was not required for participation in the study by the students in this department. However, the Students' Representative Council (SRC) of one of the schools (School DET3) denied permission for the Standard 6 students to participate. All

participating students completed the full version of the questionnaire.

HoA

All the students in the schools from the HoA participated, except in the case of one school (School HoA8) it was not practically possible for the entire school to complete the questionnaire; every second student according to seating position in the register class participated.

At two of the schools (Schools HoA7 and HoA8), only the abbreviated version of the questionnaire (in which questions dealing with sexuality were excluded) was administered. At the other four schools, parental permission was required for the students to complete the full version of the questionnaire (including questions regarding sexuality).

HoR

Active or passive parental consent was required for the questionnaire to be completed at four of the schools (Schools HoR1, HoR2, HoR3, HoR5). The students whose parents did not give permission were excluded entirely from the study; unlike the students in the HoA whose parents did not give permission for completion of the full version of the questionnaire, they did *not* complete an abbreviated version of the questionnaire. It was decided that the relatively small numbers of students whose

parents denied permission for participation did not justify the substantial administrative effort that is necessary to distribute two versions of a questionnaire at a school.

Three questionnaires were discarded since it was obvious the responses of these students were not seriously intended. An additional 43 questionnaires were discarded since the students indicated that they had used the fictitious drug (Lovar 25).

The total number of students registered at all the schools at which the study took place was 12 540, of whom 7 340 (or 59%) completed either the full or the abbreviated version of the questionnaire. The percentage of 59% does *not* represent a response rate since not all the students were eligible for participation in the study for the reasons presented above.

4.1.1 Proportion of students in each education department

The numbers of students in each education department, together with the number and proportion of students selected from each department, are presented in Table 4.1.

4.1.2 Proportion of students from the participating schools who completed either version of the questionnaire

The response rates for each participating school are presented in Table 4.2. As mentioned in the chapter in which the methods of the study were presented, only a proportion of students at the schools administered by the DET completed the questionnaire. A random selection of classes

within each standard was made to obtain the desired proportion. Unfortunately, *none* of the schools involved was able to provide data as to the precise numbers of students in all of the selected classes, mainly because the questionnaires were in many cases administered during periods when non-examinable subjects are usually offered. It is thus not possible to provide an overall response rate for all the students selected for participation in the study.

There is a wide variation in the response rate between the schools in both the HoA and HoR. In the former department, the response rates were relatively low for Schools HoA5 and HoA6. This could be accounted for by the fact that the questionnaire was administered after the examinations had been completed at the end of the second school term; it is possible that there was a high rate of absenteeism during this period. In the latter department, there was a particularly high response rate for School HoR1 and a relatively low response rate for School HoR2. The fact that only three students at School HoR1 did not complete the questionnaire can be explained by the fact that the questionnaire was administered immediately prior to an examination being written. It is difficult to account for the relatively low response rate at School HoR2; however, since the questionnaire was administered to a large proportion of the school on a class-by-class basis, it is possible that some classes were inadvertently omitted from the study by the school.

Table 4.1 *Number of students in each education department, with the number and proportion of students selected from each education department*

Education department	Number of students in sample	Number of students in each department	Percentage of students selected
Department of Education and Training (DET)	1 461	17 600	8,3
Department of Education and Culture of the House of Assembly (HOA)	2 032	72 181	2,8
Department of Education and Culture of the House of Representatives (HOR)	3 847	72 898	5,3
Total	7 340	162 679	4,5

*Table 4.2 Response rates for **either version** of the questionnaire* (see text for comments)

School/ education dept.	No. of students registered at the school	No. of students eligible to complete questionnaire	No. of questionnaires completed	Response rate (%) w.r.t. the no. of students registered	Response rate (%) w.r.t. the no. of eligible students
DET:					
• DET 1	848	Unknown	206	24	Unknown
• DET 2	1 175	Unknown	365	31	Unknown
• DET 3	1 113	Unknown	329	30	Unknown
• DET 4	1 565	Unknown	561	36	Unknown
• **Total**	4 701	Unknown	1 461	31	Unknown
HoA:					
• HoA 5	240	240	147	61	61
• HoA 6	250	250	155	62	62
• HoA 7	475	475	444	93	93
• HoA 8	1 050	525	481	46	92
• HoA 9	192	192	184	96	96
• HoA 10	770	770	621	81	81
• **Total**	2 977	2 452	2 032	68	83
HoR:					
• HoR 1	892	630	627	70	100
• HoR 2	724	712	480	66	67
• HoR 3	747	747	643	86	86
• HoR 4	798	798	685	86	86
• HoR 5	971	874	781	80	89
• HoR 6	730	730	631	86	86
• **Total**	4 862	4 491	3 847	79	86

4.1.3 Proportion of students from the participating schools who completed the full version of the questionnaire

The response rates for the full version of the questionnaire with respect to both the total number of students registered and the number of students who were eligible to complete the full version of the questionnaire are presented in Table 4.3.

It can be deduced from this table that, with one exception, the number of the full versions of the questionnaire (in which questions dealing with sexuality were included) was fewer than the number of students whose parents gave permission to complete this version. There are several possible reasons for this, including:

- the students themselves may have chosen not to complete the questionnaire;

- students may unintentionally have omitted to complete the first question in Part 3 in which they are asked if they have experienced sexual intercourse, which would result in the remainder of that section being invalid since all the remaining questions in that section were dependent on this question; and

- some students whose parents gave permission for them to complete the full version of the questionnaire may not have received it owing to administrative problems at the schools on the days the questionnaires were completed; the anonymity of the questionnaire responses made it impossible to calculate the extent to which this occurred.

At one school (School HoA9), there was a greater number of the full versions of the questionnaire received than the number of students whose parents gave permission for this version to be completed! At this school, the principal arranged for all those who had permission for the full version to be completed to be located in one classroom during the period when the questionnaire was completed. It was only in this classroom that full versions of the questionnaire were available. It is thus probable that additional students were present in this classroom while the full version of the questionnaire was being completed.

4.1.4 Proportions of students completing the full version of the questionnaire relative to the proportions who completed the abbreviated version

Another perspective on the representativeness of the students completing the full version of the questionnaire is provided by the proportion of the number of students who completed the full version of the questionnaire relative to the number of students completing either version of the questionnaire. These proportions for each school and education department are presented in Table 4.4.

4.1.5 Proportions of students in each demographic subgroup who completed either version of the questionnaire

Of the 7 340 students who participated in the study, 3 269 were male, 3 981 were females, and 90 were of unknown gender. A breakdown of the sample by standard and language(s) spoken at home is provided in Table 4.5.

*Table 4.3 Response rates for the **full version** of the questionnaire* (see text for comments)

School/ educaton dept.	No. of students registered at the school	No. of students eligible to complete the **full** quest'naire	No. of **full** questionnaires completed	Response rate (%) w.r.t. the no. of students registered	Response rate (%) w.r.t. the no. of eligible students
DET:					
• DET 1	848	Unknown	206	24	Unknown
• DET 2	1 175	Unknown	365	31	Unknown
• DET 3	1 113	Unknown	329	30	Unknown
• DET 4	1 565	Unknown	561	36	Unknown
• **Total**	4 701	Unknown	1 461	31	Unknown
HoA:					
• HoA 5	240	44	32	13	73
• HoA 6	250	171	148	59	87
• HoA 7	475	0	0	0	-
• HoA 8	1 050	0	0	0	-
• HoA 9	192	34	50	26	147
• HoA 10	770	562	553	72	98
• **Total**	2 977	811	783	26	97
HoR:					
• HoR 1	892	630	609	68	97
• HoR 2	724	712	464	64	65
• HoR 3	747	747	613	82	82
• HoR 4	798	798	657	82	82
• HoR 5	971	874	731	75	84
• HoR 6	730	730	606	83	83
• **Total**	4 862	4 491	3 680	76	82

Table 4.4 *Proportion of full versions of the questionnaire completed in relation to all questionnaires completed for each school and education department*

School/ education department	Total number of questionnaires (i.e. including the abbreviated *and* full versions)	Number of full versions of the questionnaire	Proportion of full versions in relation to the total number of questionnaires (%)
DET:			
• DET 1	206	206	100
• DET 2	365	365	100
• DET 3	329	329	100
• DET 4	561	561	100
• **Total**	1 461	1 461	100
HoA:			
• HoA 5	147	32	22
• HoA 6	155	148	95
• HoA 7	444	0	0
• HoA 8	481	0	0
• HoA 9	184	50	27
• HoA 10	621	553	89
• **Total**	2 032	783	39
HoR:			
• HoR 1	627	609	97
• HoR 2	480	464	97
• HoR 3	643	613	95
• HoR 4	685	657	96
• HoR 5	781	731	94
• HoR 6	631	606	96
• **Total**	3 847	3 680	96

Table 4.5 Number of students in final sample by standard and language(s) spoken at home, and gender (N=7340)

	Males	Females	Gender unknown
Standard			
6	763	895	20
7	797	888	28
8	624	838	17
9	559	786	14
10	467	531	5
Standard unknown	59	43	6
Language(s)			
Afrikaans	1 301	1 487	25
Afrikaans and English	676	723	9
English	743	831	7
Xhosa	506	896	37
Any other combination	35	36	3
Language unknown	8	8	9

4.2 PREVALENCES OF RISK BEHAVIOURS

Objective 1 of the study is as follows.

> *To obtain estimates of the prevalence of risk behaviours in the following domains according to school standard and home language(s), and gender.*

In this section, the results that address this objective are presented.

4.2.1 Suicidal behaviour

a) Suicidal ideation

Of the total sample, 19% (95% CI.: 16,9 - 21,0) had in the previous 12 months seriously thought about harming themselves in a way that might result in their death. There was a greater proportion of females than males who had experienced these suicidal thoughts for each standard and language (Table 4.6).

For boys, the percentage with suicidal thoughts increased from standard 6 to standard 9 before declining. For girls, this pattern was not present. For both males and females, Xhosa-speaking students had the lowest prevalence of suicidal thoughts. The rank order from highest to lowest incidence for both genders with regard to language was as follows: *(i)* Afrikaans and English; *(ii)* English; *(iii)* Afrikaans; and *(iv)* Xhosa.

Table 4.6 *Percentages (with 95% confidence intervals) of students who during the previous 12 months had seriously thought about harming themselves in a way which might result in their death, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**11,6** (9,3 - 13,8)	**19,9** (15,2 - 24,6)
7	**12,8** (10,4 - 15,2)	**22,0** (19,6 - 24,4)
8	**16,1** (12,2 - 20,0)	**25,6** (23,1 - 28,0)
9	**16,8** (12,9 - 20,7)	**24,5** (20,8 - 28,1)
10	**15,5** (10,7 - 20,2)	**24,9** (21,0 - 28,8)
Language(s)		
Afrikaans	**11,6** (10,2 - 13,0	**20,5** (17,4 - 23,7)
Afrikaans and English	**18,6** (15,1 - 22,1)	**30,7** (27,0 - 34,3)
English	**16,7** (13,2 - 20,1)	**26,8** (22,0 - 31,6)
Xhosa	**8,4** (5,6 - 11,3)	**12,9** (11,2 - 14,6)

* No. of missing responses = 50

b) Communicating suicidal intent

Of the total sample, 12,4 % (95% CI.: 11,1 - 13,8) had in the previous 12 months told someone that they intended to put an end to their life. Of these, 75,8% had in the same time period seriously thought about ending their life while 24,2% had not.

The trends were similar to those for the above item involving suicidal thoughts (Table 4.7).

c) Suicidal attempts

Of the total sample, 7,8% (95% CI: 6,2 - 9,4) had in the previous 12 months actually tried to put an end to their life. Of these, 85,7% had in the same time period seriously thought about harming themselves in a way that might result in their death while 14,3% had not. Similarly, 57,7% had told someone that they intended putting an end to their life while 42,3% had not.

Table 4.7 *Percentages (with 95% confidence intervals) of students who during the previous 12 months had told someone they intended putting an end to their life, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**7,0** (4,6 - 9,3)	**12,2** (9,0 - 15,4)
7	**7,9** (6,1 - 9,7)	**16,7** (14,2 - 19,3)
8	**9,8** (7,5 - 12,1)	**16,3** (13,1 - 19,5)
9	**11,2** (8,1 - 14,3)	**15,6** (12,7 - 18,6)
10	**10,7** (7,2 - 14,2)	**17,2** (13,6 - 20,9)
Language(s)		
Afrikaans	**7,7** (6,5 - 9,0)	**15,1** (13,3 - 17,0)
Afrikaans and English	**13,3** (10,3 - 16,3)	**22,6** (19,3 - 25,8)
English	**9,1** (6,7 - 11,6)	**16,2** (12,6 - 19,7)
Xhosa	**4,6** (3,5 - 5,7)	**5,1** (4,3 - 5,9)

* No. of missing responses = 59

Again, more females than males had made an attempt for each standard and language group (Table 4.8). There are important differences for the other trends between this item and the previous items, which are mentioned below.

- For boys, the percentage of students who had in the previous 12 months attempted to put an end to their life decreased from standard 6 to standard 10. For girls, the percentage reached a peak at standard 7 before declining to standard 10. This contrast with the trends for the items involving suicidal thoughts and communicating suicidal intent. For boys for these two items, the prevalence increased to reach a peak at standard 9 before declining, while for girls for these two items there were no consistent trends.

- The rank order for the prevalence of suicide attempts varied between the genders and differed from that for the previous two items. For boys, Xhosa-speakers did not have the lowest prevalence of suicide attempts. For girls, although Xhosa-speakers had the lowest prevalence of suicide attempts, the confidence intervals for their prevalence overlapped with those for the prevalences of all the other language groups.

Table 4.8 *Percentages (with 95% confidence intervals) of students who during the previous 12 months had actually tried to put an end to their life, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**6,1** (4,3 - 7,8)	**9,9** (6,4 - 13,4)
7	**5,7** (3,3 - 8,1)	**12,1** (8,8 - 15,4)
8	**5,1** (3,8 - 6,3)	**11,0** (8,7 - 13,3)
9	**4,4** (2,1 - 6,6)	**9,2** (6,6 - 11,8)
10	**2,9** (1,2 - 4,7)	**8,4** (5,8 - 10,9)
Language(s)		
Afrikaans	**5,5** (4,3 - 6,7)	**10,1** (7,9 - 12,3)
Afrikaans and English	**6,1** (3,9 - 8,3)	**10,1** (7,9 - 12,3)
English	**3,0** (1,0 - 5,0)	**9,4** (5,9 - 13,0)
Xhosa	**5,7** (4,8 - 6,6)	**7,8** (6,5 - 9,0)

* No. of missing responses = 54

4.2.2 Cigarette smoking

Of the total sample, 18,1% (95% CI: 15,7 - 20,5) reported that they smoke at least one cigarette per day, *i.e.* that they are regular smokers. There was a greater proportion of male than female regular smokers for each standard and language group (Table 4.9).

By standard 6, 10,2% (95% CI: 6,9 - 13,4) of students of both genders had acquired the habit. For males, the proportion increased rapidly to a peak of 32,3% at standard 9. For females, there was a more gradual tendency to increase with standard, with a peak of 20,7% at standard 10.

For Xhosa-speakers, there is a difference of 18,6% between the prevalences of regular smoking for males and females. This is considerably larger than the differences between the genders for the other language groups. This large difference can be ascribed mainly to the small numbers of Xhosa-speaking females who smoke regularly. For non-Xhosa speaking students, the rank order for the proportions of students smoking regularly from highest to lowest prevalence is: Afrikaans and English; English; and Afrikaans. This rank order applies to each gender.

Of regular smokers, 66,9% (95% CI: 62,9 - 70,9) indicated that they have tried to stop. The breakdown by standard and language group, and gender, is provided in Table 4.10. There were no obvious trends according to these demographic features.

Table 4.9 *Percentages (with 95% confidence intervals) of students who smoke at least one cigarette per day, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**11,7** (7,8 - 15,6)	**9,0** (5,8 - 12,2)
7	**19,3** (14,9 - 23,6)	**13,8** (12,1 - 15,5)
8	**27,0** (21,0 - 33,0)	**13,2** (9,5 - 16,9)
9	**32,3** (27,2 - 37,3)	**16,5** (12,9 - 20,1)
10	**27,6** (22,4 - 32,8)	**20,7** (16,3 - 25,0)
Language(s)		
Afrikaans	**19,1** (17,0 - 21,2)	**12,9** (11,0 - 14,9)
Afrikaans and English	**29,0** (24,8 - 33,3)	**19,8** (16,1 - 23,4)
English	**23,5** (15,7 - 31,4)	**18,2** (11,6 - 24,8)
Xhosa	**20,8** (16,5 - 25,1)	**2,2** (1,3 - 3,1)

* Number of missing responses = 79

*Table 4.10 Percentages (with 95% confidence intervals) of students who smoke at least one cigarette per day who have ever tried stopping, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**71,1** (69,1 - 85,1)	**60,8** (52,7 - 71,8)
7	**62,4** (54,8 - 70,0)	**71,8** (66,1 - 77,5)
8	**63,2** (57,9 - 68,4)	**61,0** (48,5 - 73,5)
9	**67,5** (62,7 - 72,3)	**64,5** (55,9 - 73,0)
10	**71,7** (61,1 - 82,3)	**71,8** (63,4 - 80,3)
Language(s)		
Afrikaans	**71,8** (69,5 - 74,2)	**67,9** (58,3 - 77,4)
Afrikaans and English	**67,4** (56,8 - 78,0)	**67,8** (58,4 - 77,3)
English	**64,3** (58,6 - 78,0)	**56,4** (47,6 - 65,1)
Xhosa	**67,8** (55,5 - 80,1)	**75,0** (56,4 - 93,5

* Number of missing responses = 11

Of those who are not regular smokers, 41,2% (95% CI: 36.8 - 45,5) are infrequent or ex-smokers. For each standard and language category, a greater proportion of males than females are infrequent or ex-smokers (Table 4.11). There was a trend for this proportion to increase with standard for each gender. A smaller proportion of Xhosa-speaking respondents were infrequent or ex-smokers; this applies particularly to females.

Of those who denied regular smoking, 3,6% (95% CI: 3,4 - 5,4) and 3,0% (95% CI: 2,2 - 3,7) respectively. There were no obvious trends with respect to standard or language group.

4.2.3 Alcohol use

The results for alcohol misuse will be presented separately for each of the following categories of alcohol use:

- lifetime use;
- recent use (defined by use in the previous seven days);
- binge drinking (defined by drinking five or more drinks on one occasion).

*Table 4.11 Percentages (with 95% confidence intervals) of students who smoke at least one cigarette per day who have smoked previously, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**37,3** (33,3 - 41,2)	**25,1** (19,3 - 30,8)
7	**45,9** (39,9 - 52,0)	**36,4** (28,7 - 44,0)
8	**53,3** (44,9 - 61,7)	**38,5** (33,5 - 43,6)
9	**53,6** (46,7 - 60,5)	**41,5** (34,1 - 48,8)
10	**58,7** (53,6 - 63,8)	**44,4** (40,7 - 48,1)
Language(s)		
Afrikaans	**46,6** (42,5 - 50,8)	**35,7** (28,3 - 43,1)
Afrikaans and English	**47,6** (42,0 - 53,2)	**47,6** (41,5 - 53,6)
English	**58,5** (54,8 - 62,3)	**45,9** (43,1 - 48,7)
Xhosa	**25,3** (19,4 - 31,2)	**1,7** (1,0 - 2,4)

* Number of missing responses = 151

a) Lifetime use

Of the total sample, 53,2% (95% CI: 48,2 - 58,2) reported having ever drunk alcohol. A greater proportion of males than females for each standard and language group reported lifetime use and for each genders (Table 4.12). There was a trend for the prevalence of lifetime use of alcohol to increase with school standard, which would be expected. English-speaking students indicated the highest prevalence of lifetime use. The proportion of female Xhosa-speaking students who had used alcohol was low in relation to females speaking other languages.

b) Recent use

Of the students, 26,2% (95% CI: 23,6 - 28,8) had used alcohol at least once in the previous seven days. There were more males than females involved in each standard and language group (Table 4.13).

For boys, there was a trend for the prevalence to increase with standard. For girls, there was a similar trend, except from standard 7 to 8. However, the gradient of the increase was greater for boys than girls; for boys, the prevalence increased from 15,5% to 47,8% whereas for girls it increased from 12,8% to 32,0%.

For each gender, the prevalence of recent use was higher for English-speaking students than those speaking other languages. A relatively small proportion of the Xhosa-speaking girls reported recent alcohol use; only 7,7% reported having done so whereas the proportion for those speaking English and Afrikaans at home (for whom the prevalence of recent alcohol use was next highest) was 22,1%.

*Table 4.12 Percentages (with 95% confidence intervals) of students who had ever used alcohol, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**40,2** (34,9 - 45,6)	**32,5** (27,2 - 37,9)
7	**56,2** (51,2 - 61,2)	**43,8** (37,0 - 50,6)
8	**66,5** (58,1 - 74,8)	**47,0** (40,2 - 53,7)
9	**70,4** (62,7 - 78,0)	**57,6** (51,8 - 63,4)
10	**79,8** (74,4 - 85,2)	**61,0** (56,3 - 65,7)
Language(s)		
Afrikaans	**57,0** (52,1 - 61,9)	**47,5** (40,2 - 54,9)
Afrikaans and English	**58,3** (48,8 - 67,9)	**48,1** (37,9 - 58,3)
English	**71,7** (66,6 - 76,8)	**60,8** (56,2 - 65,3)
Xhosa	**49,8** (46,1 - 53,5)	**16,7** (14,5 - 19,0)

* Number of missing responses = 160

*Table 4.13 Percentages (with 95% confidence intervals) of students who had used alcohol at least once in the previous 7 days, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**15,5** (13,0 - 18,0)	**12,8** (9,3 - 16,3)
7	**27,6** (24,5 - 30,7)	**21,1** (16,2 - 26,1)
8	**30,1** (23,5 - 36,6)	**20,3** (17,4 - 23,2)
9	**39,4** (34,9 - 43,8)	**30,6** (27,4 - 33,8)
10	**47,8** (39,9 - 55,7)	**32,0** (27,7 - 36,3)
Language(s)		
Afrikaans	**28,1** (24,4 - 31,8)	**23,7** (20,0 - 27,3)
Afrikaans and English	**27,0** (22,0 - 32,1)	**22,1** (16,7 - 27,5)
English	**37,7** (35,9 - 39,5)	**28,2** (25,2 - 32,2)
Xhosa	**29,2** (25,5 - 32,9)	**7,7** (7,0 - 8,4)

* No. of missing response = 160

Of the sample, 2,4% (95% CI: 2,0 - 2,8) indicated that they had used alcohol on four or more occasions in the previous week. The relatively small numbers involved necessitate caution in extracting trends. Notwithstanding this, as for those reporting any alcohol use in the previous week, there was a trend for the proportion of males who had used alcohol on four more occasions in the previous weeks to be greater than that for females (Table 4.14).

For males, there was a trend of increasing prevalence with standard; however, this trend was not present for females. For males, there were no discernible language trends for the use of alcohol on four or more occasions in the previous week. As for the results for those who had used any alcohol in the previous seven days, for females there was a trend for the proportion of Xhosa-speaking students who had done so to be lower than that of the other population groups.

*Table 4.14 Percentages (with 95% confidence intervals) of students who had used alcohol 4 or more times in the previous 7 days, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**2,0** (1,1 - 2,9)	**1,2** (0,5 - 2,0)
7	**3,1** (1,6 - 4,6)	**2,3** (0,5 - 4,0)
8	**3,3** (1,4 - 5,3)	**1,6** (0,4 - 2,7)
9	**3,4** (2,1 - 4,7)	**1,4** (0,4 - 2,4)
10	**4,3** (2,7 - 5,8)	**3,0** (1,8 - 4,3)
Language(s)		
Afrikaans	**2,6** (1,9 - 3,3)	**1,7** (0,8 - 2,6)
Afrikaans and English	**3,2** (1,8 - 4,6)	**1,3** (0,5 - 2,0)
English	**3,1** (2,4 - 3,8)	**2,7** (1,8 - 3,7)
Xhosa	**4,7** (2,3 - 7,1)	**0,9** (0,7 - 1,1)

* No. of missing responses = 160

c) Binge drinking

Among the entire sample, 15,4% (95% CI: 12,7 - 18,0) had 5 or more drinks on at least one occasion in the previous 14 days. There were proportionately more males than females involved in each standard and language group (Table 4.15).

For each gender, there was a trend for the prevalence of binge drinking in the previous fortnight to increase with standard. As for the item involving any use of alcohol in the previous seven days, the gradient of the increase was steeper for boys than girls; for boys, the prevalence of binge drinking in the previous fortnight increased from 8,0% in standard 6 to 33,7% in standard 10 whereas for girls it increased from 5,7% to 15,3%. Among females, there was a trend for the prevalence of binge drinking in the previous two weeks to be lower for Xhosa-speakers than for those speaking other languages.

Finally, 3,0% (95% CI: 2,4 - 3,6) of the total sample reported consuming five or more drinks on four or more occasions during the previous 14 days. Again, low numbers necessitate caution in interpreting the results. Notwithstanding this, there were more males than females involved for each standard and language group (Table 4.16).

The trends according to standard for having five or more drinks on four or more occasions in the previous 14 days varied according to gender. For boys, there was a trend for the prevalence to increase to a peak in standard 9. For girls there were no obvious trends in this regard.

*Table 4.15 Percentages (with 95% confidence intervals) of students who had had 5 or more drinks on one occasion at least once in the previous 14 days, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**8,0** (6,4 - 9,6)	**5,7** (3,0 - 8,3)
7	**16,0** (12,3 - 19,7)	**10,0** (6,7 - 13,4)
8	**21,1** (14,7 - 27,6)	**11,9** (8,3 - 15,5)
9	**29,9** (23,4 - 36,5)	**14,5** (11,9 - 17,0)
10	**33,7** (24,9 - 42,5)	**15,3** (10,9 - 19,7)
Language(s)		
Afrikaans	**15,4** (11,9 - 18,9)	**10,2** (8,9 - 11,5)
Afrikaans and English	**20,2** (15,1 - 25,2)	**12,4** (9,0 - 15,7)
English	**26,9** (22,9 - 30,9)	**14,7** (12,7 - 16,8)
Xhosa	**24,0** (21,0 - 27,0)	**5,0** (4,2 - 5,7)

* No. of missing responses = 160

*Table 4.16 Percentages (with 95% confidence intervals) of students who had had 5 or more drinks on one occasion 4 or more times in the previous 14 days, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**2,8** (1,9 - 3,6)	**1,3** (0,5 - 2,0)
7	**4,1** (3,0 - 5,1)	**2,1** (1,1 - 3,0)
8	**4,8** (3,5 - 6,2)	**1,5** (0,8 - 2,2)
9	**7,5** (4,6 - 10,5)	**1,8** (0,5 - 3,2)
10	**5,0** (3,0 - 6,9)	**1,9** (0,9 - 2,9)
Language(s)		
Afrikaans	**3,5** (2,3 - 4,7)	**1,7** (1,1 - 2,3)
Afrikaans and English	**5,3** (3,2 - 7,3)	**2,0** (0,7 - 3,3)
English	**4,6** (3,2 - 5,9)	**1,7** (1,2 - 2,2)
Xhosa	**8,4** (6,7 - 10,1)	**1,4** (1,1 - 1,8)

* No. of missing responses = 160

4.2.4 Drug use

The results for drug use will be presented in the following order: *(i)* cannabis;*(ii)* cannabis and methaqualone ("Mandrax"); *(iii)* solvents; and *(iv)* injectable and other drugs.

a) Cannabis

Of the total sample, 7,5% (95% CI: 5,7 - 9,3) reported that they had ever smoked cannabis. More males than females for each standard and language group had smoked cannabis (Table 4.17).

There was a trend for the prevalence of lifetime use of cannabis to increase with standard for each gender. The 95% confidence intervals for the lifetime prevalence of cannabis use for Xhosa-speaking males overlapped with those for boys speaking Afrikaans and English and those speaking English. However, the lifetime prevalence for Xhosa-speaking girls was less than that for girls speaking other languages.

Of the sample, 2,4% (95% CI: 1,8 - 3,0) reported recent use of cannabis, defined by use in the previous seven days. There were similarities and differences with regard to the trends for lifetime use. More males than females reported recent use for each standard and language group (Table 4.18).

*Table 4.17 Percentages (with 95% confidence intervals) of students who had ever used cannabis, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**4,1** (2,6 - 5,5)	**0,9** (0,0 - 1,8)
7	**7,2** (5,5 - 8,8)	**3,4** (1,5 - 5,3)
8	**12,2** (8,5 - 15,9)	**4,2** (2,3 - 6,1)
9	**17,5** (12,1 - 22,9)	**6,9** (3,8 - 10,1)
10	**18,2** (14,0 - 22,4)	**9,0** (6,6 - 11,3)
Language(s)		
Afrikaans	**8,2** (6,1 - 10,2)	**3,1** (2,1 - 4,0)
Afrikaans and English	**10,7** (7,4 - 14,0)	**4,6** (2,9 - 6,3)
English	**14,8** (10,2 - 19,5)	**8,5** (5,4 - 11,7)
Xhosa	**14,7** (12,8 - 16,6)	**0,8** (0,4 - 1,1)

* No. of missing responses = 154

*Table 4.18 Percentages (with 95% confidence intervals) of students who had used cannabis at least once in the previous seven days, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**2,6** (1,6 - 3,6)	**0,3** (0,0 - 0,5)
7	**3,6** (2,3 - 4,9)	**1,0** (0,2 - 1,8)
8	**4,8** (3,2 - 6,4)	**2,1** (0,5 - 3,7)
9	**4,3** (1,8 - 6,7)	**1,8** (0,9 - 2,7)
10	**3,4** (0,7 - 6,1)	**1,3** (0,5 - 2,2)
Language(s)		
Afrikaans	**2,7** (1,8 - 3,6)	**1,1** (0,6 - 1,7)
Afrikaans and English	**3,2** (1,5 - 4,8)	**1,4** (0,8 - 2,0)
English	**3,3** (1,3 - 5,3)	**1,8** (0,9 - 2,7)
Xhosa	**10,0** (7,1 - 12,9)	**0,7** (0,1 - 1,2)

* No. of missing responses = 154

There were peaks for recent cannabis use for both boys and girls in standard 8. Unlike the findings for lifetime use, Xhosa-speaking boys reported a relatively high prevalence of recent use of 10,0%. The group of boys with the second-highest prevalence of recent cannabis smoking was those speaking English, and their prevalence of recent use was only 3,3%. Among the girls, those speaking Xhosa reported the lowest prevalence of recent use, although the 95% confidence intervals for this prevalence overlapped with those for the prevalences of girls in each of the other language groups.

A relatively large proportion of Xhosa-speaking males reported smoking cannabis on 4 or more occasions during the previous 7 days; 5,9% (95% CI: 3,9 - 7,8) of this group reported having done so, compared to less than 1,8% of every other standard/gender and language/gender group.

b) Cannabis and methaqualone ("Mandrax")

Of the total sample, 1,6% (95% CI: 0,9 - 2,4) reported having used cannabis and methaqualone together. There was a trend for males to have a higher lifetime prevalence of smoking cannabis and methaqualone together than females for each standard and language group, although the low prevalences and the fact that the 95% confidence intervals frequently overlapped indicate that this trend should be interpreted with caution (Table 4.19). There were no discernible trends according to standard and language group.

Among Xhosa-speaking males, 2,3% (95% CI: 1,5 - 3,3) reported smoking cannabis and Mandrax together at least once in the past 7 days. For each other language/gender subgroup, less than 1% of the sample reported recent use.

*Table 4.19 Percentages (with 95% confidence intervals) of students who have ever smoked cannabis and methaqualone together, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**1,7** (0,9 - 2,4)	**0,3** (0,0 - 0,6)
7	**1,8** (1,1 - 2,6)	**0,8** (0,1 - 1,5)
8	**3,7** (1,0 - 6,5)	**0,5** (0,0 - 1,1)
9	**3,2** (1,7 - 4,8)	**1,0** (0,3 - 1,6)
10	**3,7** (1,0 - 6,6)	**0,8** (0,0 - 1,6)
Language(s)		
Afrikaans	**2,3** (1,0 - 3,6)	**0,2** (0,0 - 0,5)
Afrikaans and English	**3,0** (1,2 - 4,8)	**1,3** (0,6 - 2,0)
English	**3,1** (0,0 - 6,2)	**1,1** (0,3 - 2,0)
Xhosa	**3,1** (2,1 - 4,1)	**0,2** (0,0 - 4,0)

* No. of missing responses = 200.

c) Solvents

Of the sample, 10,9% (95% CI: 7,0 -14,7) had previously sniffed glue, petrol or thinners. More males than females for each standard and language group reported lifetime use (Table 4.20). For both boys and girls, the prevalence of lifetime use of solvents increased with standard. The prevalence of lifetime solvent use was highest among students whose home language was English. There was a trend for Xhosa-speaking students to be less likely than those speaking other languages to have ever used solvents. This was particularly conspicuous for females, where there was no overlap between the 95% confidence intervals for the prevalence of those speaking Xhosa and those speaking any other languages.

Of all the students, 2,6% (95% CI: 1,8 - 3,3) reported recent solvent use, defined by solvent use in the previous seven days Table 4.21). There was a trend for this prevalence to be higher for boys than girls for each standard and home language, although the differences were small and the prevalences were small. Fewer standard 10 students than those in other standards reported recent solvent use. Although the 95% confidence intervals for the prevalence of recent solvent use for girls in standard 10 overlapped with those of other standards, this was not the case for boys where there was no overlap between the 95% confidence intervals for those in standard 10 and those in any other standards. There was a low prevalence of recent solvent use among Xhosa-speaking females, although some of the relevant 95% confidence intervals did overlap.

In terms of heavy solvent use, 0,5% (95% CI: 0,3 - 0,8) indicated that they had sniffed solvents 3 or more times in the past 7 days.

*Table 4.20 Percentages (with 95% confidence intervals) of students who have ever sniffed solvents, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**7,3** (4,2 - 10,3)	**7,2** (3,9 - 10,5)
7	**11,6** (7,0 - 16,3)	**9,1** (5,7 - 12,6)
8	**11,9** (7,4 - 16,4)	**9,1** (5,9 - 12,3)
9	**16,8** (10,4 - 23,2)	**10,4** (3,3 - 17,5)
10	**16,8** (11,5 - 22,1)	**12,6** (7,3 - 17,9)
Language(s)		
Afrikaans	**7,4** (5,8 - 9,0)	**4,9** (3,1 - 6,8)
Afrikaans and English	**10,4** (7,0 - 13,8)	**10,2** (7,3 - 13,2)
English	**23,5** (20,8 - 26,2)	**20,1** (16,1 - 24,1)
Xhosa	**8,1** (3,4 - 12,9)	**0,8** (0,6 - 1,0)

* No. of missing responses = 180

*Table 4.21 Percentages (with 95% confidence intervals) of students who have sniffed solvents at least once in the previous seven days, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**3,2** (1,8 - 4,6)	**2,1** (0,5 - 3,6)
7	**3,7** (2,1 - 5,4)	**3,6** (2,0 - 5,1)
8	**3,2** (2,3 - 4,0)	**2,2** (0,9 - 3,6)
9	**3,2** (1,4 - 5,0)	**1,6** (0,4 - 2,7)
10	**0,4** (0,0 - 1,1)	**0,8** (0,0 - 1,6)
Language(s)		
Afrikaans	**1,5** (0,7 - 2,3)	**1,4** (0,9 - 2,0)
Afrikaans and English	**2,9** (1,5 - 4,4)	**2,4** (1,4 - 3,3)
English	**5,0** (4,3 - 5,7)	**4,0** (2,7 - 5,4)
Xhosa	**4,1** (1,1 - 7,1)	**0,1** (0,0 - 1,6)

* No. of missing responses = 180

d) Injectable and other drugs

Reported lifetime use of injectable drugs was 0,5% (95% CI: 0,3 - 0,7). Of the total sample, 0,2% (95% CI: 0,1 - 0,3) had used them at all in the previous week. Less than 0,5% of the sample indiacted that they had ever used other drugs such as cocaine, opium, LSD, and heroin.

4.2.5 Road-related behaviour

The results for road-related behaviour will not be presented in the order corresponding to that of the questionnaire. Furthermore, the items will be grouped in a different manner. The results will be reported under the following sub-headings:

- motorcycle riding and helmet use;
- motor vehicle accidents;
- pedestrian accidents;
- risk behaviour related to the use of motor vehicles: *(i)* seat-belt use; *(ii)* driving without a license; *(iii)* vehicle overcrowding; and *(iv)* alcohol and cannabis.

a) Motorcycle riding and helmet use

Of the total sample, 32,5% (95% CI: 28,5 - 36,4) had ridden a motorcycle as a passenger or a driver during the previous year (Table 4.22). *Of these students*, 47,9% (95% CI: 44,2 - 51,6) reported doing so without a helmet in this time period (Table 4.23).

Boys were more likely to engage in the risk behaviour indicated by each of these two items. For each standard and language, not only were they more likely to have ridden a motorcycle in the previous 12 months but (of those who had done so) they were more likely to have ridden without a helmet.

Conversely, Xhosa-speaking students were less likely to engage in the risk behaviour described in each of these two items. They are considerably less likely to have ridden a motorcycle in the previous 12 months. Those who had done so were less likely not to have used a helmet; for boys, there was no overlap between the relevant confidence intervals whereas for girls there was only one relevant overlapping pair of 95% confidence intervals.

b) Motor vehicle accidents

Of the entire sample, 8,5% (95% CI: 7,3 - 9,6) had been involved in an accident while travelling in a motor vehicle during the previous 12 months. For each standard and language group, there was a trend for males to be more likely to have been involved in such an accident (Table 4.24). For boys, there was an increase in motor vehicle accident involvement with standard, which was not observed for girls.

*Table 4.22 Percentages (with 95% confidence intervals) of students who during the previous 12 months had ridden on a motorcycle as a passenger or driver, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**31,7** (27,3 - 36,0)	**23,4** (18,8 - 28,1)
7	**34,0** (30,3 - 37,7)	**22,7** (18,9 - 26,5)
8	**37,1** (30,4 - 43,9)	**27,0** (20,8 - 33,3)
9	**45,7** (38,9 - 52,4)	**31,8** (25,3 - 38,4)
10	**55,1** (48,4 - 61,7)	**27,0** (22,6 - 31,3)
Language(s)		
Afrikaans	**41,2** (36,7 - 45,7)	**31,7** (27,6 - 35,8)
Afrikaans and English	**40,0** (34,7 - 45,2)	**27,4** (23,4 - 31,3)
English	**46,7** (44,9 - 48,5)	**27,3** (25,7 - 28,8)
Xhosa	**4,4** (3,8 - 5,1)	**4,0** (3,2 - 4,9)

* No. of missing responses = 63

*Table 4.23 Percentages (with 95% confidence intervals) of students who did not use a helmet on the last occasion on a motorcycle, for those students who had in the previous 12 months had ridden on a motorcycle as a passenger or driver, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**45,3** (38,3 - 52,3)	**45,1** (39,0 - 51,3)
7	**49,9** (43,6 - 56,2)	**43,5** (38,0 - 49,0)
8	**54,9** (48,3 - 61,5)	**43,4** (36,5 - 50,4)
9	**53,3** (42,1 - 64,6)	**43,3** (33,9 - 52,7)
10	**52,4** (44,9 - 60,0)	**44,5** (35,7 - 53,4)
Language(s)		
Afrikaans	**55,7** (51,8 - 59,7)	**55,5** (51,7 - 59,7)
Afrikaans and English	**51,6** (42,3 - 61,0)	**36,1** (26,1 - 46,2)
English	**52,7** (46,5 - 58,9)	**45,3** (39,2 - 51,4)
Xhosa	**20,3** (15,1 - 25,5)	**19,7** (8,0 - 31,4)

* No. of missing responses = 104

*Table 4.24 Percentages (with 95% confidence intervals) of students who during the previous 12 months had been involved in an accident while travelling in a motor vehicle (excluding motorcycles), by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**7,3** (5,5 - 9,0)	**5,9** (5,0 - 6,9)
7	**9,3** (7,5 - 11,0)	**6,0** (4,6 - 7,4)
8	**10,5** (8,0 - 13,0)	**6,9** (4,8 - 8,9)
9	**12,2** (9,8 - 14,7)	**6,4** (4,6 - 8,3)
10	**14,9** (12,8 - 17,0)	**9,5** (6,8 - 12,1)
Language(s)		
Afrikaans	**9,2** (7,8 - 10,6)	**4,9** (4,1 - 5,6)
Afrikaans and English	**11,6** (9,1 - 14,1)	**9,0** (6,4 - 11,6)
English	**13,6** (12,6 - 14,6)	**9,0** (6,4 - 11,5)
Xhosa	**4,4** (3,8 - 5,1)	**4,0** (3,2 - 4,9)

* No. of missing responses = 124

Xhosa-speaking students were less likely to have been involved in an accident while travelling in a motor vehicle in the previous 12 months than those speaking other languages; for boys, there was no overlap between the relevant confidence intervals whereas for girls there was only one relevant overlapping pair of 95% confidence intervals. From the available data it is not possible to determine the extent to which this finding can be ascribed to a lower proportion of Xhosa-speaking students having travelled in a motor vehicle in the previous 12 months.

c) Pedestrian accidents

In the previous 12 months, 7,4% (95% CI: 6,1 - 8,7) of the total sample reported that they had been injured by a motor vehicle, motorbike or bicycle while walking or standing. For each standard and home language(s), a higher proportion of male than female students had been injured in this manner (Table 4.25).

There was a trend for the proportion of boys who had been involved in pedestrian accidents in the previous year to decrease with standard. For girls, this trend was not manifest to the same degree. There were no meaningful trends with respect to language group.

*Table 4.25 Percentages (with 95% confidence intervals) of students who during the previous 12 months had been injured by a motor vehicle, motorcycle or bicycle while walking or standing, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**11,3** (9,0 - 13,6)	**8,1** (6,4 - 9,9)
7	**10,9** (8,4 - 13,4)	**5,7** (4,1 - 7,3)
8	**8,5** (6,8 - 10,3)	**5,7** (4,0 - 7,3)
9	**6,6** (4,3 - 8,8)	**4,3** (3,1 - 5,6)
10	**5,5** (1,7 - 9,3)	**4,9** (2,9 - 6,9)
Language(s)		
Afrikaans	**7,7** (6,4 - 9,0)	**5,7** (4,2 - 7,2)
Afrikaans and English	**9,9** (6,8 - 13,1)	**5,8** (3,6 - 8,0)
English	**10,4** (8,2 - 12,6)	**7,0** (6,1 - 8,0)
Xhosa	**8,8** (7,2 - 10,4)	**3,4** (3,0 - 4,5)

* No. of missing responses = 130

d) Safety belt use

Although 78,5% (95% CI: 76,0 - 80,9) of students endorsed the safety value of seat belts, 62,7% (95% CI: 59,3 - 66,1) actually wore a safety belt on the last occasion they had travelled in the front seat of a motor vehicle; 58,9% (95% CI: 54,3 - 63,5) of male students and 66,0% (95% CI: 63,0 - 68,9) of females wore a safety belt.

e) Other risk behaviour related to the use of motor vehicles

The remaining questions concerned with road-related behaviour are concerned with travelling in motor vehicles or driving a motor vehicle (excluding a motor bike) on a public road. In the questionnaire, there were analogous questions for each scenario.

Of the total sample, 95,1% (95% CI: 93,8 - 96,3) had travelled in a motor vehicle during the previous year, and 32,1% (95% CI: 28,8 - 35,4) had ever driven a motor vehicle on a public road. The data below refer to those who had engaged in these activities.

Driving without a license

<u>As passengers</u>

Of the students who had travelled as a passenger in a motor vehicle, 29,8% (95% CI: 28,3 - 31,3) had in the previous 12 months travelled in a motor vehicle knowing or strongly suspecting that the driver did not

have a license. A greater proportion of boys than girls had done this, except for those in standard 7 and those speaking Xhosa at home (for whom the proportion of girls was marginally higher)(Table 4.26).

There was a tendency for this percentage to increase with standard from standard 7 to standard 10 for boys and from standard 6 to standard 10 for girls. For boys, there were no discernible trends according to language group. For girls, a higher proportion of Xhosa-speaking students had travelled in a motor vehicle knowing or strongly suspecting that the driver did not have a license than those speaking other languages.

As drivers

Of those who had ever driven a motor vehicle on a public road, 63,2% (95% CI: 58,1 - 68,2) had done so in the previous 12 months without a license. For each standard and home language(s), a higher proportion of males had engaged in this risk behaviour (Table 4.27).

For both males and females, the proportion of students who had driven a motor vehicle without being in possession of a license increased to standard 9 before declining. For both males and females, the proportion of Xhosa-speaking students who had driven a vehicle without a license was low in comparison to the other language groups.

*Table 4.26 Percentages (with 95% confidence intervals) of students who had travelled as a passenger in a motor vehicle during the previous 12 months who knew that the driver did not have a license, by standard and language(s) spoken at home, and gender (N=6 875)**

	Males	Females
Standard		
6	**26,3** (22,4 - 30,1)	**24,2** (17,4 - 31,0)
7	**25,5** (21,1 - 29,9)	**25,8** (22,8 - 28,8)
8	**33,1** (27,5 - 38,8)	**23,6** (21,2 - 26,0)
9	**40,7** (34,1 - 47,4)	**28,4** (24,9 - 31,9)
10	**48,1** (43,1 - 53,1)	**31,0** (26,8 - 35,2)
Language(s)		
Afrikaans	**33,8** (31,8 - 35,8)	**25,6** (22,5 - 28,8)
Afrikaans and English	**33,8** (28,3 - 39,3)	**24,8** (19,7 - 29,9)
English	**32,2** (29,5 - 35,0)	**23,4** (20,1 - 26,7)
Xhosa	**35,9** (33,6 - 38,3)	**37,2** (33,8 - 40,6

* No. of missing responses = 215

*Table 4.27 Percentages (with 95% confidence intervals) of students who had driven a motor vehicle during the previous 12 months who drove a vehicle without a license, by standard and language(s) spoken at home, and gender (N=2 116)**

	Males	Females
Standard		
6	**56,3** (50,0 - 62,7)	**35,1** (27,2 - 43,1)
7	**69,3** (61,7 - 76,9)	**50,4** (39,7 - 61,0)
8	**76,6** (71,3 - 81,8)	**58,7** (51,5 - 66,0)
9	**78,6** (73,2 - 84,0)	**69,7** (62,6 - 76,8)
10	**62,0** (57,3 - 66,7)	**48,3** (38,8 - 57,7)
Language(s)		
Afrikaans	**72,5** (66,0 - 79,0)	**57,9** (54,8 - 61,0)
Afrikaans and English	**71,9** (65,7 - 78,1)	**56,7** (46,9 - 66,4)
English	**67,0** (63,0 - 70,9)	**52,0** (47,3 - 56,7)
Xhosa	**45,8** (36,4 - 55,3)	**22,7** (14,9 - 30,4

* No. of missing responses = 51

As passengers

Among those in the sample who had travelled in a motor vehicle in the previous 12 months, 41,7% (95% CI: 39,0 - 44,4) had done so in this time period knowing or strongly suspecting that the vehicle was overcrowded. There were no major variations with respect to gender or language (Table 4.28). However, for both males and females the proportion who had done so increased with standard.

As drivers

Of the students who had ever driven a motor vehicle (excluding a motor bike) on a public road, 16,1% (95% CI: 15,1 - 17,1) reported having done so in this time period when the vehicle had been overcrowded. There were no consistent trends with respect to gender (Table 4.29).

There was no increase in the prevalence of driving an overcrowded motor with school standard. For males, there was no obvious trend according to standard for this risk behaviour. For females, there was a trend for the prevalence to decrease with increasing standard. Although the prevalence of this behaviour was higher for both boys and girls speaking Xhosa at home, it was only for the males that there was no overlap between the 95% confidence intervals for the prevalence for the Xhosa-speaking and those for students speaking other languages.

*Table 4.28 Percentages (with 95% confidence intervals) of students who had travelled in a motor vehicle as a passenger during the previous 12 months who knew that the vehicle was overcrowded, by standard and language(s) spoken at home, and gender (N=6 875)**

	Males	Females
Standard		
6	**31,2** (26,3 - 36,1)	**32,9** (28,0 - 37,8)
7	**38,1** (32,0 - 44,3)	**38,4** (36,1 - 40,7)
8	**41,9** (35,9 - 47,9)	**45,4** (39,9 - 50,9)
9	**46,7** (41,5 - 52,0)	**47,7** (43,0 - 52,3)
10	**52,7** (49,3 - 56,1)	**50,7** (46,8 - 54,7)
Language(s)		
Afrikaans	**39,8** (36,8 - 42,8)	**40,3** (35,9 - 44,8)
Afrikaans and English	**43,5** (39,0 - 48,0)	**43,3** (38,9 - 47,8)
English	**42,0** (39,9 - 44,0)	**44,9** (43,0 - 46,8)
Xhosa	**38,2** (34,2 - 42,3)	**42,9** (38,3 - 47,5

* No. of missing responses = 90

*Table 4.29 Percentages (with 95% confidence intervals) of students who had driven a motor vehicle during the previous 12 months who knew that the vehicle was overcrowded, by standard and language(s) spoken at home, and gender (N=2 116)**

	Males	Females
Standard		
6	**16,1** (10,2 - 22,0)	**23,5** (14,1 - 33,0)
7	**17,0** (14,7 - 19,2)	**20,8** (13,4 - 28,1)
8	**11,9** (8,4 - 15,7)	**15,8** (10,4 - 21,3)
9	**15,5** (12,5 - 18,6)	**10,9** (7,2 - 14,6)
10	**17,9** (13,0 - 22,8)	**7,6** (4,6 - 10,6)
Language(s)		
Afrikaans	**16,6** (12,8 - 20,4)	**13,8** (10,2 - 17,2)
Afrikaans and English	**16,6** (13,5 - 19,8)	**17,4** (13,5 - 21,3)
English	**11,2** (9,8 - 12,5)	**15,8** (13,5 - 18,0)
Xhosa	**32,2** (30,7 - 33,7)	**20,0** (13,5 - 26,6

* No. of missing responses = 51

As passengers

Of those who had travelled in a motor vehicle in the previous 12 months, 14,5% (95% CI: 12,3 - 16,7) reported that they h ad done so in the same time period knowing or strongly suspecting that the driver of that vehicle was affected by alcohol or cannabis. Differences between the genders were insubstantial (Table 4.30).

For both males and females, there was an increase in the prevalence of this risk behaviour with standard. There were no discernible trends with respect to language group.

As drivers

Of those who had ever driven a motor vehicle (excluding a motor bike) on a public road, 8,0% (95% CI: 6,3 - 9,7) had done so in the previous year while affected by alcohol or cannabis. The small numbers involved and the relatively large 95% confidence intervals make the detection of trends difficult (Table 4.31). Nonetheless, it would appear that there are no trends according to gender, home language, and school standard. The proportion of students in lower standards who had driven while under the influence of alcohol or cannabis was as large as in the higher standards.

*Table 4.30 Percentages (with 95% confidence intervals) of students who travelled in a motor vehicle as a passenger during the previous 12 months who knew that the driver was affected by alcohol or cannabis, by standard and language(s) spoken at home, and gender (N=6 875)**

	Males	Females
Standard		
6	**9,7** (6,7 - 12,7)	**10,3** (6,8 - 13,8)
7	**10,6** (8,5 - 12,6)	**11,0** (8,2 - 13,8)
8	**16,9** (11,4 - 22,4)	**12,6** (9,3 - 16,0)
9	**19,6** (13,2 - 25,9)	**16,3** (10,1 - 22,6)
10	**22,6** (19,1 - 26,2)	**20,8** (16,8 - 24,7)
Language(s)		
Afrikaans	**13,4** (11,0 - 15,8)	**12,4** (9,6 - 15,2)
Afrikaans and English	**15,0** (10,8 - 19,3)	**13,6** (10,0 - 17,2)
English	**18,4** (15.9 - 21,0)	**15,9** (14,8 - 17,0)
Xhosa	**15,6** (12,1 - 19,2)	**14,4** (11,1 - 17,7

* No. of missing responses = 189

Table 4.31 *Percentages (with 95% confidence intervals) of students who had driven a motor vehicle during the previous 12 months who drove under the influence of alcohol or cannabis, by standard and language(s) spoken at home, and gender (N=2 116)**

	Males	Females
Standard		
6	**8,7** (6,9 - 10,5)	**7,8** (2,7 - 13,0)
7	**7,7** (4,3 - 11,1)	**9,2** (2,5 - 15,9)
8	**8,7** (4,6 - 12,9)	**7,8** (3,8 - 11,9)
9	**6,4** (4,0 - 8,8)	**5,2** (1,8 - 8,5)
10	**10,2** (6,9 - 13,2)	**6,7** (2,8 - 10,5)
Language(s)		
Afrikaans	**9,1** (5,2 - 13,0)	**3,5** (1,7 - 5,4)
Afrikaans and English	**8,6** (5,7 - 11,4)	**9,0** (3,7 - 14,4)
English	**7,2** (5,1 - 9,3)	**9,8** (8,1 - 11,5)
Xhosa	**10,2** (5,5 - 14,9)	**8,4** (0,0 - 16,9

* No. of missing responses = 72

4.2.6 Violent behaviour

In the questionnaire, many of the questions in this section were grouped according to the *venues* at which various violent acts may have taken place; for example, the students were asked whether at school they had (*inter alia*) been physically injured by another pupil or physically injured another pupil. In reporting the results below, the items are grouped according to the *type of violent act.*

a) Victims of physical aggression

The percentages of students who in the previous 12 months had been the victims of various episodes of physical aggression are provided below:

- physically injured by another student at school - 12,7% (95% CI: 11,4 - 14,0);
- physically injured by a member of staff at school (excluding physical punishment) - 7,2% (95% CI: 6,0 - 8,4);
- physically hurt by an adult at home - 9,6% (95% CI: 8,4 - 10,8); and
- physically injured by anybody outside of home or school - 13,8% (95% CI: 12,5 - 15,1).

The results for the above episodes are presented by gender, and by standard and home language(s) in Tables 4.32 to 4.35.

*Table 4.32 Percentages (with 95% confidence intervals) of students who during the previous 12 months had been physically injured by another student, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**22,3** (18,6 - 25,9)	**9,1** (6,7 - 11,5)
7	**24,2** (21,9 - 26,5)	**10,0** (7,0 - 13,0)
8	**14,8** (12,7 - 16,9)	**6,7** (4,4 - 9,0)
9	**17,4** (13,6 - 21,2)	**6,7** (3,9 - 9,4)
10	**9,5** (7,1 - 11,9)	**4,7** (3,1 - 6,4)
Language(s)		
Afrikaans	**16,1** (14,8 - 17,4)	**8,4** (6,3 - 10,4)
Afrikaans and English	**21,7** (18,6 - 24,9)	**10,4** (7,7 - 13,1)
English	**23,2** (21,8 - 24,5)	**6,6** (4,9 - 8,4)
Xhosa	**5,7** (2,4 - 9,0)	**3,7** (2,3 - 5,1)

* No. of missing responses = 45

*Table 4.33 Percentages (with 95% confidence intervals) of students who during the previous 12 months had been physically injured by a school staff member, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**13,9** (10,3 - 17,5)	**4,4** (2,9 - 5,8)
7	**15,6** (13,7 - 17,5)	**4,9** (2,9 - 5,8)
8	**11,7** (8,9 - 14,4)	**3,3** (1,9 - 4,7)
9	**7,9** (5,2 - 10,7)	**3,0** (1,2 - 4,9)
10	**4,8** (1,7 - 8,0)	**1,0** (0,1 - 2,0)
Language(s)		
Afrikaans	**12,0** (9,6 - 14,4)	**4,1** (3,0 - 5,1)
Afrikaans and English	**12,9** (11,0 - 14,7)	**4,3** (1,7 - 6,9)
English	**11,0** (9,6 - 12,5)	**2,8** (0,6 - 5,1)
Xhosa	**5,6** (4,0 - 7,2)	**2,2** (1,3 - 3,1)

* No. of missing responses = 56

*Table 4.34 Percentages (with 95% confidence intervals) of students who during the previous 12 months had been physically injured by an adult at home, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**14,7** (11,8 - 17,7)	**11,3** (8,1 - 14,4)
7	**9,5** (7,5 - 11,5)	**10,0** (7,4 - 12,6)
8	**7,3** (5,5 - 9,2)	**10,6** (7,6 - 13,5)
9	**7,9** (6,0 - 9,8)	**8,8** (6,7 - 10,9)
10	**5,2** (3,1 - 7,3)	**7,6** (5,2 - 9,9)
Language(s)		
Afrikaans	**8,9** (7,1 - 10,8)	**10,2** (8,5 - 11,8)
Afrikaans and English	**10,7** (8,5 - 12,9)	**12,9** (10,2 - 15,7)
English	**8,8** (7,6 - 9,9)	**7,4** (4,4 - 10,4)
Xhosa	**9,7** (7,8 - 11,6)	**8,6** (7,5 - 9,7)

* No. of missing responses = 44

*Table 4.35 Percentages (with 95% confidence intervals) of students who during the previous 12 months had been physically injured by someone outside of school or home, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**22,5** (19,0 - 26,0)	**10,4** (7,7 - 13,0)
7	**22,1** (19,8 - 24,4)	**10,1** (7,6 - 12,6)
8	**17,4** (14,8 - 20,0)	**8,8** (6,3 - 11,3)
9	**19,5** (16,4 - 22,6)	**7,4** (5,3 - 9,5)
10	**13,8** (12,0 - 15,6)	**7,5** (5,7 - 9,2)
Language(s)		
Afrikaans	**18,8** (16,3 - 21,4)	**9,7** (7,6 - 11,7)
Afrikaans and English	**20,9** (17,8 - 23,9)	**9,0** (7,6 - 10,4)
English	**19,9** (17,0 - 22,8)	**8,6** (6,8 - 10,5)
Xhosa	**18,2** (15,5 - 20,8)	**6,8** (6,3 - 7,4)

* No. of missing responses = 43

Gender

For episodes of being injured by another student or a school staff member *at school* and of being injured by anybody *outside of home and school* there were more males involved for each school standard and language group. However, for episodes of being hurt by adults *at home*, this trend was not preserved in that there were no consistent trends according to gender for this venue.

Standard

In the school setting, there was a trend for the prevalence to reach a peak at standard 7 and then declined to standard 10; this applied to both genders and to both being physically injured by another student and by a member of staff.

There were no discernible trends for the items involving being a victim of acts of physical aggression in the home context or outside of school or home.

Language(s)

For boys in the *school* setting, a greater proportion of those speaking Xhosa reported being physically injured both by another student and by a member of staff than those speaking other languages. For girls in this setting, a smaller proportion of those speaking Xhosa reported being injured by another student, although the 95% confidence interval for those speaking Xhosa

overlapped with those speaking English. The 95% confidence interval for Xhosa-speaking girls for the item involving being injured by a member of staff at school overlapped with those for all the other language groups.

For the items involving being the victim of physical aggression in the home context and outside of home or school, there were no clear trends with respect to language group.

b) Perpetrators of physical aggression.

There were two items involving perpetrating acts of physical aggression, *viz.* physically inuring another student at school and physically injuring somebody outside of home or school. The percentages of students who in the previous 12 months had perpetrated these acts of physical aggression are provided below:

- another student at school - 11,0% (95% CI: 9,5 - 12,4); and
- someone outside of home or school - 11,7% (95% CI: 10,2 - 13,2).

More males than females were involved for each standard and language group (Tables 4.36 and 4.37).

There was a trend for the percentage of girls who had physically injured another student at school to decline with standard. For boys for this item, and for each gender for the item involving physically injuring anybody

*Table 4.36 Percentages (with 95% confidence intervals) of students who during the previous 12 months had physically injured another student at school, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**19,9** (16,1 - 23,6)	**5,5** (3,1 - 7,8)
7	**19,6** (16,8 - 22,5)	**4,9** (3,8 - 6,1)
8	**16,6** (12,1 - 21,1)	**3,3** (2,2 - 4,4)
9	**19,8** (15,7 - 23,9)	**2,7** (1,0 - 4,5)
10	**18,1** (12,7 - 23,5)	**2,4** (0,0 - 3,6)
Language(s)		
Afrikaans	**18,1** (16,8 - 19,4)	**4,3** (3,5 - 5,2)
Afrikaans and English	**22,1** (17,6 - 26,7)	**5,0** (3,8 - 6,3)
English	**22,8** (18,6 - 26,8)	**4,0** (2,0 - 5,9)
Xhosa	**4,3** (2,5 - 6,1)	**1,5** (1,3 - 1,8)

* No. of missing responses = 42

*Table 4.37 Percentages (with 95% confidence intervals) of students who during the previous 12 months had physically injured someone outside of home or school, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**18,9** (15,5 - 22,3)	**5,0** (3,8 - 6,2)
7	**22,0** (19,7 - 24,4)	**4,9** (3,5 - 6,3)
8	**19,6** (14,1 - 25,2)	**3,7** (2,6 - 4,8)
9	**23,1** (18,7 - 27,6)	**3,5** (1,3 - 5,7)
10	**18,2** (12,9 - 23,5)	**4,0** (2,3 - 5,7)
Language(s)		
Afrikaans	**19,0** (17,3 - 20,6)	**4,2** (3,0 - 5,4)
Afrikaans and English	**23,1** (18,8 - 27,4)	**6,4** (5,0 - 7,7)
English	**24,6** (19,0 - 30,2)	**4,0** (2,9 - 5,1)
Xhosa	**8,3** (6,7 - 9,8)	**1,9** (1,5 - 2,4)

* No. of missing responses = 52

outside of home or school, there were no trends with respect to standard for this item.

The proportion of Xhosa-speakers who had physically injured another pupil at school or someone outside of home or school was lower than for any other language group.

c) Vandalism

Items involving vandalism were asked for both the school context and outside of home and school. In the past 12 months, the percentages of students who had caused serious damage to property were as follows: *(i)* at school - 5,0% (95% CI: 4,1 - 5,9); and *(ii)* outside of home or school - 5,4% (95% CI: 4,0 - 6,7).

Except for those speaking Xhosa for the item involving damage to property outside of home or school, there were more males than females involved in each standard and language group (Tables 4.38 and 4.39).

There was a detectable trend according to standard only for females for the item involving vandalism at school. In this case, there was a trend for the prevalence to decline from standard 6 to standard 10; however, the trend was not marked and the number of students involved was small, and so this trend should be interpreted with caution.

A smaller percentage of Xhosa-speaking students had been involved in acts of vandalism in both the school context and outside of home or school. The only item for which the 95% confidence intervals overlapped was for that involving damage to property outside of home or school.

*Table 4.38 Percentages (with 95% confidence intervals) of students who during the previous 12 months had caused serious damage to property at school, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**8,4** (5,5 - 11,3)	**2,7** (1,2 - 4,1)
7	**8,3** (4,8 - 11,3)	**2,2** (1,3 - 3,0)
8	**10,3** (8,5 - 12,2)	**2,3** (1,2 - 3,5)
9	**6,1** (3,9 - 8,2)	**1,2** (0,4 - 2,1)
10	**8,5** (5,2 - 11,9)	**1,2** (0,6 - 1,9)
Language(s)		
Afrikaans	**6,2** (5,1 - 7,4)	**1,8** (1,3 - 2,2)
Afrikaans and English	**10,7** (8,1 - 13,2)	**2,7** (1,6 - 3,8)
English	**11,5** (7,5 - 15,5)	**2,5** (1,7 - 3,2)
Xhosa	**3,3** (2,7 - 4,0)	**0,4** (0,3 - 0,6)

* No. of missing responses = 44

*Table 4.39 Percentages (with 95% confidence intervals) of students who during the previous 12 months had caused damage to property outside of school or home, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**9,4** (6,7 - 12,1)	**2,4** (1,4 - 3,5)
7	**9,5** (5,7 - 13,4)	**2,9** (1,7 - 4,0)
8	**10,4** (8,1 - 12,8)	**1,8** (0,7 - 2,9)
9	**9,5** (6,0 - 13,0)	**1,3** (0,5 - 2,2)
10	**6,6** (3,9 - 9,4)	**1,1** (0,4 - 1,8)
Language(s)		
Afrikaans	**6,4** (4,6 - 8,1)	**1,8** (1,1 - 2,6)
Afrikaans and English	**11,6** (9,2 - 14,1)	**1,9** (0,9 - 2,9)
English	**14,4** (11,7 - 17,2)	**2,7** (1,7 - 3,7)
Xhosa	**0,8** (0,4 - 1,1`	**0,8** (0,4 - 1,1)

* No. of missing responses = 47

d) Weapon carrying

The percentage of students who reported carrying a knife to be used as weapon during the previous four weeks at school was 5,2 (95% CI: 4,5% - 5,8%). For each standard and home language, the percentage of males engaging in this behaviour was higher than that of females (Table 4.40).

There were no clear trends with respect to standard. For both males and females, there was a trend for the Xhosa-speaking students to be more likely to carry a knife to be used as a weapon at school than those speaking other languages, although there were relevant confidence intervals that did overlap.

Of those who had carried a knife to be used as a weapon at school during the previous four weeks, 34,2% (95% CI: 27,1 - 41,2) indicated that they always carried a knife.

Only 3,8% (95% CI: 3,1 - 4,5) of the students reported carrying a weapon other than a knife. Guns comprised the second most frequently carried weapon.

e) Exposure to physical danger

The questions involving physical danger all referred to getting home at night from beyond the neighbourhood during the previous four weeks. The percentages of students who had exposed themselves to risk in this way were as follows: (I) not knowing how to get home - 17,3% (95% CI: 14,0 - 20,5); *(ii)* walking home alone - 25,0% (95% CI: 23,3 - 26,7); and *(iii)* hitch-hiking home - 7,1% (95% CI: 5,5 - 8,6).

*Table 4.40 Percentages (with 95% confidence intervals) of students who during the previous 4 weeks at school had carried a knife as a weapon, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**8,2** (6,5 - 9,9)	**1,0** (0,4 - 1,7)
7	**9,6** (7,5 - 11,7)	**1,8** (0,6 - 3,0)
8	**11,4** (8,8 - 14,1)	**1,7** (0,9 - 2,6)
9	**11,1** (7,8 - 14,4)	**1,1** (0,5 - 1,7)
10	**7,1** (5,1 - 9,1)	**0,9** (0,2 - 1,6)
Language(s)		
Afrikaans	**8,1** (7,0 - 9,0)	**0,9** (0,3 - 1,6)
Afrikaans and English	**12,0** (9,9 - 14,0)	**1,4** (0,3 - 2,6)
English	**9,0** (6,3 - 11,7)	**1,2** (0,4 - 2,0)
Xhosa	**15,0** (11,6 - 18,4)	**2,6** (2,3 - 3,0)

* No. of missing responses = 42.

A greater percentage of males than females exposed themselves to danger in getting home at night from beyond their neighbourhood (Tables 4.41 to 4.43). This was the case for all the behaviours, for both genders, for all standards, and for all home languages.

There were no trends according to standard for walking home alone at night . However, for the other two risk behaviours, for both males and females, there was a trend for the prevalence to increase with standard.

A larger proportion of Xhosa-speaking girls reported walking home alone at night from beyond the neighbourhood than girls speaking other languages. There were no other consistent trends according to language group.

4.2.7 Sexual behaviour

Of those completing the full version of the questionnaire, 17,4% (95% CI: 14,4 - 20,3) reported that they had ever had heterosexual vaginal intercourse. With the exception of Std 10, there was a trend for a greater proportion of males than females reported having had intercourse for each standard and language group (Table 4.44).

The proportion of boys who had experienced sexual intercourse increased from standard 6 to standard 9 before declining. The proportion of girls who had experienced sexual intercourse increased from standard 6 to standard 10.

For both boys and girls, the proportion of Xhosa-speaking students who had participated in sexual intercourse was substantially larger than that of those speaking other languages.

*Table 4.41 Percentages (with 95% confidence intervals) of students who during the previous 4 weeks at school went out beyond their neighbourhood without knowing how they would get home, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**12,5** (9,4 - 15,7)	**10,1** (8,4 - 11,7)
7	**17,2** (11,8 - 22,5)	**10,4** (8,1 - 12,6)
8	**23,1** (17,3 - 28,9)	**13,2** (9,6 - 16,7)
9	**28,5** (21,3 - 35,6)	**17,7** (13,0 - 22,5)
10	**30,8** (23,1 - 38,4)	**19,1** (16,2 - 22,0)
Language(s)		
Afrikaans	**14,8** (12,6 - 17,0)	**11,6** (8,9 - 14,3)
Afrikaans and English	**24,0** (21,0 - 27,0)	**15,2** (12,6 - 17,8)
English	**33,5** (31,0 - 35,9)	**18,9** (17,2 - 20,6)
Xhosa	**11,5** (10,1 - 12,9)	**7,2** (5,3 - 9,1)

* No. of missing responses = 46

*Table 4.42 Percentages (with 95% confidence intervals) of students who during the previous 4 weeks went out at night beyond their neighbourhood and walked home alone, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**27,5** (23,4 - 31,7)	**11,8** (9,0 - 14,7)
7	**36,8** (33,1 - 40,6)	**16,3** (12,7 - 19,9)
8	**41,4** (37,7 - 45,2)	**12,7** (10,5 - 14,8)
9	**45,7** (42,7 - 49,0)	**14,9** (12,1 - 17,7)
10	**40,2** (35,7 - 44,9)	**15,7** (12,4 - 19,0)
Language(s)		
Afrikaans	**37,6** (34,6 - 40,5)	**15,0** (12,4 - 17,6)
Afrikaans and English	**37,7** (33,5 - 42,0)	**11,6** (8,2 - 15,0)
English	**35,9** (33,4 - 38,5)	**10,3** (8,7 - 11,8)
Xhosa	**42,0** (35,8 - 48,2)	**22,5** (20,2 - 24,8)

* No. of missing responses = 47

*Table 4.43 Percentages (with 95% confidence intervals) of students who during the previous 4 weeks went out at night beyond their neighbourhood and hitch-hiked home, by standard and language(s) spoken at home, and gender (N=7 340)**

	Males	Females
Standard		
6	**5,2** (3,3 - 7,1)	**2,1** (0,4 - 3,7)
7	**9,8** (6,0 - 13,7)	**2,4** (1,5 - 3,2)
8	**11,3** (6,7 - 15,8)	**3,3** (1,8 - 4,8)
9	**14,8** (11,5 - 18,2)	**5,3** (3,0 - 7,6)
10	**15,0** (10,8 - 19,2)	**5,3** (2,7 - 8,0)
Language(s)		
Afrikaans	**9,4** (6,8 - 12,1)	**3,3** (1,3 - 5,4)
Afrikaans and English	**10,6** (7,1 - 14,2)	**3,3** (2,0 - 4,6)
English	**14,3** (9,5 - 19,1)	**4,0** (2,7 - 5,3)
Xhosa	**7,8** (6,9 - 8,6)	**3,0** (1,6 - 4,3)

* No. of missing responses = 55

Table 4.44 Percentages (with 95% confidence intervals) of students who have experienced heterosexual intercourse, by standard and language(s) spoken at home, and gender (N=5 851)

	Males	Females
Standard		
6	**14,1** (11,5 - 16,6)	**6,8** (4,5 - 9,0)
7	**19,8** (16,4 - 23,3)	**10,2** (9,1 - 11,3)
8	**25,1** (19,4 - 30,9)	**15,8** (14,2 - 17,5)
9	**27,0** (21,5 - 32,5)	**18,6** (12,8 - 24,4)
10	**21,6** (13,5 - 29,7)	**25,0** (16,4 - 32,5)
Language(s)		
Afrikaans	**14,1** (13,0 - 15,3	**3,9** (3,0 - 4,8)
Afrikaans and English	**18,9** (16,9 - 21,0)	**6,9** (5,2 - 8,7)
English	**18,0** (10,7 - 25,4)	**12,7** (10,5 - 14,9)
Xhosa	**68,3** (60,6 - 76,0)	**60,8** (54,6 - 67,0)

For those who had experienced sexual intercourse, their median age at which this first occurred was 14,9 years (interquartile range: 12,8 - 15,9) for males and 15,6 years (interquartile range: 14,6 - 16,6) for females. There was little variation in the median age at first intercourse between the language groups; for males, the median ages ranged between 14,3 and 15,0 years while for females they ranged between 15,3 and 16,0 years.

Of those students who indicated that they had experienced intercourse, 76,6% (95% CI: 71,0 - 82,2) had known their partners for longer than 7 days prior to their last coital episode. With the exception of those speaking both English and Afrikaans at home, fewer males than females had known their partner for longer than 7 days (Table 4.45). Students in Standards 9 and 10 appeared to be more likely to have known their partner for more than seven days than those in Standard 6.

There were no consistent trends according to school standard for the percentage of those knowing their partner for more than seven days. Although some of the relevant confidence intervals did overlap, there was a trend for the proportion of Xhosa-speaking students who had known their partner for more than seven days on the last coital episode to be less than that of those speaking other languages.

The median number of partners in the previous 12 months was 1,5 (interquartile range: 1,0 - 3,5) for males and 1,0 (interquartile range: 1,0 - 1,3) for females. There were no obvious trends with respect to standard. There was little variation between the language groups; for males, the medians ranged between 1,3 and 2,0 while for females the median was 1,0 for all the language groups.

*Table 4.45 Percentages (with 95% confidence intervals) of students who had experienced heterosexual intercourse who had known their partner for more than seven days on their most recent coital episode, by standard and language(s) spoken at home, and gender (N=1 781)**

	Males	Females
Standard		
6	**54,0** (37,0 - 71,0)	**59,9** (46,8 - 73,0)
7	**71,8** (65,1 - 78,5)	**79,0** (73,8 - 84,3)
8	**68,0** (58,9 - 77,2)	**86,9** (80,9 - 92,9)
9	**78,7** (73,1 - 84,4)	**82,9** (77,2 - 88,5)
10	**86,4** (80,7 - 92,0)	**89,9** (84,3 - 95,5)
Language(s)		
Afrikaans	**14,1** (13,0 - 15,3	**3,9** (3,0 - 4,8)
Afrikaans and English	**18,9** (16,9 - 21,0)	**6,9** (5,2 - 8,7)
English	**18,0** (10,7 - 25,4)	**12,7** (10,5 - 14,9)
Xhosa	**68,3** (60,6 - 76,0)	**60,8** (54,6 - 67,0)

* 84,2% of those who indicated that they had experienced sexual intercourse answered this question.

The median number of weeks since the last coital episode was 6,1 (interquartile range: 1,8 - 26,5) for males and 6,8 (interquartile range: 2,0 - 24,3) for females.

Of those who reported having experienced sexual intercourse, 60,5% (95% CI: 55,7 - 65,3) did something to prevent pregnancy on their last coital episode. Except for those in standard 6, females were more likely than males to have taken steps against unwanted pregnancy for each standard and language group (Table 4.46). Relatively low proportions of Afrikaans- and Xhosa-speaking males reported using contraceptive measures on their last coital episode.

There were no discernible trends regarding the methods of contraception used according to school standard. This was not the case in relation to language group (Table 4.47). Except for Xhosa-speaking students, the most frequently used method of contraception was condoms, with injectable steroids being used relatively infrequently. For Xhosa-speaking students, the converse was the case in that injectable steroids were the most frequently used method of contraception whereas condoms were used relatively infrequently.

Of all the students, 1,3% (95% CI: 1,0 - 1,6) indicated that they had had heterosexual anal intercourse. Of all the male students, 1,4% (95% CI: 1,1 - 1,7) indicated that they had had homosexual anal intercourse. It is not possible to provide further data regarding these students owing to the small number of students involved.

*Table 4.46 Percentages (with 95% confidence intervals) of students who had experienced heterosexual intercourse who had done something to prevent pregnancy on their most recent coital episode, by standard and language(s) spoken at home, and gender (N=1 781)**

	Males	Females
Standard		
6	**49,1** (34,4 - 63,8)	**48,1** (37,3 - 58,9)
7	**49,6** (42,9 - 56,2)	**67,8** (61,1 - 74,5)
8	**63,3** (52,4 - 74,2)	**70,0** (64,3 - 75,7)
9	**54,1** (47,6 - 60,7)	**67,4** (61,1 - 73,6)
10	**62,2** (54,1 - 70,3)	**74,5** (70,4 - 78,6)
Language(s)		
Afrikaans	**22,5** (16,6 - 28,5	**65,3** (60,5 - 70,1)
Afrikaans and English	**57,1** (50,3 - 63,9)	**65,6** (55,8 - 74,5)
English	**63,7** (56,3 - 71,1)	**68,5** (62,7 - 74,2)
Xhosa	**23,6** (14,0 - 33,3)	**73,3** (69,1 - 77,5)

* 78,1% of the students who indicated that they had experienced sexual intercourse answered this question.

Table 4.47 Percentage (with 95% confidence intervals) of students in each language group who had used or done anything to prevent pregnancy on their most recent coital episode, who used various methods of contraception (N = 1 781)

	Afrikaans	Afrikaans and English	English	Xhosa
Condoms	**81,9** (77,1 - 86,8)	**70,7** (49,7 - 91,7)	**68,6** (65,7 - 71,5)	**16,0** (14,9 - 17,2)
Oral steroids	**6,7** (3,9 - 9,6)	**18,2** (7,2 - 29,3)	**32,6** (30,2 - 35,0)	**13,6** (11,8 - 15,5)
Injectable steroids	**4,2** (3,4 - 5,0)	**2,2** (0,3 - 4,1)	**7,8** (4,2 - 11,4)	**75,5** (73,4 - 77,6)
Withdrawal	**7,1** (3,5 - 10,8)	**14,9** (0,0 - 31,3)	**9,3** (7,0 - 11,6)	**2,2** (1,5 - 2,9)
Rhythm	**4,6** (0,0 - 10,0)	**13,8** (0,0 - 29,6)	**6,4** (2,7 - 10,0)	**9,2** (7,3 - 11,0)

* Only methods used by more than 5% of all the students who had used or done something to prevent pregnancy on their last coital episode are presented. Some students used more than 1 method.

4.3 BIVARIATE RELATIONSHIPS BETWEEN BEHAVIOURS

Objective 2 of the study is as follows.

> *To investigate whether the notion of a syndrome of adolescent risk behaviour is valid for high-school students in the Cape Peninsula and to investigate whether suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome.*

In this section, the results that address this objective will be presented. As mentioned in the Methods chapter of this thesis, unadjusted odds ratios were calculated for all possible pairs of eight risk behaviours. The motivation for the inclusion of these specific risk behaviours is provided in the Literature Review and the Methods chapters. The analysis was stratified according to gender. Knife carrying was not included for girls owing to their low prevalence for this behaviour.

The unadjusted odds ratios for the relationships between the risk behaviours are presented in Tables 4.48 and 4.49 for boys and girls respectively.

All the unadjusted odds ratios for the relationships between the pairs of risk behaviours are greater than 1. This indicates that there is a *trend* for all the risk behaviours to be related to each other.

*Table 4.48 Unadjusted odds ratios (with 95% confidence intervals) for the relationships between selected risk behaviours for boys**

	Cannabis	Intercourse	Knife carrying	Cigarettes	Suicide	Seat belt	Walk home
Alcohol	**6,0** 4,8-7,6	**3,4** 2,8-4,1	**2,3** 1,8-3,0	**4,7** 3,9-5,6	**2,0** 1,4-2,8	**1,6** 1,3-1,9	**2,2** 1,9-2,7
Cannabis		**3,6** 2,8-4,6	**3,9** 3,0-5,0	**7,2** 5,7-9,1	**2,7** 1,9-3,8	**2,0** 1,5-2,5	**2,2** 1,8-2,8
Intercourse			**3,5** 2,7-4,5	**3,0** 2,5-3,6	**2,4** 1,7-3,3	**1,6** 1,3-1,9	**2,5** 2,1-2,9
Knife carrying				**3,3** 2,6-4,1	**2,8** 2,0-4,1	**1,9** 1,5-2,5	**2,7** 2,1-3,3
Cigarettes					**2,4** 1,7-3,2	**1,5** 1,3-1,9	**2,2** 1,9-2,6
Suicide						**1,2** 0,9-1,7	**2,0** 1,5-2,7
Seat belt							**1,5** 1,3-1,7

* **Definitions of behaviours:** *alcohol* - having 5 or more drinks on at least one occasion in the previous 14 days; *cannabis* - ever having smoked cannabis; *intercourse* - ever having had heterosexual vaginal intercourse; *knife carrying* - having carried a knife to school to be used as a weapon in the previous 4 weeks; *cigarettes* - currently smoking at least one cigarette per day; *suicide* - attempting suicide in the previous 12 months; *seat belt* - not using a seat belt on the last occasion when travelling in the front passenger seat of a motor vehicle; and *walk home* - going out at night beyond the neighbourhood and walking home alone during the previous 4 weeks.

*Table 4.49 Unadjusted odds ratios (with 95% confidence intervals) for the relationships between selected risk behaviours for girls**

	Cannabis	Intercourse	Cigarettes	Suicide	Seat belt	Walk home
Alcohol	**10,9** 7,7-15,4	**1,8** 1,4-2,4	**6,1** 4,8-7,6	**2,8** 2,1-3,6	**1,5** 1,2-1,9	**2,4** 1,9-3,1
Cannabis		**3,6** 2,5-5,3	**16,4** 11,4-23,4	**3,1** 2,1-4,6	**2,3** 1,6-3,3	**2,3** 1,6-3,3
Intercourse			**1,1** 0,9-1,4	**1,4** 1,1-1,8	**1,2** 1,0-1,5	**2,2** 1,8-2,7
Cigarettes				**3,5** 2,8-4,4	**1,6** 1,3-2,0	**1,9** 1,5-2,4
Suicide					**1,3** 1,0-1,6	**2,6** 2,1-3,3
Seat belt						**1,2** 1,0-1,5

* See previous table for definitions of risk behaviours. Knife carrying was not included for girls owing to their low prevalence for this risk behaviour.

In addition, the odds ratios were significantly greater than 1 for all but five of the 49 relationships examined. Details of these significant relationships are provided below.

- The odds ratios were significantly greater than 1 for the relationships between all the pairs of risk behaviours corresponding to those described by Jessor and Jessor (1977) (alcohol misuse, cannabis smoking, sexual intercourse, and knife carrying).

- The odds ratios were significantly greater than 1 for the relationships between cigarette smoking and all the behaviours included in the "original" syndrome of risk behaviour except for that between cigarette smoking and having had sexual intercourse for girls.

- The odds ratios were significantly greater than 1 for the relationships between all the above risk behaviours and suicidal behaviour as well as behaviours exposing oneself to risk of physical injury *except* for failure to use a seat belt and the following behaviours: *(i)* attempting suicide in the previous 12 months for boys and girls; *(ii)* ever having had sexual intercourse for girls; and *(iii)* going out at night and walking home alone during the previous four weeks for girls.

For all the relationships mentioned above involving seat belt use by girls in which the odds ratios were not significantly greater than 1, the lower limit of the 95% confidence interval was 1,0. This indicates that one can regard these relationships as being of borderline significance.

4.4 MULTIVARIATE RELATIONSHIPS AMONG BEHAVIOURS

Objective 3 of the study is as follows.

> *To investigate the relationships between various risk behaviours, taking into account their influence upon one another.*

In this section, the results that are relevant to this objective will be presented. As mentioned in the Methods chapter, stepwise logistic regression analyses were carried out to find the best fitting model to describe the relationship between each of eight risk behaviours serving as dependent variables and 26 other risk behaviours serving as independent variables. The variables serving as dependent variables for the other stepwise logistic regression models were included among these independent variables. Separate analyses were carried out for each gender. A probability of 0,01 was used as entry criterion.

The odds ratios (with 95% confidence intervals) for each dependent variable and gender for those variables qualifying for inclusion in the stepwise logistic regression model are presented in Tables 4.50 to 4.57.

*Table 4.50 Odds ratios (with 95% confidence intervals) for the dependent variable of **smoking at least one cigarette per day** for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
2.	Cannabis smoking	3,7 (2,6-5,2)	8,4 (5,0-14,0)
6.	Alcohol bingeing	2,4 (1,8-3,1)	3,3 (2,4-4,6)
7.	Having had heterosexual vaginal intercourse	2,1 (1,6-2,7)	-
14.	Having physically injured anyone outside of home or school	1,7 (1,3-2,3)	2,4 (1,5-3,9)
16.	Carrying a knife to school to be used as a weapon	2,3 (1,6-3,2)	-
17.	Going out without knowing how to get home	1,7 (1,2-2,3)	-
20.	Seriously thinking about self harm in a way which might result in death	2,2 (1,7-2,8)	-

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

*Table 4.51 Odds ratios (with 95% confidence intervals) for the dependent variable of **ever having smoked cannabis on its own** for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
1.	Cigarette smoking	4,7 (3,3-6,8)	9,3 (5,6-15,5)
3.	Smoking cannabis and methaqualone together	22,0 (10,3-47,0)	-
4.	Sniffing glue, petrol, or thinners	2,8 (1,9-4,2)	5,3 (3,1-9,1)
6.	Alcohol bingeing	3,2 (2,2-4,6)	-
7.	Having had heterosexual intercourse	1,9 (1,3-2,7)	2,2 (1,7-2,8)
15.	Causing serious damage to property outside of home or school	-	4,3 (1,6-11,2)
18.	Going out at night and walking home alone	-	2,1 (1,2-3,6)
19.	Going out at night and hitchhiking home	2,4 (1,5-3,7)	-

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

Table 4.52 *Odds ratios (with 95% confidence intervals) for the dependent variable of* ***having five or more drinks on at least one occasion in the previous 14 days*** *for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
1.	Cigarette smoking	2,4 (1,8-3,1)	3,2 (2,3-4,5)
2.	Cannabis smoking	2,9 (2,1-4,1)	2,6 (1,6-4,3)
4.	Sniffing glue, petrol or thinners	2,4 (1,7-3,4)	-
7.	Having had heterosexual intercourse	2,3 (1,8-3,0)	-
8.	Being physically injured by another pupil at school	0,6 (0,4-0,8)	-
15.	Causing serious damage to property outside of home or school	-	3,1 (1,5-6,5)
17.	Going out at night without knowing how to get home	2,3 (1,7-3,1)	3,1 (2,2-4,3)
23.	Riding on a motorbike or motor scooter	-	1,7 (1,2-2,4)

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

Table 4.53 Odds ratios (with 95% confidence intervals) for the dependent variable of ***ever having had heterosexual intercourse*** *for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
1.	Cigarette smoking	2,2 (1,7-2,8)	-
2.	Cannabis smoking	-	4,5 (2,8-7,0)
3.	Smoking cannabis and methaqualone together	3,9 (2,0-7,6)	-
6.	Alcohol bingeing	2,3 (1,8-3,0)	1,8 (1,3-2,5)
16.	Carrying a knife to school	1,9 (1,3-2,7)	-
18.	Going out at night and walking home alone	2,2 (1,8-2,8)	2,1 (1,5-2,7)
22.	Tried to end one's life	2.0 (1,3-3,3)	-
24.	Being involved in an accident while travelling in a motor vehicle	1,8 (1,3-2,6)	-

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

Table 4.54 Odds ratios (with 95% confidence intervals) for the dependent variable of ***ever having carried a knife to school to be used as a weapon during the previous four weeks*** *for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
1.	Cigarette smoking	2,5 (1,7-3,5)	
7.	Having had heterosexual vaginal intercourse	2,8 (1,9-4,0)	
10.	Physically injuring another pupil at school	2,0 (1,3-3,0)	
15.	Causing serious damage to property outside of home or school	3,3 (2,1-5,1)	

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

*Table 4.55 Odds ratios (with 95% confidence intervals) for the dependent variable of **going out at night beyond the neighbourhood and walking home alone during the previous four weeks** for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
7.	Having had heterosexual vaginal intercourse	2,2 (1,8-2,8)	2,1 (1,5-2,8)
12.	Being physically injured by an adult at home	-	1,7 (1,2-2,4)
13.	Being physically injured by anyone outside of home or school	1,5 (1,1-2,0)	-
14.	Having physically injured anyone outside of home or school	1,5 (1,2-2,0)	-
15.	Causing serious damage to property outside of home or school	3,8 (2,0-7,3)	-
17.	Going out at night without knowing how to get home	2,4 (1,9-3,1)	2,9 (2,1-3,9)
19.	Going out at night and hitchhiking home	2,4 (1,6-3,5)	2,6 (1,4-4,6)
22.	Tried to end one's life	-	1,9 (1,4-2,7)
25.	Being injured by a motor vehicle, motorbike or bicycle while walking or standing	-	2,0 (1,3-3,1)

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

Table 4.56 Odds ratios (with 95% confidence intervals) for the dependent variable of ***ever having tried to end one's life in the previous 12 months*** *for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
12.	Being physically injured by an adult at home	2,4 (1,3-4,5)	-
14.	Having physically injured anyone outside of home or school	2,5 (1,4-4,3)	-
18.	Going out at night and walking home alone	-	2,4 (1,7-3,5)
20.	Seriously thinking about self harm in a way which might result in death	10,7 (5,8-19,8)	16,0 (10,8-23,7)
21.	Telling anyone of an intention to end one's life	4,3 (2,4-7,8)	2,7 (1,9-3,8)

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

Table 4.57 Odds ratios (with 95% confidence intervals) for the dependent variable of ***not using a seat belt on the last occasion travelling in the front passenger seat of a motor vehicle*** *for those variables qualifying for inclusion in the stepwise logistic regression model for each gender*

No.*	Risk behaviour	Gender	
		Boys	*Girls*
4.	Sniffing glue, petrol, or thinners	-	1,9 (1,3-2,6)
6.	Having 5 or more drinks on at least one occasion	1,5 (1,2-2,0)	-
9.	Being injured by a school staff member	2,2 (1,6-2,9)	-
17.	Going out at night without knowing how to get home	-	1,7 (1,3-2,3)
18.	Going out at night and walking home alone	1,5 (1,2-1,9)	-
20.	Seriously thinking about self harm in a way which might result in death	-	1,6 (1,2-2,0)

* Refers to the number of the variable in Table 3.5 in the Methods chapter. See this table for the definitions of the independent variables.

Tables 4.50 to 4.57 reveal that for each dependent variable, between three and nine variables qualified for inclusion in the model for each gender. The extent to which the relationships between pairs of variables documented in the bivariable analysis (reported in Section 3 of this chapter) are preserved in the multivariate analysis varies according to the variables and gender. Thus, for the dependent variable of having had heterosexual intercourse for boys, all except one of the bivariable relationships are preserved once the influence of the other variables is taken into account. Conversely, for the dependent variable of having tried to end ones life in the previous 12 months for boys, *none* of the bivariable relationships are preserved.

Some specific findings from the multivariate analysis are as follows. Comments about the Implications of these specific findings will be made in the Discussion chapter below.

Specific finding #1

There is a substantial association between many forms of substance abuse; for example, male and female students who smoke cigarettes are more likely to have ever smoked cannabis and to have had an alcohol binge in the previous fortnight than those who do not smoke cigarettes.

Specific finding #2

The model for the dependent variable of attempting suicide in the previous 12 months did **not** include the variables involving cigarette

smoking, illicit substance use, alcohol bingeing, and (with the exception of physically injuring somebody outside of home or school in the previous 12 months) violent behaviour.

Specific finding #3

Seriously thinking about self harm in a way which might result in death or telling anyone of an intention to take one's life in the previous 12 months were significant predictors of a suicide attempt in the same time period.

Specific finding #4

Several variables involving accidental and non-accidental injury are significant predictors of exposure to danger in getting home at night, and this in turn is a significant predictor of substance abuse (such as cannabis smoking and alcohol bingeing).

Specific finding #5

Cannabis smoking, alcohol bingeing, and variables regarding exposure to danger in getting home at night are associated with having had sexual intercourse.

Chapter 5

Chapter 5

DISCUSSION

The structure of the initial three parts of this chapter will correspond to that of the previous chapter in which the results of the study were presented. Specifically, the following aspects will be discussed:

- the methodological limitations of the study;
- the prevalence of the behaviours in each domain of risk behaviour; and
- the interrelationships between behaviours.

Thereafter, some suggestions for future research and implementation aspects will receive attention before concluding.

5.1 METHODOLOGICAL LIMITATIONS

Methodological considerations that pertain to specific domains of risk behaviour will be discussed in Section 5.2 below in which the results for each domain of risk behaviour will be discussed. The remarks in this section will be confined to issues that are relevant for the project as a whole.

5.1.1 Validity and reliability

Validity refers to whether the adolescents provided accurate and honest answers to the questions. This is particularly pertinent for this study as much of the information sought is considered to be socially deviant or illegal (Whitehead and Smart, 1972). Threats to validity stem from two sources:

- *over*-reporting, arising out of a desire to be perceived to be engaging in risk behaviour, for example by peers; and

- *under*-reporting, arising out of the fear of being exposed and the subsequent embarrassment and possible legal repercussions.

With regard to over-reporting, an item concerning the use of a fictitious drug (Lovar-25) was inserted in the questionnaire. By excluding the 32 students who answered affirmatively to this question, the effect of this bias may have been reduced. However, those who over-reported with respect to other forms of risk taking behaviour may not have been detected by this method.

With regard to under-reporting, there were no items in the questionnaire to address this aspect. Techniques that have been employed in previous surveys include the use of biological markers (Yach, 1990) and the 'bogus pipeline', whereby the respondents are informed that the researchers will also obtain an independent and valid measure of their behaviour (Murray and Perry, 1987). However, as described in the Methods chapter of this thesis, every effort was made to guarantee confidentiality and anonymity.

Reliability refers to the reproducibility of the results on different occasions. It was not possible to document the reliability of the present instrument owing to its anonymity. Furthermore, if a separate reliability study had been undertaken for the instrument itself, it would not have been possible to maintain anonymity. It would thus not have been possible to extrapolate the findings to the present study.

In addition, previous studies involving comparisons of different methodologies and focus groups provide some reassurance that self reports of adolescents are, in most cases, valid and reliable (Brener *et al.*, 1995; Farrington, 1973; Goodstadt *et al.*, 1985; Needle *et al.*, 1983; O'Malley *et al.*, 1983; Rob *et al.*, 1990; Rootman and Smart, 1985; Torabi *et al.*, 1993).

5.1.2 Sampling

A limitation of school-based studies is the exclusion of important subgroups of adolescents. These include absentees and dropouts. As has been mentioned, prevalence rates for a variety of risk behaviours have been shown to be higher for these groups (Chavez *et al.*, 1989; Eggert *et al.*, 1990; Flisher and Chalton, 1995; Kandel, 1980; McKirnan and Johnson, 1986; Pirie *et al.*, 1988; Radosevich *et al.*, 1979; Van Wyk, 1985). The behavioural profiles derived in this study may thus reflect a *healthy student* effect.

Part of the rationale for the current study was to provide data that could bear on the introduction of more extensive health promotion programmes in South African schools. It could be argued that the bias inherent in the healthy student effect is not relevant for this rationale since students who

programmes. However, their risk behaviour and not being at school may be related to each other in that the former may have led to the latter; for example, alcohol intoxication may result in absenteeism, and pregnancy may necessitate dropping out. It is necessary to have data about the risk behaviour of absentees and dropouts to inform interventions that pertain not only to their risk behaviour but also to their scholastic progress (National Commission on the Role of the School and Community in Improving Adolescent Health, 1990).

It has also been argued that students who are absent or have dropped out constitute a small proportion of the adolescent population, and that their exclusion should not significantly influence the overall findings (Kandel, 1980). Data regarding absenteeism in South African schools are not readily obtainable. However, data regarding premature school-leaving indicate that that this represents a major challenge in South Africa. The figures for blacks are the most extreme; 33,6% begin high school but drop out before completing Standard 10, and 72,1% begin primary school and drop out before completing Standard 10 (Cape Times, 1990, and Central Statistical Services, 1991, both cited in Flisher and Chalton, 1995).

5.1.3 Response rates

The response rates for the full version of the questionnaire, in which the questions involving sexuality are included, are discussed below in Section 5.2.7 dealing with sexual behaviour. The comments below refer to the students completing *either version* of the questionnaire (Table 4.2).

There were only three schools for which the response rates (where available) were not good to excellent. In one of these schools (HoR 2), it

is possible that some classes were unintentionally omitted. If this is the reason for the low response rate for this school, and if the omitted classes were a "random" selection of all the classes in the school in the sense that they did not differ systematically from those that were included, the low response rate for this school is unlikely to have exerted a substantial influence on the results. The low response rates for the other two schools (HoA 5 and HoA 6) are more likely to have influenced the results. At these schools, the questionnaire was distributed after the examinations had been completed when there was a high sbsenteeism rate. It is possible that the students who were absent differed systematically from those still attending school. They may be less conforming to social expectations, and hence more likely to engage in risk behaviour. Related to this is the possibility that they were absent as a consequence of engaging in risk behaviour; for example, they may have been recovering from an alcohol binge when they should have been at school. This would have resulted in the "true" prevalence of risk behaviours among students attending these schools being higher than that reported in the previous chapter.

The absence of data about the response rates for the schools in the DET prevents speculation about the extent and nature of any bias in this department.

There is an additional level of non-response in the case of the HoA in that some schools declined to participate. It is possible that these schools differed systematically from the school that were included; for example, they may have been less tolerant of risk behaviour on the part of the students, or (conversely) they may have been aware of high levels of risk behaviour, either in general or for one or more specific risk behaviours.

There is no way of assessing the impact of the non-participation of schools on the results of the study.

Missing responses to individual items in the questionnaire were regarded as "no" responses. As mentioned in Section 3.5.1, this resulted in conservative prevalence estimates since they would almost certainly have been higher if there were no missing values. This should be borne in mind when interpreting the results, except for the items involving seat belt use for which a "no" response indicated increased risk.

5.1.4 Restriction on inter-departmental comparisons

It was mentioned in Chapter 3 that the Department of Education and Culture of the House of Representatives granted permission to proceed with the study only after the investigators had agreed that the results would not be presented or analysed according to education department. This is equivalent to prohibiting comparisons based on population group since at the time the study was carried out each of the education departments was responsible for the school education of children of a specific population group.

For this reason, it was decided to present the results in terms of home language(s). It is probable that almost all of those speaking Xhosa at home attended schools administered by the Department of Education and Training (DET). However, it is not possible to draw any similar conclusions about those speaking Afrikaans and/or English at home; these students could have been attending schools administered by either the House of Assembly (HoA) or the House of Representatives (HoR). The implication of this situation in terms of comparisons between students

of different population groups or education departments is that it is possible to compare students who are black (that is, Xhosa-speaking or attending schools in the DET) with those who are Coloured or white (that is, Afrikaans- and/or English-speaking or attending schools in the HoA or HoR).

There is controversy both in South Africa (Bourne, 1989; Lee, 1989; Pick, 1989; Szabó *et al.*, 1995; West and Boonzaier, 1989) and internationally (Adebimbe, 1994; Bell, 1994; Blane, 1995; Oechsli, 1995; Satcher, 1995) regarding whether it is scientifically and ethically appropriate to present data in terms of population group or race. This controversy has been fueled by the fact that race is used in various ways in research reports:

> *Currently, race is being used alternatively as a genetic variable, as a socio-situational variable (that is, to connote socioeconomic class or exposure to racism), as an ethnic variable, as a meaningless variable (depending on the context of its use), or as a political tool.*
>
> (Bell, 1994, p5)

The case against the use of race as a variable in South African research has been argued by West and Boonzaier (1989). They point out that the definitions of the population groups in South Africa are not based on the concept of race in any scientific sense; indeed, according to the Population Registration Act of 1950, the classification is based on various factors such as appearance, descent, language, and behaviour. Furthermore, the use of the population group categories in South Africa is regarded as odious by many, and may imply tacit acceptance of a discredited system (Lee, 1989). However, they do recognise that the population group to which one is assigned does have a "material bearing

on an individual's life chances in terms, for example, of access to medical resources and incidence of disease" (West and Boonzaier, 1989, p186)(Bourne, 1989). They argue that the onus is on the researcher to justify the use of population group categories by demonstrating that population group membership has resulted in individuals being treated, or responding, differently because of these official categories.

At the time that the study was carried out, the education department to which one was assigned was determined by one's population group. There is incontrovertible evidence that the education offered by the education departments was not equal (Fourie, 1990; Nasson, 1986). In addition, there were differences between the education departments in terms of the socio-economic circumstances of their students and of the neighbourhoods in which the schools were situated (City Planner's Department, 1988; Riley *et al.*, 1984). Also, there is evidence that these variables can influence the prevalence of risk behaviour of adolescents (Sachdev, 1990). Thus, even though the need for a critical definition of racial terms is endorsed, it would seem as though not reporting the results according to education department impeded a more accurate definition of groups most at risk.

The researchers were given the mutually exclusive choice by the House of Representatives of: *(i)* not including the House of Representatives in the project; or *(ii)* acceding to the demand of refraining from reporting the results according to education department. Despite the above misgivings about the latter option, it was decided that the advantages in terms of sample representativeness of including the House of Representatives outweighed the disadvantages.

5.2. CATEGORIES OF RISK BEHAVIOUR

In this section, the focus will be on Objective 1 of the study, which is to obtain estimates of the prevalence of risk behaviours in various domains according to school standard and home language(s), and gender. For each risk behaviour, the following will be presented.

a) Specific methodological considerations

Methodological considerations that are relevant for all the risk behaviours have been discussed in the section on Methodological Limitations above. However, for some of the risk behaviours there are additional methodological considerations that are specific for these risk behaviours. These considerations will be addressed before the results for each risk behaviour are discussed.

b) Comparison with previous studies

The findings will be compared with those of the previous international and South African studies that were included in the literature review. In addition, an attempt will be made to place the findings of the current study in the context of the previous work. If there are differences between the results of the present study and those from previous international or South African studies, there will be speculation regarding the reasons for this. Finally, where appropriate, possible reasons for the trends will be provided.

c) General comments

The format and content of this section varies considerably according to the domain of risk behaviour. In some cases, the implications of specific findings are presented, while in others the implications for the results for the domain of risk behaviour as a whole are presented. In other cases, the implications of the results in terms of their possible causes or explanations are discussed.

5.2.1 Suicidal behaviour

a) Specific methodological limitations

A methodological limitation of the data regarding suicidality is implied by the absence of additional data regarding the suicidal thoughts or attempts. There is thus no way of determining the extent or "seriousness" of the suicidal ideation or behaviour. This is important since there is evidence that the correlates of suicidality in terms of service utilisation, quality of interpersonal relationships, and perceived service needs increase as the reported suicidal phenomena increase in severity (Hoven *et al.*, 1995).

For suicidal ideation, questions about the duration of the ideation would assist with distinguishing between transient thoughts and a persistent preoccupation; for example, in the Diagnostic Interview Schedule for Children (DISC) (Shaffer *et al.*, 1993), this is addressed by asking whether

the respondents had thought about suicide or killing themselves both in the past six months and also whether they had thought about killing themselves a lot of the time for two weeks or more. An additional means whereby the extent of the ideation is assessed is by inquiring about whether the respondents reporting suicidal ideation had developed a specific plan for how they would kill themselves.

For suicidal attempts, individuals who reported that they had actually tried to put an end to their life in the previous 12 months could have been asked additional questions to ascertain the significance of the attempt(s). These additional questions could have included the number of times that suicide was attempted, the means that were used to do this, whether medical attention was sought and, if it was necessary, some details about the medical intervention required. The inclusion of questions about medical attention could have provided some data that would have been useful to bridge hospital and community-based studies. The importance of inquiring about these aspects is emphasised by the findings from a study by Meehan *et al.* (1992). They found that their sample of 694 first-year college students at a university in the USA, 10,4% had ever attempted suicide whereas 2,6% of the sample had ever sought medical care following a suicide attempt and 1,0% had been admitted to hospital following a suicidal attempt (Meehan *et al.*, 1992).

b) Comparison with previous studies

For reasons mentioned in the literature review, the only international study that will be included in the YRBS carried out in the USA (Kann *et al.*, 1993). Comparisons with the two previous South African studies are

hampered by the unrepresentative nature of their samples (Brink, 1992; Stewart, 1992).

Overall prevalence

The YRBS contained items regarding thinking seriously about suicide and attempting suicide in the previous year. The proportions of boys and girls in the YRBS who had thought seriously about committing suicide in the previous year were 20,8% and 37,2% respectively. These proportions were higher than the percentages of 15,5% and 24,9% for boys and girls respectively in Standard 10 in the present study who had in the previous year thought seriously about harming themselves in a way which might result in their death. The proportions for Standard 10 were higher than those in any of the other standards. It would thus appear that suicidal ideation is more common among students in the USA than in the Cape Peninsula. However, some or all of this difference may be attributed to differences in the manner in which the questions were asked; in the YRBS, there was a more explicit reference to a potentially fatal outcome which may have resulted in some students with suicidal thoughts not replying affirmatively to this question. Also, the differences between the findings in the two studies would have been attenuated if Xhosa-speaking students had been excluded from the latter study. There is no indication that the prevalence of suicide attempts differs between the two studies; in the present study, 7,8% had tried to commit suicide compared to 7,3% in the YRBS.

Gender

In both the YRBS study and the present study, the percentages of girls who replied affirmatively to each of the items was higher than that of boys. This is consistent with both clinic- and community-based studies conducted in Canada (Provonost *et al.*, 1990), France (Choquet and Menke, 1989), Great Britain (Rey and Bird, 1991; Sellar *et al.*, 1990), Hong Kong (Chung *et al.*, 1987), and Sweden (Larsson *et al.*, 1990). So far as data from South Africa are concerned, Stewart (1992) did not present her results according to gender. However, there was a preponderance of girls among adolescents seen in a general hospital in Durban following an attempted suicide (Pillay and Schlebusch, 1987; Schlebusch, 1985).

The following explanations have been advanced for the finding that the prevalence of girls who are suicidal is higher in both clinic- and community-based studies.

- Girls have a lesser degree of intentionality than boys when attempting suicide.

- Girls use less lethal methods of suicide in that they are more likely to use overdoses than use more lethal methods such as hanging and firearms (Flisher and Parry, 1994; Shaffer and Hicks, 1994). Thus, if a girl takes an overdose and subsequently decides that she does in fact not want to die or is discovered, there is a reasonably high probability that she will survive, especially if she receives medical intervention. On the

other hand, if a boy is in the process of attempting to hang himself and decides that he does not want to die, he is less likely to require medical attention; or, if he does try to hang himself and is then discovered, he is more likely to be dead.

- Girls may be more likely to direct their aggression inwards than males, who may be more likely to become assaultive.

- It may reflect differences in the epidemiology of associated psychopathology, for example depression. Although it has been established that there is a strong relationship between depression and both fatal (Brent *et al.*, 1993; Marttunen *et al.*, 1991; Shaffer *et al.*, in press) and non-fatal (Andrews and Lewinsohn, 1992; Garrison *et al.*, 1991; Roberts and Chen, 1995; Swanson *et al.*, 1992; Velez and Cohen, 1988) suicide attempts, there are inconsistent findings about the relative prevalence of depression in boys and girls who make fatal and non-fatal suicide attempts. So far as fatal suicide attempts are concerned, Shaffer *et al.* (in press) found that major depression was more common in girls who committed suicide. This contrasts with the finding of Andrews and Lewinsohn (1992) for non-fatal attempts in that they found that major depression was more common among males. It is certainly possible that the prevalence of depression differs in those making fatal and non-fatal suicide attempts. However, additional studies are required to resolve this issue. *If* it does emerge that

depression is also more common in female suicide attempters and ideators, this could contribute to explaining the differences since depression is more common in females than males (Horwath and Weissman, 1995).

The usual tendency is for males to engage in risk taking behaviour to a greater extent than females. This has been observed in the HBSC (King and Coles, 1992) and YRBS (Kann *et al.*, 1993) studies as well as the other risk behaviours included in the present study. Thus, the finding that females are more at risk than males regarding suicidality is anomalous. Any theories of adolescent risk behaviour would need to account for this anomaly.

Standard/age

In the YRBS study (Kann *et al.*, 1993), the trends for grade are not presented separately according to gender. For thinking seriously about suicide, there were no clearcut trends. This is consistent with the results for girls in the present study. Also, for boys, although there was a tendency for the proportion of students with suicidal ideation to increase with standard until Standard 9, the overlapping confidence cast doubt on the validity of this trend.

For suicide attempts in the YRBS study (Kann *et al.*, 1993), there was a trend for the prevalence to decrease with increasing standard; it decreased from 9,1 in grade 9 to 5,8 in grade 12, with the intermediate values being consistent with this trend. A similar pattern was noted in the present study. There was a trend for the

proportion of boys who had done this to decrease with increasing standard. For girls, there was a peak at Standard 7, before a trend to decreasing prevalence with standard was established.

The only previous South African study in which it is possible to seek a trend for suicide attempts according to school standard was by Stewart (1992) for white students attending a private high school. Her findings were not consistent with a decreasing prevalence with increasing standard. However, the unrepresentative nature of her sample and the relatively small number of students who had attempted suicide reduce the implications of this finding.

The findings from the present study add to the inconsistent findings that are already available. Although there is consensus that both suicide ideation and attempts seem to be less common before puberty (Shaffer and Hicks, 1994), the trends after puberty are inconsistent. Choquet and Menke (1989) found that the prevalence of suicidal ideation increased through adolescence for girls, but not boys. Studies conducted in the USA with a community probability sample (Velez and Cohen, 1988) and among junior high and high-school students (Dubow *et al.*, 1989) found no relationship between age during adolescence and the prevalence of suicide attempts (Shaffer and Hicks, 1994). It is possible that the trends for age depend on the subgroup of adolescents which is being studied.

Home language(s)

In the YRBS study conducted in the USA (Kann *et al.*, 1993), white students were more likely than Hispanic students to have thought seriously about suicide, and the Hispanic students were more likely than the black students to have done so. The difference between the white students and the black students was statistically significant. In the present study, male and female Xhosa-speaking students appeared to be less likely than those speaking other languages to have though seriously about harming themselves in a way that might result in their death in the previous 12 months. The 95% confidence intervals for the prevalence of Xhosa-speaking students overlapped with the confidence intervals for those in any of the other language categories only for Afrikaans speaking boys. Also, a smaller proportion of male and female Xhosa-speaking students indicated that they had in the previous 12 months told someone else that they intended to put an end to their life than their counterparts speaking other languages. There was no overlap of the confidence intervals for this item for either gender for any of the other language categories.

These findings are consistent with the data regarding suicide mortality in South Africa. As mentioned in the Literature review, the suicide rate for Coloured adolescents in South Africa is lower than that of white and Asian adolescents (Flisher *et al.*, 1992). Of relevance for the present study is the conclusion that, although the mortality rate for black adolescents is not available, the suicide external cause proportional mortality for blacks is similar to Coloureds (and thus lower than that for whites and Asians)(Flisher *et al.*, 1992).

Why should the prevalence of suicidal ideation be lower among black students (in the USA) or Xhosa-speaking students (in the present study)? Among the explanations that have been advanced are (Flisher and Parry, 1994): *(i)* cultural factors, such as taboos against taking one's own life; *(ii)* the extent of relatively close family ties; and *(iii)* a propensity for expressing emotion in somatic terms (Breetzke, 1988; Cheetham, 1990; Forster and Keen, 1990; Schlebusch, 1990; Shaffer, 1986). Other explanations are based on the consideration that black people are more likely to be of lower social class. Breetzke (1988) argues that those of higher social class are less likely to be able to cope constructively with life difficulties since they are not accustomed to hardship (Flisher and Parry, 1994). They may thus be more likely to regard suicide as the only available solution to a challenging life predicament. Much of the evidence supporting each of the above explanations is not based on either qualitative or quantitative research data, and clearly this represents a gap in the knowledge base.

c) General comments

For each gender, the rank order from highest to lowest prevalence with regard to language for students who had seriously thought about harming themselves in a way that might result in their death, and for those who had had told someone that they intended to put an end to their life, was as follows: Afrikaans and English; English; Afrikaans; and Xhosa. However, this trend was not preserved for those who had actually tried to put an end to their life. Not only did the rank order differ from the other two items, but it varied according to gender. The finding that there is this different

pattern for the items dealing with suicide attempts as opposed to the other items suggests the possibility that adolescent suicide attempters differ from suicide ideators or adolescents who communicate suicidal intent. If they comprised a "random" subgroup of suicide ideators and/or adolescents communicating suicidal intent in the sense that they did not differ according to important variables, one would expect similar trends to be present in the attempters, ideators, and those communicating suicidal intent.

Is there any data from previous studies supporting this possibility? Brent *et al.* (1988) found that certain risk factors for suicide (for example, a diagnosis of bipolar disorder) were more prevalent among adolescent suicide victims than among a matched control group of ideators or attempters. However, they did not attempt to document differences between the ideators and attempters. They based their decision to pool the ideators and attempters together on the basis of their finding from a previous study that the two groups are similar in terms of diverse variables (Brent *et al.*, 1986). This contrasts with the results of a study conducted among adolescent outpatients in New Zealand (Kosky *et al.*, 1990); they found that suicide attempters were more likely to be characterised by chronic family discord, substance abuse, and (for boys) a history of loss or disruption of major attachments in the previous 12 months. The results of these studies, as well as those of the present study involving high-school students in the Cape Peninsula, justify the mounting of studies that aim to document the similarities and differences between adolescent suicide ideators and those who make non-fatal and fatal suicide attempts.

Finally, the data regarding the relationships between the items yielded some noteworthy findings. Of those who had during the previous 12 months told someone that they intended to put an end to their life, 75,8%

had in the same time period seriously thought about ending their life. This could reflect poor data quality. Alternatively, the finding that approximately a quarter of those who had communicated suicide intent in the previous year had not seriously thought about ending their life in this time period could indicate that some students had threatened to commit suicide, although they did not seriously intend to carry out this threat.

Of those who had actually tried to put an end to their life, 85,7% had in the same time period actually seriously thought about harming themselves in a way which might result in their death. Data quality issues notwithstanding, it is possible that a proportion of those who attempted suicide in the previous 12 months but had not seriously considered doing so made the suicide attempt impulsively and with little or no forethought.

The students who indicated that they had communicated suicidal intent were not asked with whom they had communicated this intent. Clearly, the implications of this communication would vary according to this data. Nonetheless, the finding that more than half of those who had attempted suicide in the previous year had communicated their intent to another person indicates that there may have been a substantial number of missed opportunities to prevent the suicide attempt (Runeson, 1992).

The relatively high incidence of adolescent suicidal thoughts in the face of a substantially lower suicide mortality rate (Diekstra and Gulbinat, 1993; Diekstra *et al.*, 1995; Flisher *et al.*, 1992) has been invoked to support the argument that suicidal thoughts are a developmental phenomenon not requiring preventative action (Goldney *et al.*, 1991) However, as concluded in the Literature Review of this thesis, suicidal thoughts and attempters can be regarded as complex symptoms that are associated with subsequent suicidal events and psychological dysfunction. This study

has shown that there is a large segment of the adolescent population of the Cape Peninsula that is vulnerable in this regard, and has pointed towards certain demographic features that may be associated with increased risk.

5.2.2 Cigarette smoking

a) Specific methodological limitations

The wording of some of the questions could have given rise to some uncertainty. The first question in the section dealing with cigarette smoking was

Do you smoke at least one cigarette per day?

If the response to this question was NO, the following contingent questions were asked:

- *Have you ever smoked?* and
- *Do you intend to start smoking?*

Students who do smoke but who smoke *less* than one cigarette per day may have experienced some difficulty in responding to the questions contingent upon a NO response. Thus, a YES response to the first of the above two questions could indicate that the respondent currently smokes, but smokes less than one cigarette per day, **or** the respondent does not smoke at all but previously smoked (that is, is an ex-smoker). The second

of the above two questions (involving whether the respondent intends to start smoking) would not make sense to somebody who smokes currently but smokes less than one cigarette per day.

In the pilot studies, none of the students indicated any difficulties with these items. In addition, none of the students made any comments on their questionnaire indicating any difficulties. It would thus appear that there is not a major problem in this regard. However, it is still necessary to regard the responses to these items with some caution.

b) Comparison with previous studies

The only item for which comparisons can be made with previous studies in that involving *regular cigarette smoking*. Data are not available in the international or the South African studies reviewed in Chapter 2 of this thesis for the items addressing attempting to cease smoking, being an infrequent or ex-smoker, or intending to start smoking.

Furthermore, except for the HBSC study (King and Coles, 1992) and the study by Flisher and Chalton (1995), the items in the previous studies used for the comparisons are not phrased in the same manner. In some cases, the criterion is less stringent than in the current study; for example in the study of Strebel *et al.* (1989a) the results are reported in terms of whether the students smoke daily or occasionally. In other cases, it is unclear as to whether the criterion in more or less stringent; for example in the YRBS the students were asked whether they smoked on 20 or more of the 30 days preceding the survey (Kann *et al.*, 1993). These points should be borne in mind when interpreting the comparisons presented below.

Overall prevalence

In the present study, 18,1% of the sample reported smoking at least one cigarette per day. Comparisons with the results of the HBSC Study are of dubious validity since the age profiles are not equivalent. However, the prevalence in the present study is higher than that reported in the YRBS for high-school students in the USA, in which 13,0% of the boys reported smoking on 20 or more of the 30 days preceding the survey while 12,4% of the girls reported doing so (Kann *et al.*, 1993). It is difficult to attribute this difference with certainty to any specific factor. However, initiatives aimed at reducing the prevalence of cigarette smoking among young people in the USA are more widespread and more intense, and have existed for a longer period of time, than in South Africa (Flay, 1985, 1987). It is possible that the difference between the prevalence of cigarette smoking found in the present study compared to that in the YRBS could partly be ascribed to these preventative efforts.

The overall prevalence in the present study appears to be of a similar order of magnitude as that reported in many of the previous South African studies, particularly if one takes into account the differing age and/or standard profiles of the relevant populations. Notwithstanding this, the prevalence appeared to be higher in two studies that had samples confined to populations that can be considered at high risk for cigarette smoking, *viz.* high-school dropouts (Flisher and Chalton, 1995) and adolescents attending reform schools (Van Wyk, 1985).

Gender

There was a consistent trend in the study reported in this thesis for a greater proportion of boys to be regular smokers than girls. This result stands in contrast to the HBSC study and the YRBS, in neither of which were there consistent differences between the genders. So far as previous South African studies are concerned (Table 2.8), the prevalence of cigarette smoking appeared to be higher for boys than girls in the studies by Benatar (1979) among Coloured high-school students in the Cape Peninsula, Olivier (1977) among presumably white high-school students in Bloemfontein, and Strebel *et al.* (1989a) among black higher-primary school students in Cape Town. However, in a more recently conducted study, Disler (1990) found a higher prevalence of cigarette smoking among girls in her sample of students at a private high school in Cape Town.

In the Literature Review of this thesis, it was suggested that at the early stages of a smoking epidemic, the prevalence of smoking is higher among men than women but that this trend is reversed as the epidemic progresses (Finlayson *et al.*, 1987; Stanton *et al.*, 1989). In addition, it was hypothesised that the findings by Strebel *et al.* (1989a,b) reflect an early stage of the epidemic, the findings by Benatar (1979) and Olivier *et al.* (1977) reflect an intermediate stage of the epidemic, and the findings by Disler (1990) reflect an advanced stage of the epidemic. It is now possible to situate the findings of the present study in terms of the position of the epidemic to which they correspond. Thus, the findings for the Xhosa-speaking students could reflect an early position of the

epidemic while those of students speaking other languages could reflect an intermediate position of the epidemic.

There is the potential for the prevalence of smoking among black township girls to increase, as occurred in other countries (Fielding, 1987). Knowledge about the social, economic, and psychological factors that protect black adolescent girls from smoking would be useful in developing a strategy to abort this trend. In addition, an understanding of these protective factors may be useful in the design of intervention programmes for adolescents in general (Strebel *et al.*, 1989b).

Standard

In the present study, there was an inconsistent tendency for the prevalence of regular smoking to increase with age, with a peak at Standard 9 for boys and Standard 10 for girls. This finding is paralleled by increases with age in the HBSC Study (King and Coles, 1992) and with grade in the YRBS (Kann *et al.*, 1993). Also, in the latter study the prevalence did not increase from grade 11 to 12. It is not reported whether this applied both to boys and girls.

In the four South African studies in which trends according to age were reported (Disler, 1990; Prout and Benatar, 1983; Strebel, 1989a; Van Wyk, 1985), there was a general tendency for the prevalence to increase with age, although in two cases the trend was not preserved in the older age groups. In the Literature Review it was suggested that the findings in these two cases could

be explained by random sampling variation. Large sample sizes preclude this explanation for the present study and the YRBS.

The results of the present study thus add to the evidence that the trend for an increase in the prevalence of regular smoking with age or school standard is not necessarily maintained in the more senior school standards. Further work is required to clarify whether this trend is not maintained for all subgroups of adolescents or whether this is the case for specific subgroups (for example, males as in the present study). In addition, additional research is required to ascertain whether this reflects an actual decrease in the prevalence of cigarette smoking for adolescents in their late teens or a tendency for the smokers to be differentially absent from school, dropped out of school, or attending special schools (Tamir *et al.*, 1982; Pirie *et al.*, 1988).

Home language(s)

The findings of interest with respect to home language(s) have been discussed above in the subsection dealing with gender since there is an interaction between effects due to gender and those due to home language(s).

c) General comments

It was found that about one tenth of both the boys and girls in the sample had commenced regular smoking during or before standard 6. There are obvious implications for research and intervention that flow from this finding. The implication for research is that studies of smoking practices

of school students should not confine their sampling frames to those in high school. The implication for intervention is that children need to be exposed to prevention programmes before commencing their high school education.

There is a source of optimism in the results, and this is that 66,9% of the regular smokers have tried to stop smoking. This complements the observation that the proportion of infrequent or non-smokers who have stopped smoking increases with standard for each gender. Furthermore, only 3,6% of those who are not regular smokers intend to start smoking. However, this optimism is tempered by the following results from the study:

- 66,9% of the regular smokers continue to smoke despite their having attempted to desist; and

- more acquire the habit in each successive year than intend to do so.

It is possible that many adolescents are aware of the long-term adverse consequences of smoking, but that these disadvantages are outweighed by more immediate social pressures (Gilchrist *et al.*, 1985; Miller and Slap, 1989; Prout and Benatar, 1983; Silvis and Perry, 1987; Strebel *et al.*, 1989b).

In conclusion, the prevalence of cigarette smoking among all subgroups of high school students in the Cape Peninsula is high, except for Xhosa-speaking girls. In the light of the adverse outcomes associated with cigarette smoking that were presented in the Literature Review, this

indicates that urgent action is necessary to reduce the otherwise inevitable burden of morbidity and mortality.

This urgent action should be multi-faceted in nature (Yach, 1992), and should include at least the following aspects:

- legislative changes, such as phasing out all advertising and promotion of tobacco products, making health warnings and a statement of tar and nicotine contents mandatory for all tobacco products, outlawing cigarette vending machines, instituting a legal right to smoke-free common environments, and stopping government subsidies for tobacco cultivation (Seftel *et al.*, 1992; Townshend and Yach, 1988);

- increasing tax on tobacco products (Martin *et al.*, 1993, 1992; Yach, 1993b, 1994);

- implementation of smoking prevention and cessation programmes for adults (especially pregnant women and parents), for example using media (Baddeley *et al.*, 1988; Ehrlich, 1992; Jooste, 1991; Steenkamp *et al.*, 1991; Yach *et al.*, 1989); and

- school-based programmes aimed at preventing and postponing the onset of cigarette smoking for those who have not commenced smoking and assisting those who have commenced smoking with ceasing practicing the habit (Hunter *et al.*, 1991; Yach, 1992).

There has been one study in which the feasibility of introducing smoking prevention programmes in black schools was investigated (Hunter *et al.*, 1991). This intervention was based on social cognitive theory in that training concepts derived from this theory were used to promote children's beliefs in themselves regarding their ability to perform the health enhancing action of desisting from cigarette smoking. Thirty-one students at one school received the intervention consisting of four one-hour lessons while groups of students at two other schools served as control groups. The children who received the intervention demonstrated increased self confidence and decreased tobacco use compared to the control schools. Although this study was limited in scope and did not have a longitudinal component, it does demonstrate the feasibility of school based programmes aimed at reducing the prevalence of cigarette smoking in South African schools.

5.2.3 Alcohol use

a) Comparison with previous studies

Overall prevalence

In the YRBS study carried out in the USA (Kann *et al.*, 1993), it was stated that drinking alcohol did not include drinking a few sips of wine for religious purposes. A similar limitation on the definition of alcohol use was not included in the present study. Comparisons of the findings from the present study with those of the HBSC Study are hindered by the absence of confidence intervals and the fact that the findings are presented for the age groups 11 years, 13

years, and 15 years in the latter study. Furthermore, differences in time frames and the way in which behaviours are defined preclude comparisons for *recent alcohol use* and *binge drinking* between the findings from the present study and those of the YRBS and the HBSC Study.

The *lifetime prevalence* of alcohol use for Cape Peninsula high-school students (53,2%) appeared to be lower than for their counterparts in the USA and for the studies included in the HBSC Study. In the YRBS, the lifetime prevalence was approximately 80% for both males and females. This corresponded to the proportion for males in standard 10 in the Cape Peninsula, which was higher than the corresponding proportion for females, and also higher than the proportions for the other standards for either gender. In the HBSC Study, there was a trend for the proportion of students *aged 13 years* in most countries included in the HBSC study to have ever used alcohol to be higher than the proportion of students in the Cape Peninsula who had done so by *Standard 10.*

There are no studies addressing the reasons for high-school students in the Cape Peninsula possibly having a lower lifetime prevalence of alcohol use than high-school students in the USA. This is a serious omission since a knowledge of the factors that serve to protect Cape Peninsula high-school students from alcohol use may be useful to prevent a future increase in prevalence. Methodological aspects notwithstanding, some possible factors that could be relevant are as follows.

- Religious factors; for example, under Islam alcohol use is proscribed, and a considerable proportion of students

attending schools administered by the House of Representatives practice this religion (Central Statistical Services, 1991).

- Cultural factors, which may overlap with religious factors; attitudes to alcohol consumption may differ between South Africa and the North America and Europe.

- Economic factors; it may be that students in North America and Europe have access to greater amounts of money that can be spent on alcohol.

It is necessary to continue to monitor patterns of alcohol use in Cape Peninsula students to ensure that they do not reach international levels.

As regards previous South African studies, Parry *et al.* (1994) and Disler (1990) reported a higher *lifetime prevalence* of alcohol use than in the present study. Parry *et al.* (1994) did not include schools administered by the DET in their study; this may account their higher prevalence since the present study indicates that the lifetime prevalence of alcohol use is relatively low among Xhosa-speaking students. There are also crucial differences between the study populations of Disler (1990) and the present study in that the students in Disler's (1990) study were more likely to be English-speaking, white, of higher socio-economic class (since they were attending a private school), and older (since the sample was restricted to those in standards 8 to 10).

The only other clearly discrepant finding between the present study and previous South African studies was the finding of *Parry et al.* (1994) that 49% of the students at the University of Cape Town had consumed five or more drinks on at least one occasion in the previous 14 days. To the extent that this may reflect a difference between these students and the population of Cape Peninsula high-school students in the present study, it may be ascribed to the older age and different life situations of the two samples.

Gender

As mentioned above, the trends for gender regarding alcohol use among high-school students in the Cape Peninsula were consistent in that more boys were involved for every category of alcohol consumption.

With isolated exceptions, this trend was also present in the HBSC study carried out in Canada and Europe (King and Coles, 1992), the YRBS study carried out in the USA (Kann *et al.*, 1993), and previous studies carried out in South Africa (Table 2.14). However, there was a tendency for the differences between the genders to be relatively larger in the present study (and previous studies carried out in South Africa) compared to the previous international studies. Indeed, although the gender differences were particularly marked for Xhosa-speaking students, the differences between the genders were present across all the standards and home languages. Why should this be the case? No explanations could be unearthed in the literature for the apparent tendency for gender to exert a stronger influence on alcohol consumption patterns

among South African adolescents compared to their international counterparts. It is possible that this tendency can be ascribed to a more pervasive influence of feminism and opposition to gender discrimination in North America and Europe than in South Africa. It is important to monitor differences between the genders in the alcohol consumption patterns of South African adolescents. It may occur that the differences between the genders could become attenuated in the face of increased gender equality. It would be important to ensure that this equality is not accompanied by an increase in the health risks associated with greater alcohol consumption among males.

Grade/age

As mentioned above, for those variables for which the percentage of positive replies is sufficient to justify an analysis of trends according to standard, there was in almost all cases an increase in prevalence with school standard. This is consistent with the previous international studies. In the one study conducted in South Africa in which sufficient data is provided to enable the identification of trends according to age (Disler, 1990), there were no consistent trends between the ages between the ages of 17 years and ≥ 18 years. The presence of consistent trends for the senior standards in the present study increases the probability that the finding of Disler (1990) is a chance finding (possibly due to a small sample size).

Race/ethnicity

In the YRBS study carried out in the USA (Kann *et al.*, 1993) there was a trend for the prevalence of drinking to be higher among white and Hispanic students than black students. Among previous studies carried out in South Africa, the prevalence of alcohol misuse appeared to be lower among "Coloured" high-school dropouts (Flisher and Chalton, 1995) than English-speaking white students attending a private high school in Cape Town (Disler, 1990).

The findings from the present study are consistent with the above international and South African work in that the proportion of English-speaking students who had used or misused alcohol tended to be higher than those speaking other languages while the proportion of Xhosa-speaking students who had done so tended to be *lower* than those speaking other languages.

The finding for Xhosa-speaking students is important in the light of evidence that urbanising sectors of the adult black population are particularly at risk for alcohol-related problems. Rocha-Silva found that 37,2% of males and 24,8% of females in informal settlements misuse alcohol, and that the proportion of drinkers (especially female drinkers) is higher in informal settlements than in towns, urban metropolitan centres, or rural areas (Rocha-Silva, 1991, 1994). One factor influencing the drinking habits of binge drinkers attending a state-aided ("Model C") school in Cape Town was the attitudes of the fathers of the adolescents, who tended to increase the incidence of binge drinking both by explicit encouragement and role modeling (Ziervogel, 1994; Ziervogel *et al.*, 1994). If this is

also valid for black township adolescents, one might anticipate that the drinking patterns of adolescents in peri-urban informal settlements would be influenced not only by the direct effects of urbanisation but also by the alcohol misuse of their parents. It will be important to monitor the extent of alcohol consumption of black urban adolescents to ascertain the extent to which this is occurring.

c) General comments

As mentioned in the Literature Review, the short-term consequences of alcohol use, such as traumatic injury and death, are of more immediate relevance to young people. Students who drink five or more drinks on one occasion are particularly at risk for such outcomes. It is a cause for concern that approximately 15% of the sample (and approximately 34% of boys in standard 10) had consumed five or more drinks on one occasion in the previous two weeks. No data were gathered regarding the context in which this bingeing took place; this information is necessary to draw conclusions regarding the probability of adverse consequences. However, in the section of the questionnaire involving road-related behaviour, it was found that 8% of those who had driven a motor vehicle on a public road had done so while under the influence of alcohol or cannabis; clearly, these students were exposing themselves and others to risk of traumatic injury and death.

In contrast to the incontrovertible short-term consequences of binge drinking, the long-term consequences of adolescent alcohol consumption are indirect. For a proportion of adolescents, alcohol misuse is a temporary phenomenon. However, there is evidence from studies conducted in France (Weill and Le Bourhis, 1994), the USA (Chen and

Kandel, 1995; Harford, 1993; Schulenberg *et al.*, 1994), Sweden (Andersson *et al.*, 1989; Andersson and Magnusson, 1988), and the United Kingdom (Ghodsian and Power, 1987) that alcohol misuse in adolescence tends to persist into adulthood (Edwards, 1973; Plant, 1979). Although this finding has not been replicated in South Africa, the Cape Peninsula high-school students who reported misuse alcohol may be at risk for the long-term consequences of alcohol misuse that were enumerated in the Literature Review.

Alcohol misuse in adolescence can have implications for the use of illicit drugs. Kandel has proposed that adolescents progress through a series of stages of drug use, and that problem drinking occurs after cannabis use and before "hard" drugs such as heroin (Kandel, 1975b; Kandel *et al.*, 1978). According to this theory, drug use of one stage is carried over into the next, giving rise to multiple drug use. Previous research and the results of the present study indicate that multiple drug use is not found to a substantial extent among South African adolescents. To the extent that this may occur in the future, the data presented above indicate that substantial numbers of high-school students in the Cape Peninsula may be at risk for the progression described by Kandel (1975b).

Despite the challenges associated with changing adolescent drinking behaviour (Bailey, 1989; Farrel, 1988; Plant *et al.*, 1982), there is sound evidence that such efforts can result in sustained change (Botvin *et al.*, 1995). However, uniform programmes which fail to account for the cultural context of drinking and its particular meanings for different groups (Davis and Smith, 1982; Plant, 1979) are unlikely to be successful. In addition, failing to distinguish between drinking which may be normative and that which constitutes a health risk could lead to exaggeration of the

problem (Bagnall and Plant, 1987; Sharp and Lowe, 1989) and the inefficient use of scarce resources.

5.2.4 Drug use

a) Comparison with previous studies

Overall prevalence

The proportion of students who had *ever smoked cannabis* was less than that reported in previous international surveys; while 7,5% of the current sample had ever smoked cannabis, in Canada 26% of males and 24% of females had done so (King and Coles, 1992) while in the USA the equivalent figures were 29,8% and 32,8% respectively (Kann *et al.*, 1993).

It is difficult to draw conclusions about the prevalence of *current cannabis smoking* in the present study compared to the international studies reviewed in Chapter 2 since the time periods are defined differently. However, for females, it is possible that current use is more common in the USA. In that country, 16,7% had used cannabis during the previous 30 days, whereas the proportion of girls in the present study who had done so in the previous seven days ranged from 0,3% to 2,1% in the various standard and language groups.

There are only two studies in which the prevalence of cannabis smoking by South African school students is addressed (Table 2.17). Disler (1990) reported a prevalence of 24,6% for girls and 20,3% for boys in their sample of high-school students attending a private high school in Cape Town, whereas Du Toit (1978) reported prevalences of 5,9% or less for students of different population groups attending various high schools in Natal. The discrepancies between the findings in these contexts were clearly not only due to the differences in the time and places of the studies since the results from the present study were closer to those of Du Toit (1978) than Disler (1990).

The use of cannabis and methaqualone together does not occur to any appreciable extent in Europe and North America, so it was not included in the previous international studies. The very low prevalence of use of this combination in the present study (1,6%) is compatible with the findings from the three previous studies conducted in South Africa in which this was examined (in which the highest prevalence was 3,5%) (Du Toit, 1978; Flisher and Chalton, 1995; Simon, 1982) (Table 2.17). It would thus appear that the prevalence of the use of cannabis and methaqualone together is not a major public health problem in the samples in which this has been examined.

Although there were no questions about the use of injectable drugs in either the YRBS study (Kann *et al.*, 1993) or the HBSC study (King and Coles, 1992), the latter study did inquire about use of heroin, morphine, and opium. By the age of 15 years, 4% of the boys and 3% of the females had used either of these substances (King and Coles, 1992). It is impossible to draw meaningful

comparisons with the prevalence of 1,6% in the present study since data are not available regarding whether these drugs were injected or not. Previous South African studies also reveal very low prevalences of injectable drug use. One can conclude that these practices do not pose substantial problems in the samples studied.

Solvent use was included in the HBSC study for Canada (King and Coles, 1992). In contrast to the findings for cannabis, the prevalences were lower in this study than among high-school students in the Cape Peninsula; the lifetime prevalences for solvent use were 7% and 5% for boys and girls respectively aged 15 years for the Canadian students, compared to 10,9% for the Cape Peninsula students. The absence of confidence intervals in the HBSC study (King and Coles, 1992) precludes firm conclusions. Only two previous South African studies included solvent use in studies involving high-school students. The findings in the present study appear to be higher than those observed by Disler (1990) in her study involving students at a private high school in Cape Town (where the prevalence was less than 3%) and similar to those reported by Du Toit (1978) among high-school students in Natal (where the prevalences ranged from 9,7% for Indian students to 16,6% for African students).

Gender

The trend in the present study for the prevalence of cannabis use to be higher in male than female students was not observed in the YRBS study carried out in the USA (Kann *et al.*, 1993). For both lifetime prevalence and use in the previous 30 days, a greater

number of females had used cannabis, although the overlapping confidence intervals indicate that this difference is of dubious significance. Differences between the genders were minimal for the Canadian students participating in the HBSC study (King and Coles, 1992). There is no evidence of a significant difference between the genders In the only two previous South African studies in which this was examined (Disler, 1990; Flisher and Chalton, 1995). For solvent use, the trend for the prevalence to be higher among males than females was not as conspicuous among Canadian students participating in the HBSC study (King and Coles, 1992) as in the present study.

School standard

The increase in the prevalence of lifetime cannabis use that was observed in the present study was also observed for the Canadians in the HBSC study (King and Coles, 1992), the USA students in the YRBS study (Kann *et al.*, 1993), and the only previous South African study in which this variable was examined (Disler, 1990). There was an increase with school standard for the prevalence of use in the previous 30 days in the YRBS study. An conspicuous increase in solvent use with age was not observed among the Canadian students in the HBSC study, but the numbers involved were small.

An implication of this increase in prevalence with age is that, although prevention programmes should begin at a young age, they should not neglect older adolescents since adolescents can begin using the drugs at any age.

Population group

The finding that there were no differences in the lifetime prevalence of cannabis use between those speaking Xhosa and those speaking other languages is consistent with:

- the absence of racial/ethnic differences for this variable in the YRBS study carried out in the USA (Kann *et al.*, 1993); and

- the finding that there were no conspicuous differences between Xhosa-speaking and other males for smoking cannabis once per year or less in the only previous South African study in which this issue was addressed, which was conducted among high-school students in Natal (Du Toit, 1978).

However, the prevalence of recent cannabis use (i.e. in the previous seven days) and recent heavy cannabis use (i.e. on four or more occasions in the previous seven days) was higher for Xhosa-speaking males than males speaking other languages. Differences in the definitions of the variables notwithstanding, this is *not* consistent with the finding in the YRBS that there were no differences between the racial/ethnic groups for the prevalence of recent cannabis use. However, it *is* consistent with the finding of Du Toit (1978) that a greater proportion of Africans smoked cannabis daily or more frequently, or weekly or more frequently, than those belonging to other population groups.

The ratio between lifetime and recent use among Xhosa-speaking males is different than for males speaking other languages. Although a considerable number of non-Xhosa-speaking males have previously smoked cannabis, a far smaller proportion have used the drug recently. Conversely, among Xhosa-speaking males the difference between the prevalence of lifetime and current use is smaller, suggesting a more entrenched pattern of use. A similar trend is also present for cannabis and methaqualone use, although it is not as conspicuous.

As mentioned in the Literature Review, cannabis use by adult males is accepted in somes "African cultures" in South Africa. It is possible that this partly accounts for the observed differences between Xhosa-speaking males and other males in the present study. Conversely, this practice is not acceptable for females in "African culture", and this could partly explain the low prevalence for female Xhosa-speaking students.

b) General comments

The consistently large disparity between the extent of lifetime and recent use indicates that most drug use is of an experimental and temporary nature for the majority of Cape Peninsula adolescents. Drug use is confined almost exclusively to cannabis and solvents, and other illicit drugs are shown to be used rarely among this population. Frequent drug use is also uncommon and, with the exception of a subgroup of Xhosa-speaking male cannabis smokers, frequent users of any drug consistently comprise less than 1% of the total sample.

Of all subgroups it emerges that Xhosa-speaking males are possibly most at risk for continued drug use and its negative consequences. Their behaviour goes further than experimentation.

Despite its illicit nature, drug use in itself does not constitute abuse for the majority of adolescents but rather a developmental phenomenon. In most cases it is a short-lived experimentation (Bailey, 1989; Yancy *et al.*, 1972). Due to adolescent curiosity, preventive programmes could have a paradoxical effect in that experimentation might be encouraged (Van der Burgh, 1983). There may nevertheless be a need for some form of preventive activity as the prevalence of drug use is known to peak in early adulthood (Kandel, 1993). Where school-based preventive programmes are offered, drug awareness should be incorporated as part of a general health promotion effort rather than as a separate programme.

There has only been one study reported in South Africa involving an anti-substance abuse health promotion intervention (Goldstein, 1994). This was a report of a series of focus group discussions that were arranged to understand the attitudes of high school pupils to the use and abuse of substances. This information was used to plan a "substance abuse week". Details about the week were not provided, and there are no reports of the effectiveness of the intervention.

There does appear to be a subgroup of adolescents for whom drug use has clearly exceeded the limits of curiosity. Intervention should be aimed at this group who are at risk for more serious drug-related disorders. Schools would be a suitable venue for case finding and referral to the appropriate facilities or programmes. An important task also lies in identifying those adolescents who have progressed further down the

continuum of drug stages and who may already have dropped out of school as a result of heavy use (Clayton and Ritter, 1985; Kandel, 1975b; Kandel *et al.*, 1978). It is individuals from this group who are most likely to present at drug rehabilitation centres with serious drug abuse problems (D. Wilson, personal communication).

5.2.5 Road-related behaviour

a) Comparison with previous studies

As implied in the Literature Review, there is a relative absence of data from both international and South African studies that are suitable for comparison with the present study. There are no data from Europe or Canada. Only two items from the YRBS study carried out in the USA (Kann *et al.*, 1993) are relevant for the present study, *viz.* those involving safety belt and motorcycle helmet use. In addition, two items from the National Adolescent School Health Survey (NASHS) (American School Health Association *et al.*, 1989) carried out in 1987 are relevant, *viz.* those involving travelling in a vehicle with a driver who had used drugs or alcohol in the previous month and riding a motorcycle or minibike. So far as South African studies are concerned, the only relevant information is from the study by Flisher and Chalton (1995) involving teenage high-school dropouts in a working-class community in the Cape Peninsula. The discussion below will thus refer only to these studies.

Overall prevalence

Those behaviours for which data are available indicate that high-school students in the present sample are *less* at risk than high-school students in the USA.

In the NASHS study (American School Health Association *et al.*, 1989), 38,6% had in the previous *month* travelled in a vehicle with a driver who had *used* drugs or alcohol; in the present study, only 14,5% of those who had travelled in a motor vehicle in the previous *year* had done so knowing or strongly suspecting that the driver was *affected* by alcohol or cannabis. It would appear that a greater proportion of high-school students in the USA engage in this behaviour. Although the criterion for the study conducted in the USA is weaker than that for the present study (in that there may drivers who had used the substances but were not affected by them), the shorter time period in the study conducted in the USA would influence the results in the contrary direction.

In the NASHS (American School Health Association *et al.*, 1989), 59,9% reported riding a motorcycle or minibike; the question was not more precisely defined. In the present study, only 32,5% had been on a motorcycle in the previous year. Differences in the manner in which the questions were framed notwithstanding, it would appear that the riding of motorcycles is more common among high-school students in the USA than in the Cape Peninsula.

According to the YRBS study (Kann *et al.*, 1992), 27,7% always used a safety belt while travelling in a car or truck driven by

someone else, and 39,2% of those who rode a motorcycle always wore a motorcycle helmet. In the present study 62,7% wore a seat belt on the last occasion they travelled in the front passenger seat of a motor vehicle, while 52,1% of those who had been on a motorcycle in the previous year had always used a helmet in the previous year. Although it would appear that students in the Cape Peninsula are more likely to use seat belts and motorcycle helmets, it should be borne in mind that the different manners in which the questions were phrased may have affected this comparison.

Notwithstanding the possibility that high-school students in the Cape Peninsula may be less at risk for the adverse consequences of road-related behaviour than those in the USA, the behaviour of substantial numbers of high-school students in the Cape Peninsula place them at risk for injury or death from road-related incidents. In addition, there is some evidence that there may be a trend for the risk to be higher in Cape Peninsula high-school students than in high-school dropouts. When comparing the road-related risk behaviours of the high-school dropouts with age-matched controls attending a school in the neighbourhood, a trend was present for those still attending school to be more likely to engage in road-related risk behaviour (Flisher and Chalton, 1995). There are no obvious reasons why this should be the case. Perhaps the dropouts are more socially isolated and thus more likely to spend greater amounts of time at home, thus exposing themselves to fewer opportunities to engage in road-related risk behaviours.

Gender

For the two items for which data are available in the YRBS (Kann *et al.*, 1993), *viz.* safety belt and motorcycle helmet use, the trend observed in the present study for males to be more at risk was not confirmed. Confidence intervals or other indications of the significance of differences between the means were not provided in the NASH Study (American School Health Association *et al.*, 1989). This makes it difficult to interpret the data. Nonetheless, it would appear that in both the NASH Study and the present study there was a trend for boys to be more likely to ride a motorbike than girls. In addition, in both studies, there are no clear trends for gender for travelling in a vehicle as a passenger with a driver who was affected by alcohol or drugs.

Why should there be differences in the trends for gender between the present study and the YRBS (Kann *et al.*, 1993) for the items involving seat belt and motorcycle helmet use? Assuming that these differences in the trends are not spurious, it may be that sex roles are more rigidly defined in South Africa than in the USA. To the extent that a propensity to take risks differentially characterises males, the differences in the trends for gender may reflect these more rigid definitions of sex roles. However, analytical studies are required to confirm the validity of this speculation.

It has been observed that despite controlling for duration of engaging in road-related risk behaviour, adolescent boys remain at elevated risk for injury and death (Baker *et al.*, 1984; Withers and Baker, 1984). This is exemplified by the finding that, not only do boys travel a greater distance in motor vehicles than girls, but they

also have higher death rates per kilometre travelled (Baker *et al.*, 1984). This indicates that the manner in which they drive is different from that for girls. Possible reasons for this include constitutional temperamental differences, societal role expectations, and associated aspects such as alcohol abuse (which is more prevalent in males) (Kandel, 1993; Rivara *et al.*, 1982).

In the study conducted among high-school dropouts in the Western Cape, there were no consistent trends according to gender. However, the confidence intervals for the estimates for each gender are so broad that the observed differences are of minimal interest.

School standard

There were no inconsistencies between the trends in the YRBS (Kann *et al.*, 1993) and NASHS (American School Health Association *et al.*, 1989) and the trends in the present study. Where there is a trend according to school standard/grade, there is generally an increase in the prevalence of the risk behaviour with increasing school standard/grade. Besides increasing exposure, the high rates of traffic-related injury among 15 to 24-year-olds have been attributed to characteristics such as inexperience, risk-taking as drivers of motor vehicles, and little experience with and poor judgment regarding the use of alcohol and drugs (Baker *et al.*, 1984; Halperin *et al.*, 1983; Havard, 1979).

One exception to the other trends for school standard is the decrease in the prevalence of being injured by a motor vehicle

while walking or standing, for which there is a consistent trend for the prevalence to decrease with gender with increasing standard/grade. This finding for pedestrian injuries is consistent with the results of an analysis of patients seen at the Trauma Unit of Red Cross War Memorial Children's' Hospital in Cape Town (Kibel *et al.*, 1990a). It was found that the proportion of transport-related injuries sustained as pedestrians declined from 74,1% in the age group 5 to 9 years to 64,7% in the age group 10 to 12 years (Kibel *et al.*, 1990c). It is also consistent with Van der Spuy's finding that the percentage of adolescents in the Cape Metropolitan area injured in traffic accidents who were injured as pedestrians decreased from 44,9% for the age group 10 to 14 years to 25,2% for the age group 15 to 19 years (Van der Spuy, personal communication). With maturity it would appear that the ability of children to take steps to prevent injury as pedestrians improves, possibly through their being less impulsive and more capable of appreciating the dangers inherent in a situation.

Home language

There are no data from previous studies that are directly relevant for the findings for home language in the present study. Except for the items involving driving without a license, vehicle overcrowding, and driving while under the influence of alcohol, Xhosa-speaking students were less at risk than those speaking other languages. It is possible that the living circumstances of Xhosa-speaking students can partly account for this (Flisher *et al.*, 1992; Kibel *et al.*, 1990a; Waller *et al.*, 1989). Because Xhosa-speaking students are more likely to be poor than those speaking other languages, they

are less likely to have access to motorcycles. When they do have access, it is more likely that this would be rare event; this could make them more cautious and hence more likely to ride with a helmet since increased exposure to potentially dangerous situations such as motorcycle-riding may reduce the extent of perceived risk (Flisher, unpublished document). The amount of time that they spend in motor vehicles may be less than for those speaking other languages, thus reducing the probability of being injured in motor vehicle accidents. Finally, there are likely to be fewer cars available in poor areas for students to drive, thus accounting for a lower prevalence of driving without a license.

Conversely, some of the items for which the prevalence was higher for Xhosa-speaking students may also reflect economic differences; for example, driving an overcrowded vehicle (for which the prevalence was higher for Xhosa-speaking students compared to those speaking other languages at home) could partly be determined by a shortage of vehicles to reach a destination.

It is probable that with political and economic changes and increasing urbanisation the patterns of risk behaviour for Xhosa-speaking students will change. Indeed, Xhosa-speaking students may become more vulnerable to certain types of road-related injuries. It is important to document the secular trends for road-related risk behaviour among Xhosa-speaking students in the light of this possibility (Manciaux and Romer, 1986).

b) General comments

It can be misleading to discuss road-related "accidents" as though all were similar events (Baker *et al.*, 1984). To assess their overall significance for the prioritizing of interventions each area of behaviour needs to be separately contextualised.

As discussed above, younger adolescents are more likely than older adolescents to be involved in pedestrian accidents. The importance of pedestrian deaths in relation to road-related deaths across all ages is indicated by their generally accounting for the second largest number of deaths in this category (Baker *et al.*, 1984). Furthermore, in the Cape Metropolitan Study in which a total of 5 815 cases of trauma from nine hospitals were studied, pedestrian cases accounted for the largest number of road-related injuries in the 10 to 14-year age group; 44,9% of all road-related injuries in this age group were sustained by pedestrians compared to 26,1% for drivers and 29,0% for passengers. In the 15 to 19-year age group pedestrians accounted for fewer injuries than drivers or passengers. In several European countries successful attempts have been made by environment modifications to improve the safety of pedestrians (Avery and Avery, 1982). In South Africa, much remains to be done about ensuring adequately designed sidewalks, lighting and sufficient playgrounds for children. This applies particularly to communities with low socio-economic status as indicated by the results for Xhosa-speaking students discussed above.

The fact that 47,9% of those who had driven a motorcycle in the previous year had done so without a helmet is cause for concern. However, the finding that a third of the sample had been on a motorcycle at all during the previous year indicates that a large number of adolescents in the

Cape Peninsula are at risk for injury or death. This is exemplified by data from the USA, where two thirds of all motorcycle deaths occur in the 15 to 24-year age group (Halperin *et al.*, 1983). Not only is the mortality rate for motorcylists involved in motor vehicle accidents five to fifteen times higher than for drivers and passengers (Baker *et al.*, 1984; Riley, 1975), but the nature of the injuries sustained is comparatively more severe (Riley, 1975). Although mandatory helmet use has a considerable impact on the proportion of fatal injuries, the dangers remain exceedingly high (Watson *et al.*, 1981).

Injuries to passenger vehicle occupants are the prime cause of motor vehicle accident fatalities. In the United States among males aged 15-19 years, one-third of *all* deaths are due to injuries sustained as motor vehicle occupants (Baker *et al.*, 1984). In the Groote Schuur Hospital Trauma Unit, more than half of the road-related injuries among adolescents aged 13 to 19 years in 1991 involved vehicle occupants (Knottenberg, personal communication). Finally, in the Cape Metropolitan Study in which cases presenting with trauma at nine hospitals were analysed, 67,8% of all road-related traumatic injuries in the 10 to 19-year age group were sustained by drivers or occupants of vehicles (Van der Spuy, personal communication). These data are consistent with the findings from the present study that 8,5% of the sample, with a disproportionate number of older boys, report being involved in motor vehicle accidents. Data regarding the nature of any injuries sustained and whether medical attention was necessary were not gathered. It is thus possible that a large proportion of those involved in motor vehicle "accidents" were not seriously injured. However, there is evidence that involvement in motor vehicle accidents in adolescence is a risk factor for fatal injury later in life (Halperin *et al.*, 1983).

There was a discrepancy between knowledge and behaviour in safety belt use. Of the sample, 78,5% were of the opinion that wearing a seat belt reduces the chance of being injured in a motor vehicle accident whereas only 62,7% used one on the last occasion in the previous year that they were travelling in the front passenger seat of a motor vehicle when there was a seat belt available. The finding that more than a third of the sample did not use a seat belt is even more noteworthy in the light of the legal obligation to do so (Goldbaum *et al.*, 1986). This finding highlights the consensus that raising awareness of the risk associated with a behaviour is not sufficient to result in behaviour change, even in the presence of legal prohibitions (Dershewitz and Williamson, 1977; Halperin *et al.*, 1984; Robertson and Zador, 1978; Withers and Baker, 1984). This suggests that increased priority should be given to measures that do not rely on personal responsibility. An example of such a measure would be legislation compelling vehicle manufacturers to fit air bags in their cars, thereby protecting the occupant automatically from the full effects of a collision (Withers and Baker, 1984; Halperin *et al.*, 1983). There is international evidence that these measures can be more effective than educational or legal approaches aiming to reduce morbidity and mortality from traffic incidents (Avery and Avery, 1982; Dershewitz and Williamson, 1977; Halperin *et al.*, 1983; Robertson, 1981; Withers and Baker, 1984).

The aetiology of injury involves a complex interaction between individual, agent of injury, and environment (Brown and Davidson, 1978; Haddon, 1980; Kibel, 1990; Tsuang *et al.*, 1985). By recognising this, and also by involving communities, professionals, and government, a large proportion of adolescent death and injury from road-related events is potentially preventable (Sibert *et al.*, 1981). The findings in the present study indicate that the behaviour of substantial numbers of high-school students in the Cape Peninsula places them at risk for traffic injury.

5.2.6 Violent behaviour

a) Specific methodological considerations

A specific methodological factor that is relevant for violent behaviour is based on the possibility that groups within the sample are differentially habituated to experiences of violence. As a result, interpretation of what constitutes an act of violence may have varied considerably. A student growing up in an environment characterised by low levels of violence may interpret bruises sustained in a physical fight to constitute a "physical injury", whereas the same bruises may have been regarded as trivial and not constituting a "physical injury" by a student growing up in a community with a high level of violent crime.

This issue may have been avoided by more precise definitions of what constitutes the various violent acts. However, this would not have been possible in the light of the resulting increase in the length of the questionnaire. Even though the pilot studies did not give any cause for concern regarding this aspect, the conclusions presented below may have been subject to this source of bias.

b) Comparison with previous studies

Overall prevalence

There is a lack of comparable data from international studies with which the results of the present study can be compared. The HBSC study carried out in Europe and Canada did not include questions regarding physical violence, although questions on bullying were included (King and Coles, 1992). The YRBS study carried out in the USA included items regarding involvement in "at least one fight" during the 12 months preceding the survey and weapon carrying (Kann *et al.*, 1993). The responses to the former question are obviously not comparable with those of the present study. However, it would appear that the prevalence of weapon carrying is higher among students in the USA compared to the Cape Peninsula. In the USA, 26,1% reported carrying a weapon such as a gun, knife or club on at least one day during the previous 30 days, whereas in the Cape Peninsula only 5,2% had carried a knife as a weapon during the previous four weeks and 3,8% had carried any other kind of weapon.

The items in the NASHS (American School Health Association *et al.*, 1989) correspond more directly to those in the present study. There are no estimates of precision (such as confidence intervals) in the NASH study, which implies that any comparisons with findings of the present study should be regarded with some caution. Also, the items are worded differently in the NASH study compared to the present study; for example, in the NASH study the

students are asked whether they had been attacked, whereas in the present study they were asked about being physically injured.

In the NASH study, 13,0% reported being attacked at school in the previous year (American School Health Association *et al.*, 1989). In the present study, the students were asked about being physically injured by another student or by a member of staff in the same time period, the prevalences of which were 12,7% and 7,2% respectively. It is possible that some students were injured by both students and staff members, which implies that the findings from the NASH study and the present study are not contradictory. However, the prevalence of hitchhiking appeared to be higher in the Cape Peninsula; 7,1% had hitchhiked home from beyond the neighbourhood at night in the previous year, whereas only 9,6% had hitchhiked in any circumstances in the USA in the same time period.

The respondents in the NASH study were asked about walking alone late at night whereas those in the present study were asked about walking home alone at night from beyond the neighbourhood. The greater prevalence in the former study (73,4% vs. 25,0%) could be attributed to the differences in the questions.

In conclusion, the only comparisons about which one can be confident are that the prevalence of weapon carrying is higher among school students in the USA whereas the prevalence of hitchhiking is higher in the Cape Peninsula. As regards the former comparison, it was intimated in the Literature Review that the mortality rate from assault appears to be higher for youth in the USA compared to South Africa. The higher rate of weapon

carrying may reflect this discrepancy in two ways. Weapon carrying may not only cause a higher homicide mortality rate but may be a result of it in that students may feel more vulnerable in the USA and thus feel the need to take steps to protect themselves.

As regards hitchhiking, the possibly higher rates in South Africa may reflect one or both of the following:

- less access to transport as a result of economic factors or less developed public transportation systems; and

- less perceived vulnerability (which may be related to the discrepancies in mortality statistics mentioned above).

It must be emphasised that the above explanations for the differences in the prevalences of weapon carrying and hitchhiking are speculative. Additional studies are required to investigate whether they are valid.

The only previous study carried out in South Africa in which analogous aspects of violent risk behaviour were considered involved high-school dropouts in a working-class community in the Cape Peninsula (Flisher and Chalton, 1995). As for the other domains of risk behaviour included in this thesis, the wide confidence intervals in the study involving dropouts reduce the power to detect differences between the two samples. Indeed, there is an overlap in the 95% confidence intervals for the prevalences of each applicable risk behaviour in the two studies. This is consistent with the finding that there were no significant

odds ratios (adjusted for age) for any of the violent behaviours for those still attending a school located in that community relative to the dropouts (Flisher and Chalton, 1995).

Gender

The finding that males are more at risk for violent behaviour is robust; not only was it observed for all but one of the items in the present study, but it was present in both the HBSC study carried out in Europe and Canada (King and Coles, 1992) and the YRBS (Kann *et al.*, 1992) and NASH (American School Health Association *et al.*, 1989) studies carried out in the USA. As mentioned in the Literature Review, factors that could account for this finding include biological factors, a greater propensity for risk taking, a higher prevalence of associated psychopathology, and a socialisation-based tendency to act out hostile impulses.

School standard

The results from the present study are consistent with those of previous international studies in the following aspects.

- *For several items there are no consistent trends.*

- *The risk of being physically injured declined with school standard.* In the YRBS there was a decline with school grade in the prevalence of being injured at least once in a physical fight in the previous 12 months (Kann et al.,

1993), and in the NASH study the proportion of those who had been attacked at school and (for boys) outside of school in the previous 12 months declined between grades 8 and 10 for both boys and girls (American School Health Association et al., 1989). There are several possible reasons for this decline, including:

- some of the injuries or fight referred to may have consisted of squabbles arising from altercations between younger children as opposed to the more dangerous physical fights of older children;

- older children may be less vulnerable to being attacked since they are more likely to be able to defend themselves.

- *The risk of being physically injured by another person while travelling increased with school standard.* In the NASH study (American School Health Association *et al.*, 1988), the proportion of students who had hitchhiked or walked home alone late at night increased for both boys and girls from Grade 8 to Grade 10. However, the differences were not large and confidence intervals are not provided, which imply that these trends may not be valid. However, they were consistent with the finding from the present study that the risk for being physically injured in getting home at night from beyond the neighbourhood increased with school standard (although this trend was not consistent for walking home alone at

night from beyond the neighbourhood). The increased risk with increasing school standard may reflect greater mobility and independence of older adolescents compared to their younger counterparts.

Population group

The only study gathering comparable data regarding violent behaviour in which racial differences are addressed is the YRBS study carried out among high-school students in the USA (Kann *et al.*, 1993). As mentioned in the Literature Review, it was found that black students were more likely than white or Hispanic students to have been involved in a physical fight in the previous 12 months and to have carried a weapon in the previous 30 days (although the only statistically significant differences were between white and black students). The contrary finding was obtained in the present study; Xhosa-speaking students were *less* likely than those speaking other languages to injure others. They were also less likely to be injured by another student or a staff member at school; this also indicates a lower prevalence of violent activity on the part of Xhosa-speaking people since those perpetrating acts of violence in these schools would in all likelihood also be Xhosa-speaking.

The higher prevalence of acts of interpersonal violence among African Americans is consonant with the mortality data for the USA which indicates that African Americans are more likely than European Americans to die from homicide. Mortality rates for black adolescents in South Africa are not available (Flisher *et al.*, 1992). However, the proportional mortality for death from assault is higher

for blacks and Coloureds than whites and Asians (Flisher *et al.*, 1992). Methodological considerations notwithstanding, it is possible that the relatively high proportional mortality rate for black adolescents can be ascribed to: *(i)* those violent acts that do take place being of a serious nature; or *(ii)* a relatively high prevalence of weapon carrying and violence perpetrated by a non-school-going population.

One would expect that the Xhosa-speaking respondents in the present study had been exposed to higher levels of social disintegration and violence than those speaking other languages. It has been postulated that children growing up in these violent circumstances would internalise violence as being a normal and appropriate response to social situations in which the individual or group is threatened (Dawes, 1994). However, in the present study, the levels of violence displayed by Xhosa-speaking students were *lower* than those speaking other languages. This finding is consistent with other research which indicates that the link between exposure to violence and subsequent use of violence is not simple (Dawes, 1994; Widom, 1991). On the contrary, it is mediated by a range of socio-political, economic, social, and personal forces (Bulhan, 1979; Butchart and Brown, 1991; Dawes, 1990).

Explanations that have been advanced for the relatively low prevalence of violent behaviour among Xhosa-speaking students include (Dawes, 1990; Schärf, 1990):

- the availability of supports in the family and community;

- an intact tradition of strong cultural codes of respect for seniority; and

- a tradition of extended family guardianship over the young.

c) General comments

Although socio-political factors have been central in understanding violence in South Africa (McKendrick and Hoffmann, 1990a), the focus of this study is the contributory role of demographic and developmental factors in this regard.

A complex interaction of factors is likely to shape different patterns of violent behaviour among adolescents from different language and cultural backgrounds. There is insufficient data in the present study to enable these factors to be addressed. However, it is probable that the following factors are pertinent to the findings in the present study, in addition to the factors mentioned previously. These factors are discussed here (as opposed to in the section on home language above) since they may be implicated in the findings for all the language groups and the evidence for their explaining the trends observed is at best tenuous.

Social Marginalisation

One would expect higher levels of violent behaviour among adolescents from socially marginalised groups, in which families and entire communities have suffered dislocation (for example,

through forced removals resulting from the Group Areas Act). Indeed, studies of gang formation in "Coloured" townships in Cape Town have ascribed their pervasiveness to the breakdown of community structures and a deteriorating economy. Gang subculture has also been observed to exert a powerful impact on value formation among this community's youth. Specifically, gang notions of manhood, their images of women, their language, and their survival strategies have been influential (Schärf, 1990). Although it was not possible to treat population group as a variable in this study, these influences are likely to have contributed to some of the findings.

Physical discipline

The family and school are crucial factors in the initial and ongoing socialisation of children. They play a prominent role in instilling and perpetuating attitudes towards discipline. A link has been demonstrated between physical aggression in the family and aggression and other crime outside the family context (Harbin and Madden, 1983; Hotaling *et al.*, 1989; Straus and Kantor, 1994). Furthermore, physical punishment at school has been associated with aggression against teachers and other students, and with vandalism involving school property (Orentlicher, 1992). By conveying the implicit message that physical aggression is an appropriate means of resolving conflict, physical punishment may promote adolescent aggression and destructive behaviour (Newell and Kibel, 1995).

Studies of corporal punishment at South African school indicate that caning and other forms of physical punishment occur indiscriminately in black and white schools throughout the country (Rakitzis, 1987; Davis, 1985; Rice, 1985; and Weiss, 1985, all cited in Holdstock, 1990). Furthermore, there is evidence from the Transvaal that the lifetime prevalence of corporal punishment for boys is 97% or higher among Afrikaans-speaking whites, English-speaking whites, and black students, and that black students are more likely to be beaten more frequently (Rakitzis, 1987; and Weiss, 1985, both cited in Holdstock, 1990). Conversely, the study by Rikitzis (1987, cited in Holdstock, 1990) indicated that black students were less likely to be physically punished at home; 41,2% of black students denied ever having been punished at home, compared to 8,4% of Afrikaans-speaking and 30,4% of English-speaking whit students.

One should be cautious in interpreting the results of the present study in the light of these findings. Not only were the above studies not conducted in the Western Cape where the trends may be different, but little information is provided about their methodology which makes it difficult to assess the validity of the findings (Holdstock, 1990). Also, in the present study, physical *injury* (as opposed to physical punishment *per se*) was assessed; indeed, in the questions regarding physical injury by a staff member at school, corporal punishment was specifically excluded. In the home context, corporal punishment was not excluded, but it is not known the extent to which corporal punishment at home may have been construed as physical injury.

These caveats notwithstanding, the prevalence data for corporal punishment cited above is partially consistent with the results of the present study. Xhosa-speakers were *less* likely to have been injured by a school staff member compared to those speaking other languages, which is not consistent with the finding that the lifetime prevalence of corporal punishment is comparable between whites and blacks. Also, the probability of being physically injured in the home setting was approximately the same for Xhosa-speakers as for those speaking other languages, which is not consistent with the finding that black students are less likely to have received physical punishment than those speaking other languages. Additional research is necessary to determine the extent to which these inconsistencies are due to the factors mentioned in the previous paragraph.

Media influences

There appears to be a developing consensus that exposure to television and film violence increases the prevalence of physical aggression among exposed children (Anonymous, 1985; Centerwall, 1992; Heath *et al.*, 1989). In South Africa the state-owned broadcasting media have had a monopoly on shaping public attitudes by determining programme content. It has been argued that levels of violence among whites in South Africa increased after television broadcasting was introduced in 1975 (Centerwall, 1992). Due to sharp economic disparities between the white and black population, access to television has been concentrated in the former group. As a result whites have been the prime target of media influences. The relatively low levels of violent behaviour

observed among Xhosa-speaking students in the present study may be partly accounted for by this trend.

Weapon carrying by adolescents is an area of increasing concern (Koop and Lundberg, 1992). United States data for 1986 indicate that 12% of all deaths among adolescents younger than 19 years were due to firearms (Mason and Proctor, 1992). South African data for 1988 show that gunshot wounds were the second largest cause of death of both suicide and homicide (Central Statistical Service, 1988a,b). As regards non-fatal injuries, data from the Trauma Unit at Groote Schuur Hospital for 1991 show that, of the 1 787 assault injuries treated, 1 080 and 123 were due to stab and gunshot wounds respectively (J. Knottenbelt, personal communication). For adolescents aged 10 to 19 years injured by violence in the Cape Metropole, 65,5% were injured by a sharp weapon but only 3,0% were injured by firearms (Van der Spuy, personal communication).

The present findings are consistent with these trends in that knives were the most common weapons carried at schools and guns were carried substantially less frequently. However, in South Africa as a whole there is increasing concern about the prevalence of firearm possession (Lerer and Hansson, 1993). In 1990, there were 2,8 million registered firearms in South Africa, the majority of which have been licensed in the last decade (Hoffmann and McKendrick, 1990). Effective gun control strategies are urgently required to abort a potential trend for school children to have access to weapons (Lerer and Hansson, 1993).

The results of the present study are consistent with the notion that victims of violence do not comprise a random sample of the population since identifiable risk factors are associated with physical assault. Among these risk factors are age, gender, race, social class, time of day, time of week,

physical setting, and alcohol use (Butchart *et al.*, 1991b; Hough and Mayhew, undated). Although a certain amount of intentional risk taking characterises the adolescent developmental stage, a proportion of adolescent risk behaviour may stem from ignorance of the risks (Shamsie, 1985). There are clearly risk associated with exposing oneself to potentially dangerous situations at night, for example hitchhiking at night. In addition, incidents of physical victimization in the school and home setting may be characterised by identifiable antecedents. Where such factors can be determined, educational programmes may prove useful in providing adolescents with information that may enable them to reduce their exposure to risk.

Other intervention strategies (some of which have been implied above) that may reduce the prevalence of violent behaviour among school students include (McKendrick and Hoffmann, 1990b):

- school-based programmes encouraging non-violent coping strategies and tolerance (Rosenberg *et al.*, 1992);

- education on the relationship between sex-role stereotyping and violence Flitcraft, 1992);

- prevention and treatment of associated psychiatric conditions such as alcohol abuse (Lerer, 1992);

- opposing the use of physical punishment in the school and home setting (Newell and Kibel, 1995);

- reducing the exposure of children and adolescents to violence in the media (Centerwall, 1992);

- revising firearm legislation and discouraging the carrying of weapons as a means of self-defence (Lerer and Hansson, 1993; Mahler and Fielding, 1977); and

- improved psychological management and treatment of adolescent assault victims and perpetrators (McKendrick and Hoffmann, 1990b).

It is however necessary to emphasize that preventive strategies are likely to be of limited efficacy in the absence of ongoing improvement in the socio-political scenario in South Africa (Knobel, 1986).

5.2.7 Sexual behaviour

a) Specific methodological considerations

As mentioned in the Methods chapter of this thesis, only a proportion of the respondents in schools administered by the House of Assembly (HoA) and House of Representatives (HoR) completed the full version of the questionnaire. The remaining students completed an abbreviated version in which questions involving sexual behaviour were omitted. Reasons for this were presented in some detail in the Chapters 3 and 4 above. In brief, data regarding sexual behaviour may not be available for one of the following reasons:

- permission was denied by the *school* for the items involving sexual behaviour to be included (two schools in the HoA);

- permission was denied by the *parent/guardian* for the student to complete the section involving sexual behaviour;
- even though permission was granted both by the school and the parent/guardian for the questions involving sexual behaviour to be included, this section was not completed by the student for one of the following reasons: (i) they chose not to, for example because of culturally-rooted taboos or concerns about privacy or anonymity; (ii) they unintentionally omitted to complete the first question involving sexual behaviour, which would result in their being regarded as not completing any items in that section; or (iii) owing to administrative problems students who had permission to complete the questionnaire did not receive the full version of the questionnaire including the questions on sexual behaviour.

Clearly, there is a strong possibility that the fact that only a proportion of the students completed the questions involving sexual behaviour introduced a source of bias. The students for whom data are available may differ systematically in terms of sexual practice from the rest of the sample; for example, it is possible that those for whom permission was denied are situated in a social environment that is less tolerant of sexual behaviour during adolescence. This difference could occur at any of the three levels at which permission was denied; in other words, the difference in tolerance could occur at the level of the schools, the parents/guardians, or students themselves. In addition, it is possible that there are differences in this regard between the education departments since their requirements in terms of consent were not uniform; at the extremes were the Department of Education and Training (DET) (which did not require any specific consent from the schools or parents/guardians) and the HoA (which required written permission from

the parent/guardian of each student that completed the full version of the questionnaire).

The extent to which this non-response bias could have influenced the results varied between education departments. The proportion of full versions of the questionnaire in relation to the total number of questionnaires were 100% for the DET (since only the full versions of the questionnaire were administered in this department), 39% for the HoA, and 96% for the HoR (Table 4.4). In addition, the extent to which this bias was operating varied according to the schools within the HoA and HoR. This was most apparent for the HoA; the potential for the non-response bias to influence the results was clearly greatest in those schools for which the school denied permission for any students to complete the questions dealing with sexual behaviour and least in the school where 95% of the students who participated provided data regarding their sexual behaviour (Table 4.4).

b) Comparison with previous studies

There are no data from previous studies with which the findings from the present study can be compared regarding whether the partner was known for more than seven days, the number of weeks since the last coital episode, and heterosexual and (for males) homosexual anal intercourse.

Lifetime prevalence of sexual intercourse

The two international studies that received attention in the Literature Review chapter of this thesis were the Canada Youth and AIDS study (King *et al.*, 1989, 1990) and the YRBS study carried out in the USA (Kann *et al.*, 1993). The overall prevalence of having participated in sexual intercourse in the present study appears to be somewhat lower than those reported in Canada and the USA. In the former country, 49% of the males and 46% of the females had experienced sexual intercourse on one or more occasions by the time they were in Grade 11 (which is equivalent to Standard 9). In the latter country, 57,4% of the males across all standards and 50,8% of the females across all standards were non-virgins. In Grade 12 (which is equivalent to Standard 10), 66,7% had ever experienced sexual intercourse, compared to 21,6% of the boys and 25,0% of the girls in Standard 10 in the present study.

As mentioned above, there were large differences between the language groups in the percentage of students who had ever experienced sexual intercourse. The percentage of Xhosa-speaking students who had ever participated in sexual intercourse appeared to be higher than the overall prevalence in the USA and (possibly) Canada. However, when comparing Xhosa-speaking students in the Cape Peninsula to Black students in the USA, the proportions are lower in the Cape Peninsula.

Why should the proportion of students who have participated in sexual intercourse be lower in the Cape Peninsula compared to Canada and the USA? It is unlikely to be ascribable to the non-response bias mentioned above since one would expect this bias to operate in the opposite direction. A more plausible explanation is that adolescent sexuality is less proscribed in North America compared to South Africa (Brooks-Gunn and Furstenberg, 1989; Foster, 1986). This would affect not only the "true" prevalence of having experienced sexual intercourse, but also the validity of the responses to the questionnaire. Additional studies are required to elucidate this issue.

Comparisons with previous South African studies are complicated by the wide range of prevalences reported. Of the studies with samples consisting of school students, the lifetime prevalence of sexual intercourse for students in Standard 9 in the present study was lower than that for males (27,0% vs. 48%) but higher than that for females (18,6% vs. 4%) in Amod and Shmukler's (1985) sample of Indian students in Standard 9 at Johannesburg schools. The prevalence in the present study was lower than that for high-school dropouts in a working class Coloured community in the Cape Peninsula for both boys and girls (Flisher and Chalton, 1995). The lifetime prevalence of intercourse for students of all language groups in the present study was *lower* than that for male (Kau, 1991) and female (Kau, 1988) black students in Bophuthatswana and a previous study conducted in black high schools in Cape Town (Mathews *et al.*, 1990). However, the lifetime prevalence of sexual intercourse for *Xhosa-speaking* students in the Cape Peninsula was *higher* than that for males and females in Bophuthatswana (Kau, 1988, 1991) but still lower than that for male

high-school students the study of Mathews *et al.* (1990) conducted in the Cape Peninsula. It is difficult to draw any specific conclusions regarding the findings for females in the present study compared to that of Mathews *et al.* (1990) since the prevalence for Xhosa-speaking girls in the present study (60,8%) lay between that for females aged less than 18 years (54%) and 18 years or above (91%) in the study by Mathews *et al.* (1990).

Many of these discrepancies are explicable by obvious differences in the demographic profiles of the samples. Although there are no obvious differences between the sample of Mathews *et al.* (1990) and the present study that would explain the discrepant findings for males, the manners in which the questions were asked could be relevant in this regard. In the present study, the students were asked if they had ever had heterosexual vaginal intercourse, and this was defined explicitly in anatomical terms. In the study by Mathews *et al.* (1990), the students were asked if they had been sexually active. As Mathews *et al.* (1990, p 515) state:

> *The students' interpretation of what constitutes sexual activity was not elicited. It is impossible to ascertain whether they reported on penetrative sexual intercourse or other sexual activities which place them at low risk.*

It is thus possible that the students in the study of Mathews *et al.* (1990) who indicated that they had been sexually active were defining this activity considerably more broadly than intended by the relatively restrictive definition supplied in the present study. This could have resulted in the higher prevalence obtained for the boys in the study of Mathews *et al.* (1990).

Age at first coitus

Age at first coitus was not included in the international studies cited in the Literature Review. It is difficult to compare the findings from the present study with those of previous South African studies (Table 2.35) owing to differences in the way in which the variables were defined. This factor notwithstanding, it would appear that the median ages of first intercourse of 14,9 years for boys and 15,6 years for girls are compatible with the median age of first intercourse of:

- 15 years for pregnant black females attending two Port Elizabeth hospitals (Boult and Cunningham, 1991);
- 15 years for both boys and girls attending a private high school in Cape Town (Disler, 1990)
- 15 years for boys and 16 years for girls in Bophuthatswana (Kau, 1988, 1991); and
- 17 - 19 years for sexually active girls attending a family planning clinic in Cape Town (Van Coeverden de Groot and Greathead, 1987).

In addition, the present findings do not contradict Amod and Shmukler's (1985) finding that, for those who had experienced sexual intercourse, 81% of the males and 75% of the females had their first coital episode by the age of 16 years.

The consensus from the previous South African studies that the median age of commencing intercourse is in mid-adolescence implies that prevention programmes should prioritise youth in *early* adolescence.

Number of sexual partners

There were no items regarding the number of sexual partners in the international studies reviewed in Chapter 2 of this thesis (Kann *et al.*, 1993; King *et al.*, 1988, 1989). As with age of first intercourse, comparisons of the present results with those of previous studies conducted in South Africa are impeded by differences in the definitions of the variables. For example, in the study by Amod and Shmukler (1985), it is not possible to distinguish those who have had two partners from those who have had more than two partners. One can conclude from the present study, in which the median number of partners in the previous 12 months was 1,5 for males and 1,0 for females, that having multiple partners does not constitute the norm. This conclusion is compatible with:

- 65,5% of black teenage girls attending Port Elizabeth hospitals having only one partner in their lifetime (Boult and Cunningham, 1991);

- 74% of University of the Witwatersrand students who had experienced sexual intercourse in the previous six

months having done so with one partner only (Friedland *et al.*, 1991); and

- 88,1% of black Bophuthatswana adolescents having only one "current partner" (Kau, 1988).

Although it is reassuring that the majority of sexually active adolescents in South African studies do not appear to have many partners, one should bear in mind that reporting the data in terms of the number of adolescents who have had one partner only in a selected time period does not convey any information about the number of partners of those who had more than one partner. A similar consideration applies to the present study in which the data are reported in the form of the median value, which is insensitive to the values of the extreme scores in a distribution (Kachigan, 1986). Not only may adolescents with several partners be exposing themselves to risk of the adverse consequences of sexual activity, but they may be exposing their partners in this manner. Thus, even among adolescents who have had only one sexual partner, some may be at risk though the promiscuous activities of their partner(s).

Use of contraceptives

Detailed data are available from the YRBS study carried out in the USA (Kann *et al.*, 1993) regarding contraceptive use. It was found that for sexually active students 83,0% of the males and 80,8% of the females had used a contraceptive method on the most recent coital episode. This is higher than the percentage of 60,5% of

students who had experienced sexual intercourse in the present study who did something to prevent pregnancy on their last coital episode.

There is considerable concern about the number of American teenagers who are exposing themselves to risk of pregnancy and sexually transmitted infections (Huizinga *et al.*, 1993). In the light of the lower percentages of youth in the Cape Peninsula who are using contraceptives, such concern should be amplified in this context. Why should the proportion of students in the Cape Peninsula who fail to take measures to prevent pregnancy be higher in the Cape Peninsula than in the USA? First, adolescents in the USA are exposed to a greater extent to health promotion interventions, and the effects of this may be manifest in their behaviour (Dryfoos, 1990; Flisher and Reddy, 1995). Second, societal attitudes to sexual behaviour of adolescents in the USA may be more conducive to their being able to take steps to prevent pregnancy (Thinane, 1980, cited in Amod and Shmukler, 1985).

The only previous study conducted in South Africa that inquired about contraceptive use on the last occasion that sexual intercourse took place was among high-school dropouts in the Cape Peninsula (Table 2.35)(Flisher and Chalton, 1995). They found that 64,8% of the males and 49,7% of the females had done something to prevent pregnancy on this occasion. The 95% confidence intervals for these intervals were wide, and the prevalence of 60,5% obtained in the present study was within the bounds of these confidence intervals. Roberts (undated) found that 55% of her sample of attenders at a family planning "always used contraception". It might appear anomalous that a lower percentage

reported contraceptive use in her study compared to the present study; however, her criterion was more strict since a proportion of those who used contraception on their last coital episode in all likelihood do not always use contraception.

Only two other studies inquired about contraceptive use by school students. Kau (1988) reported that 30,7% of her sample of female high school students in Bophuthatswana use contraception regularly, while Disler (1990) reported that 41% and 24,3% of her sample of students attending a private high school in Cape Town always and sometimes use contraceptives respectively. It would appear that the students comprising the present sample are more likely to use contraceptives than those comprising the samples of Kau (1988) and Disler (1990). However, in the present study the students were asked whether they "did or used anything to prevent pregnancy" whereas in these other studies they were asked whether they had used contraception. It is possible that the students interpreted the term "contraception" in a narrower sense than the concept of doing or using anything to prevent pregnancy. Withdrawal, the rhythm method, or even the use of injectable steroids may not have been included in the term "contraception" but would have been regarded as doing or using something to prevent pregnancy. Further investigation would be necessary to clarify this issue.

Two of the previous studies conducted in South Africa inquired specifically about condom use. Friedland *et al.* (1991) reported that 26% of the sexually active students in his sample at the University of the Witwatersrand had used a condom in the previous six months. Mathews *et al.* (1990) found that 11,4% of their

sample of students attending DET high schools had ever used a condom. There is no way of knowing whether those who denied using a condom had used any other contraceptive methods. However, given the finding in the present study that 75,5% of the Xhosa-speaking students who used a method of contraception used injectable steroids, it is probable that many of the students in the sample of Mathews *et al.* (1990) were using other methods.

The finding in both the international and South African studies that large numbers of adolescents do not take adequate measures to protect themselves against pregnancy and sexually transmitted infections may partly reflect a lack of knowledge (Morrison, 1985). However, a low prevalence of contraception usage has been reported in adolescents who are knowledgeable in this regard (Brooks-Gunn and Furstenberg, 1989; Preston-Whyte and Zondi, 1991; Schopper, 1990) and have access to contraceptive services (Friedland *et al.*, 1991). It is possible that some adolescents perceive themselves to be at low risk (King *et al.*, 1989) and invulnerable to the dangers of unsafe sex (Hein, 1989). Alternatively, unsafe sexual practices may reflect a need to engage in risk taking behaviour or an unconscious wish to become pregnant (King *et al.*, 1989; Nash, 1990; Sankar and Abdool Karim, 1991; Friedland *et al.*, 1991).

The above factors are applicable to adolescents in general. In addition, previous studies have addressed the reasons for not using condoms among samples of South African adolescents. In a qualitative study carried out among about 650 black students in Standards 9 and 20 at four high-schools in Durban, S.S. Abdool

Karim *et al.* (1992) found that the following factors were operative in this regard:

- ignorance about key aspects of condom use, for example the purpose of the 'pouch at the tip' and the consequences of a condom slipping off and being left in the vagina (which was thought to be able to cause death);

- lack of anticipation of the possibility of sexual intercourse taking place, resulting in condoms not being available;

- concerns about reduction of pleasure;

- the use of condoms was perceived to be incompatible with notions of 'manhood';

- the association of condoms with casual sex, resulting in condom use being perceived to indicate lack of trust;

- a reluctance to use condoms because of their contraceptive effect;

- condoms being associated with sexually transmitted infections, resulting in their use being perceived to indicate the presence of such infection;

- difficulties in acquiring condoms.

This final factor has been addressed in another study carried out in another qualitative study carried out in Durban (Q. Abdool Karim *et al.*, 1992a,b). Randomly selected family planning clinics were visited by teenage fieldworkers who posed as "patients" seeking condoms. It was found that not all the clinics were easy to locate and some of the fieldworkers were embarrassed by security personnel. Condoms were not always available, and when they were available they were distributed in a setting that lacked privacy. Information on AIDS was rarely offered, and a packet of less than ten condoms was provided on each occasion. It was concluded that it was difficult for teenagers to obtain condoms at family planning services in Durban.

Although the above two studies were carried out in Durban, it is possible that some of the factors identified may also pertain to the Cape Peninsula and thus be relevant in explaining the findings regarding the low prevalence of contraceptive use in general and condom use in particular. However, in the study among black township school students by Mathews *et al.* (1990), similar factors were identified. Another study conducted in the Cape Peninsula indicates the extent of missed opportunities for contraception counselling (including regarding condom use) occurring at primary health care level. Flisher *et al.* (1992) conducted exit interviews with 225 youth attending day hospitals in the Cape Peninsula. They found that 44% of their sample did not receive contraception intervention at that visit to the day hospital but would have liked to do so.

Lifetime prevalence of sexual intercourse

In the present study, there was a trend for males to be more likely than females to have experienced sexual intercourse, except for those in Standard 10. In the Canada Youth and AIDS study (King *et al.*, 1988, 1989) males in grades 9 and 10 were more likely to have experienced sexual intercourse "once" and "a few times", and males in Grade 9 were more likely than females to have participated in sexual intercourse "often". However, for Grade 11, the converse trend was present. Although the differences were small and may not be statistically significant, it is noteworthy that in both the present study and the Canada Youth and AIDS study (King *et al.*, 1988, 1989) the higher risk to which boys were exposed relative to the girls was not preserved in the more senior classes. In the YRBS study carried out in the USA (Kann *et al.*, 1993) there was a trend for males to be more likely than females to have experienced sexual intercourse. There are no data regarding whether this trend was manifest for all standards.

So far as previous South African studies are concerned, the finding that males are more likely than females to have experienced sexual intercourse is compatible with the data from the studies by Amod and Shmukler (1985), Disler (1990), Firedland *et al.* (1991), Kau (1988, 1989) and (for those less than 18 years of age) Mathews *et al.* (1990). In the study by Mathews *et al.* (1990), for those less than 18 years of age, 86% of the males and 54% of the females had ever had coitus. However, for those aged 18 years or above,

the percentages for males and females were 92% and 91% respectively. The trend observed in the present study and the Canada Youth and AIDS study for the trend for males to be more likely to have experienced sexual intercourse than females to disappear for older adolescents is thus also observed in the study by Mathews *et al.* (1990).

Use of contraceptives

In the present study, with the exception of those in Standard 6, there was a trend for the percentage of students who had used or done something to prevent pregnancy to be higher for females. This trend was particularly conspicuous for Xhosa-speaking students; 23,6% of the boys and 73,3% of the females had taken steps to prevent pregnancy. However, for Xhosa-speaking students the percentage who had used injectable steroids for contraceptive purposes was considerably higher than in the other language groups. It is thus possible that many of the Xhosa-speaking boys were in fact protected from causing pregnancy of their partners, even though they did not realise it. (The question referred to whether the respondent or their partner had done or used anything to prevent pregnancy, so the boys would have responded affirmatively to the question if they were aware that their partners were taking injectable contraceptive steroids.)

Is this trend present in the YRBS study conducted among high-school students in the USA? The answer to this question is negative. There was no significant difference between the proportions of boys and girls who had used a contraceptive method

on the last coital episode. However, males were significantly *more* likely to have used a condom on their last coital episode than females (54,6% vs. 38,0%). Additional investigation is necessary to explain this difference in the gender trends between the USA and the Cape Peninsula.

School standard

Lifetime prevalence of sexual intercourse

The only consistent trend according to school standard unearthed in the present study was the increase in the proportion of girls who has participated in sexual intercourse. For boys, there was an increase up to Standard 9. In the Canada Youth and Aids Study (King *et al.*, 1988, 1989), there was an increase for boys and girls in the proportion of students who had experienced sexual intercourse "a few times" and "often" between grades 9 and 11. In the YRBS study conducted in the USA (Kann *et al.*, 1993), there was a statistically significant increase in the prevalence of ever having had sexual intercourse with school grade. In the two South African studies in which the relationship of ever having had sexual intercourse and age was examined, the same trend was observed.

Of course, it is to be expected that the prevalence of having had sexual intercourse would increase with age. The only circumstances where this would not apply are:

- if having intercourse is a risk factor for dropping out of school and the magnitude of this effect is sufficiently

large for it to be reflected in the trends according to school standard; and

- there is a "critical period" in which adolescents are particularly likely to commence intercourse - however, there is no evidence that such a "critical period" exists.

Use of contraceptives

In the YRBS study (Kann *et al.*, 1993), the percentage of students who used any contraceptive increased significantly with increasing grade. In the only previous South African study in which contraceptive use was examined in relation to age, Disler (1990) found that there was a trend for the younger sexually active girls attending a private school in Cape Town to be less likely to use contraceptives. For boys, there were no detectable trends according to school standard. In the present study, there were no obvious trends for this item. However, girls in Standard 6 may be less likely to do something to prevent pregnancy than those in Standard 7.

It is unclear why the trend in the USA for the prevalence of contraceptive use to increase with grade was not observed in the present study (the findings for girls in Standard 6 notwithstanding). Presumably it can be ascribed partly to the relative absence in South Africa of preventive efforts, especially those directed at sexually active adolescents.

Lifetime prevalence of sexual intercourse

The relationship between home language and lifetime prevalence of sexual intercourse has been partly addressed in the section dealing with overall trends above. It was mentioned that the trend for the lifetime prevalence of sexual intercourse to be higher for Xhosa-speaking students is consistent with the trend in the USA for the prevalence to be significantly higher among black students than white or Hispanic students (Kann *et al.*, 1993). There were no previous studies conducted in South Africa involving adolescents from diverse language groups, which makes it impossible to extract trends from *within* studies. However, as mentioned in the Literature Review, one can extract trends *between* studies, which provides less reliable conclusions. Notwithstanding this, it would appear that there is a trend for the for the lifetime prevalence of sexual intercourse to be higher for black students than for Asian and white students. There is thus a substantial consistency between the results of he present study and that of previous studies both in the USA and South Africa regarding the trend for black students to be more likely to have experienced sexual intercourse.

There are no scientific data that cast light on the reasons for this state of affairs. It is possible that cultural, social, and economic factors are contributory. Some writers have suggested that the process of urbanisation may be partly responsible. Preston-Whyte (1991) has written that the housing shortages and co-educational

education associated with urbanisation result in increased opportunities for interaction between adolescents in urban areas, and this in turn allows for peer pressure to exert an influence on sexual behaviour. Kau (1991) intimates that many aspects of sexual behaviour of black youth can be partly ascribed to the traditional institutions (such as initiation schools) that tended to reduce this behaviour not having been replaced by suitable alternatives in the urban context. However, these comments do not appear to be based on empirical data, and further research is necessary to fill this gap in the literature.

Use of contraceptives

Clear and consistent trends according to home language were not apparent in the present study. Boys speaking Afrikaans or Xhosa at home appeared less likely to use contraceptives. There were no detectable trends for girls.

In the YRBS study (Kann *et al.*, 1993), black and Hispanic students were significantly less likely to have used a contraceptive method during their most recent coital episode. It is not possible to extract trends from the previous South African studies; not only are there no previous South African studies in which data are provided separately for different language or population groups, but comparisons between studies are not valid owing to key differences in other aspects of the sampling frame or the manner in which questions regarding contraception are framed.

In the section dealing with general trends above, various postulated reasons for not using contraceptives in general or condoms in particular were provided. These reasons may be particularly relevant to boys speaking Afrikaans or Xhosa at home since their prevalence of contraceptive use was lower than for boys speaking other languages. Furthermore, of those who did use contraception, a relatively smaller percentage of Xhosa-speaking students used condoms compared to students speaking other languages. On the other hand, the extent of injectable contraceptive use by Xhosa-speaking students was relatively large. This may partly account for the large difference in the prevalence of contraceptive use between Xhosa-speaking males and females. It is the experience of this candidate that the staff at community clinics serving Xhosa-speaking youth in the Cape Peninsula actively promote the use of injectable forms of contraception (which would result in a lower proportion of students using condoms). While the above findings testify to the success of this effort, it may have resulted in the neglect of condom promotion.

c) General comments

Only selected items involving sexual behaviour were discussed in the section above involving trends and comparisons with previous studies. Other items were omitted since they have not been included in previous projects. However, it is apparent form both the items that were discussed and those omitted that there is a tendency for males and Xhosa-speaking students to be at greater risk for the adverse consequences of sexual activity. Clearly, prevention efforts need to prioritise these subgroups.

There was a low prevalence of heterosexual anal intercourse both among boys and girls and of homosexual anal intercourse among boys. The latter finding is consistent with the conclusion from previous observations in developing countries that the main threat of HIV infection is from heterosexual encounters (Piot and Caraël, 1988; Ulin, 1992).

Age at first intercourse may be a poor indicator of risk owing to the possibilities of a long time interval between the first and subsequent sexual encounters and a relative infrequency of sexual encounters soon after the commencement of sexual activity (Brooks-Gunn and Furstenberg, 1989). However, it may be associated with a higher incidence of obstetrical complications, sexually transmitted infections, unwanted pregnancies, adverse emotional consequences, and socio-economic deprivation (Van Coeverden de Groot and Greathead, 1991). The findings mentioned above that a considerable proportion of adolescents are commencing sexual activity at a relatively early age, and furthermore that many of these younger students have not known their partner for more than 7 days and are not taking adequate precautions against pregnancy and sexually transmitted infections, implies that education regarding sexuality should commence in primary school (Van Coeverden de Groot and Greathead, 1991). Furthermore, the HIV epidemic has emphasised the urgency of introducing comprehensive and effective sexuality education in South African schools.

At present, there are a limited number of programmes including sexuality education being offered in South African schools (Cilliers, 1989). The Department of National Health and Population Development has developed an "Aids and Lifestyle Education Programme", which includes posters, a video, and a number of educational modules (Reddy *et al.*, 1992). The House of Representatives, which is one of the departments in

which the present study was conducted, offers a family guidance programme (Groenewald, 1994). The 1987 pilot project for this programme was evaluated by the HSRC before the full programme was implemented in 1 050 schools. The programme is offered for one period per week to students from Sub A to Standard 10. The aims of the programme are (Groenewald, 1994):

- to guide students to make responsible decisions;
- to develop self-esteem and assertiveness;
- to promote positive relationships;
- to prevent pregnancy and sexually transmitted infections; and
- to identify and refer youth who have been abused.

In addition, there have been some pilot projects that have been evaluated. Kuhn *et al.* (1994) developed and evaluated an AIDS education programme in a high-school in a socio-economically disadvantaged African township in Cape Town. By drawing on comparisons with a control school, they found that the programme greatly improved students knowledge of HIV transmission and prevention and increased levels of acceptance of people with AIDS. However, it had only a small impact on behavioural intentions. Mitchell (1994) designed and implemented a ten-hour AIDS prevention programme at a private boys' high school in Cape Town. She also had control groups, consisting of a life-styles (placebo) programme. She also found that the programme had the beneficial effects noted by Kuhn *et al.* (1994), but these effects were not preserved at follow-up. This indicates the necessity of conducting follow-up

assessments, and of considering "booster" sessions after the termination of the intervention. Finally, a photo-comic developed for South African youth was developed and evaluated among school students using both qualitative and quantitative methodologies. The photo-comic was well-received by the youth and precipitated positive shifts in attitude and knowledge levels (Reddy *et al.*, 1994).

In conclusion, there are currently some large-scale programmes that have not been evaluated and some pilot projects that have. The results of the evaluations of the pilot projects indicate that efforts to reduce the adverse consequences of adolescent sexuality can be effective in the South African context. Efforts are underway to ensure that all South African adolescents are exposed to programmes that aim to reduce the prevalence of unsafe sexual practices (Lazarus, 1994; NACOSA, 1994). Such efforts would need to take as a point of departure the finding from the present study that a considerable proportion of Cape Peninsula adolescents are currently at risk for the adverse consequences of sexual activity.

5.3 INTERRELATIONSHIPS BETWEEN RISK BEHAVIOURS

5.3.1 Evidence for the syndrome of adolescent risk behaviour

This section will consist of a discussion of the results for Objective 2, which was to investigate whether the notion of a syndrome of adolescent risk behaviour is valid for high-school students in the Cape Peninsula and to investigate whether suicidal behaviour and behaviour exposing oneself to injury should be included in this syndrome.

The odds ratios for the relationships between all possible pairs of risk behaviours were greater than 1, which indicates that there is a trend for all the behaviours to be related to each other. There were statistically significant odds ratios between all possible pairs of behaviours that were also in the "original" syndrome of adolescent risk behaviour as described by Jessor and Jessor (1977). However, it should be borne in mind that the definitions of the behaviours were not identical to those in the study by Jessor and Jessor (1977). This was most obvious in the case of general deviance; Jessor and Jessor (1977) defined this in terms of frequency of illegal or antinormative activities such as lying, cheating, stealing, aggression, and vandalism whereas in the present study it was defined purely in terms of carrying a knife to school to be used as a weapon in the previous four weeks. Furthermore, there was no variable corresponding to general deviance for girls, and drinking (as opposed to problem drinking) and being an activist were not included for either gender in the present study.

It was mentioned in the Literature Review that cigarette smoking was included in the syndrome from an early stage (Jessor *et al.*, 1980; Rachal *et al.*, 1980, cited in Jessor, 1987). In the present study, the odds ratios for the relationships between cigarette smoking and the behaviours included in the original syndrome of Jessor and Jessor (1977) were all significantly greater than 1 except for cigarette smoking and having had sexual intercourse for girls for which the odds ratio was 1,1 (95% CI: 0,9 - 1,4). Other than the possibility that this result could be attributed to random sampling variation, there is no obvious explanation for this relationship failing to attain significance. However, it is noteworthy that it is having had sexual intercourse, as opposed to any of the other behaviours, for which a significant relationship with cigarette smoking was not demonstrated since there is evidence that for specific sub-groups having had sexual intercourse does not comprise a component of the syndrome of adolescent risk behaviour (Costa *et al.*, 1995; Stanton *et al.*, 1993).

The relationship between cigarette smoking and sexual intercourse notwithstanding, the results of the present study provide the first empirical support for the existence of a syndrome of adolescent risk behaviour among Cape Peninsula high-school students.

The remaining sets of relationships between the risk behaviours address the issue of whether the boundaries of the syndrome should be extended to include suicidal behaviour as well as behaviour exposing oneself to risk of both unintentional and intentional injury. Suicidal behaviour was defined as attempting suicide in the previous 12 months, behaviour exposing oneself to risk of unintentional injury was defined by not using a seat belt on the last occasion when travelling in the front passenger seat of a motor vehicle, and behaviour exposing oneself to risk of intentional

injury was defined by going out at night beyond the neighbourhood and walking home alone during the previous four weeks.

It was found that there were statistically significant relationships between all possible pairs of behaviours comprising the "original" syndrome of adolescent risk behaviour as well as cigarette smoking, suicidal behaviour, and behaviour exposing oneself to risk of unintentional and intentional injury, *except* for behaviour exposing oneself to risk on unintentional injury and certain other behaviours (Tables 4.48 and 4.49). Specifically, the odds ratios were not significantly greater than 1 for failure to use a seat belt and the following behaviours:

- attempting suicide in the previous 12 months for boys and girls;
- ever having had sexual intercourse for girls; and
- going out at night and walking home alone during the previous four weeks for girls.

However, the odds ratios for all these pairs of behaviours were greater than 1, although not significantly so ($p < 0,05$). This indicates that there is a trend for the behaviours to be related to each other. Furthermore, for the three exceptions enumerated above involving girls, the lower bound of the 95% confidence interval was = 1,0, indicating a probability level of $p = 0,05$.

With these caveats in mind, it would appear that the results do support extending the boundary of the syndrome to include suicidal behaviour and behaviour exposing oneself to risk of unintentional and intentional injury.

As regards suicidal behaviour, there are no previous published studies documenting significant relationships between suicidal behaviour and all of the component of the original syndrome of Jessor and Jessor (1977), as well as cigarette smoking and behaviour exposing oneself to risk of physical injury. Previous studies in which this issue was addressed (Table 2.38) included only a subset of these behaviours. Furthermore, with the exception of the study by Choquet and Menke (1989) which was carried out in France, all the relevant previous studies were carried out in the USA.

As mentioned in Section 2.3.2, the inclusion of suicide attempts in the syndrome of adolescent risk behaviour is directly relevant for suicide prevention efforts. One could use other components of the syndrome of adolescent risk behaviour to screen adolescents at risk for suicide so that preventative interventions can be offered to those found to be at risk. Other screening criteria could include depression, male gender, and previous suicide attempts (Shaffer and Flisher, unpublished document; Shaffer *et al.*, in press). Adequate sensitivity, specificity, and predictive validity would need to be established before such a screening programme could be implemented.

There are fewer studies in which the relationships between behaviour exposing oneself to risk of physical injury and other adolescent risk behaviours have been examined (Table 2.39). As mentioned in the Literature Review, the few studies that do exist were all conducted in the USA and they have focused on only two of the behaviours comprising the syndrome of adolescent risk behaviour. The present findings are thus the most convincing so far that the syndrome of adolescent risk behaviour should be broadened to include behaviour exposing oneself to risk of

unintentional and intentional injury. However, it is necessary to emphasise that these results require replication in other samples.

The confirmation that the syndrome of adolescent risk behaviour is valid for high-school students in the Cape Peninsula provides support for a *lifestyles* approach to adolescent risk behaviour (Bussing *et al.*, 1994; Hurrelmann, 1990). According to this approach, specific behaviours are embedded in general styles of adaptation which are maintained by complex networks of social and cultural reinforcement (Kraft, 1991; Nutbeam *et al.*, 1989). The utility of this approach is that it directs attention to the adolescent as a whole rather than to individual risk behaviours (Jessor, 1991). The implication in terms of intervention is that programmes should attempt to influence the lifestyle of which the risk behaviours comprise a part as opposed to focusing on specific behaviours (Bussing *et al.*, 1994; Dryfoos, 1994).

This study did not address the *reasons* for the covariation of risk behaviour. The following possibilities have been suggested:

- they may share common aetiologies, for example a high level of sensation seeking (Zuckerman, 1971);

- they may reflect interchangeable means of achieving the same social goals, for example gain admission to a peer group (Huba *et al.*, 1980);

- they may be related through intervening variables, for example, alcohol bingeing resulting in an increase in impulsivity which removes inhibitions usually preventing unsafe sexual behaviour (Leigh and Stall, in press); and

- they may occur together in the social ecology of adolescence, which is characterised by organised opportunities to learn risk behaviours together as well as expectations that they will be performed together (Jessor, 1991).

These possibilities need to be explored in projects designed specifically to elucidate this issue. It is probable that the explanations for the covariation are a function both of the characteristics of the individual adolescent and the specific risk behaviours involved. It is also probable that the significant relationships between some specific pairs of risk behaviour can be ascribed both to their comprising aspects of the syndrome of adolescent risk behaviour as well as to their being related through another mechanism. This is exemplified by binge drinking and unsafe sexual behaviour; a significant relationship between these two behaviours may reflect their both being manifestations of the syndrome of adolescent risk behaviour as well as an additional mechanism applicable to this pair of behaviours (for example, disinhibition resulting from alcohol consumption leading to unsafe sexual behaviours). This question will receive further attention in the section below in which *multivariable* relationships between pairs of behaviours will be described.

5.3.2 Multivariate relationships among behaviours

This section addresses Objective 3 of the study, which was to investigate the relationships between the risk behaviours, taking onto account their influence upon one another.

In addressing Objective 2, it was shown that the notion of a syndrome of adolescent risk behaviour is valid for high-school students in the Cape Peninsula. This conclusion was based on significant bivariate relationships between several risk behaviours. Although these bivariate relationships are sufficient to justify this conclusion, they do not take into account the influence of other risk behaviours on the relationships between pairs of behaviours. Such a multivariate approach is necessary since the implications of a significant pairwise relationship are partly determined by whether it is sufficiently robust to be preserved once the influence of other risk behaviours is taken into account.

In this multivariate analysis, there were several risk behaviours for one or both genders that qualified for inclusion in the logistic regression model, despite the fact that there was a strict entrance criterion. There are thus significant relationships between many adolescent risk behaviours *even when* the influence of other risk behaviours is accounted for.

Furthermore, except for one relationship, the odds ratios were greater than 1. Those who engage in the behaviour denoted by a dependent variable are thus *more* likely to engage in the behaviours denoted by the independent variables qualifying for inclusion in the relevant model.

However, there were several significant results in the bivariate analysis that were *not* preserved once the influence of other risk behaviours had been accounted for. This is particularly obvious for the variable of having made a suicide attempt in the previous 12 months; for each gender, this was significantly related to all except one of the other seven variables in the bivariate analysis. However, in the multivariate analysis, having attempted suicide in the previous 12 months was predicted by only one risk behaviour for one gender.

Among the possible explanations for significant results in the bivariate analysis not been preserved in the multivariate models are the following (Gillmore *et al.*, 1992).

- The relationships between two risk behaviours may be caused by another risk behaviour. Thus, alcohol use may predispose to both cannabis use and suicide attempts; by controlling for alcohol bingeing, the significant univariate relationship between cannabis use and having made a suicide attempt is no longer preserved.

- Two risk behaviour that are significantly related in the bivariate analysis may be related by means of one of the other risk behaviours serving as an intervening variable. Thus, for girls, having five or more drinks on one occasion may result in going out at night and going out at night beyond the neighbourhood and hitchhiking home which may in turn result in sexual intercourse (consensual or otherwise). Controlling for the intervening variable, which in this example involves hitchhiking home, could result in the significant univariate relationship between alcohol consumption and having had sexual intercourse not being preserved.

- It was argued that adolescent risk behaviours are manifestations of an underlying syndrome of adolescent risk behaviour. One would thus expect that some of the significant bivariate relationships would no longer be significant when the other variables are controlled (as occurs in multivariate logistic regression analyses) since they are all manifestations of the

same phenomenon. The relationships that are preserved are not merely substitutes for each other as manifestations of the syndrome of adolescent risk behaviour.

Additional analyses would be necessary to determine the extent to which each of the above explanations are applicable. It is probable that different explanations are applicable to different combinations of risk behaviour.

Some of the relationships that are significant in the logistic regression models were listed as "specific findings" in the Results chapter of this thesis.

Specific finding #1

There is a substantial association between many forms of substance abuse; for example, male and female students who smoke cigarettes are more likely to have ever smoked cannabis and to have had an alcohol binge in the previous fortnight than those who do not smoke cigarettes.

The association between many of the forms of substance use is a robust finding in the field of adolescent risk behaviour (Kandel, 1980). Kandel's theory of adolescent substance use posits that individuals progress from licit to illicit substances and then to progressively "harder" drugs (Kandel 1975b; Single *et al.*, 1974). Substances used in an earlier stage are carried over into later stages, giving rise to the phenomenon of multiple drug use. This theory has been validated by longitudinal studies and appears to hold across

a variety of demographic groups and geographical settings (Bailey, 1989).

The present data are not longitudinal. However, the results for boys are consistent with Kandel's theory in that the number of substances qualifying for inclusion in the model increases as one moves from the dependent variable of cigarette smoking, to that of alcohol bingeing, to that of cannabis use.

Specific finding #2

The model for the dependent variable of attempting suicide in the previous 12 months did ***not*** *include the variables involving cigarette smoking, illicit substance use, alcohol bingeing, and (with the exception of physically injuring somebody outside of home or school in the previous 12 months) violent behaviour.*

It is inconsistent with previous findings that the model for the dependent variable of attempting suicide in the previous 12 months did **not** include the variables listed above (Berman and Schwartz, 1990; Cairns et al., 1988; Crumley, 1990; Garrison *et al.*, 1993; Shaffer, 1974; Walter et al., 1995). However, the relevant odds ratios in the bivariate analysis were significant, and the variable involving suicidal behaviour did qualify for inclusion in the model for the dependent variable of cigarette smoking. Possible reasons for the inconsistency with previous findings could include:

- the findings from other continents may not be applicable to South African samples;

- the variables were defined differently;

- less strict levels of significance were used; and

- some of the studies did not employ multivariate analyses and, where multivariate analyses were employed, the range and nature of the additional variables were different from those for the present study.

Further investigation is necessary to explain this inconsistency between the results from the present study and those of previous studies.

Specific finding #3

Seriously thinking about self harm in a way which might result in death or telling anyone of an intention to take one's life in the previous 12 months were significant correlates of a suicide attempt in the same time period.

This potential of screening programmes to identify adolescents at risk for suicide was mentioned in Sections 2.3.1 and 5.3.1 above. This specific finding confirms the possibility of using suicidal ideation and the communication of suicidal intent for case-finding purposes.

The odds ratios for seriously thinking about self harm in a way which might result in death were *higher* than those for telling anyone of an intention of ending one's life. For the former item the adjusted odds ratios were 10,7 and 16,0 for boys and girls respectively, while for the latter they were 4,3 and 2,7 for boys and girls respectively. The 95% confidence intervals overlapped for boys but not for girls. In attempting to explain a similar finding in a sample of Australian school students, Pearce and Martin (1994) argued that those who communicate suicidal intent fall into two subgroups:

- those who in fact do intend to make a suicide attempt; and

- those who choose threats as an alternative to a suicide attempt to communicate their strife and need for help.

Although intervention for the former group can be life-saving, the latter group also require assistance to enable them to deal with their stressors.

Specific finding #4

Several variables involving accidental and non-accidental injury are significant predictors of exposure to danger in getting home at night, and this in turn is a significant predictor of substance abuse (such as cannabis smoking and alcohol bingeing).

The relationships between physical injury, exposure to danger in getting home at night and substance abuse indicate that many adolescents are *amplifying* the dangers to which they are exposed. Thus, being intoxicated by alcohol may increase the probability of being injured while walking home at night. In addition, these relationships suggest some possible mechanisms whereby some of the risk behaviours are interrelated; however, these potential mechanisms would need to be investigated in studies designed specially to address this issue.

Specific finding #5

Cannabis smoking, alcohol bingeing, and variables regarding exposure to danger in getting home at night are predictors of and predicted by having had sexual intercourse.

Many of the associations between having had sexual intercourse and other risk behaviours (such as cannabis smoking, alcohol bingeing, and exposure to danger in getting home at night) have been previously documented in other samples of adolescents (Choquet and Manfredi, 1992; Goode, 1972; Irwin and Millstein, 1986). These risk behaviours may increase the probability of experiencing the adverse consequences of sexual activity such as sexually transmitted infections or unwanted pregnancy. Thus, being under the influence of cannabis or alcohol may result in the adolescent being less cautious regarding engaging in sexual

activity or, if sexual activity is underway, practicing safer sex techniques. Also, exposing oneself to danger in getting home at night renders one more vulnerable to unwelcome sexual advances or sexual assault.

In conclusion, it would appear that the probability of adverse sequalae of risk behaviours such as exposure to danger in getting home at night and sexual intercourse is amplified by the presence of the other risk behaviours enumerated above. This reinforces the necessity for a comprehensive approach to the prevention of adolescent risk behaviour as opposed to focusing on specific behaviours (Dryfoos, 1994).

Although the results reported in this thesis illustrate the importance of conducting multivariate analyses of adolescent risk behaviour, the cross-sectional study design precludes attributing causal explanations to the relationships documented. This is exemplified by the behaviours mentioned in the previous paragraph, *viz.* having experienced sexual intercourse and going out at night beyond the neighbourhood and walking home alone: each of these behaviours can lead to the other. To the extent that these variables may be causally related, it is impossible to determine the "direction" in which this causality operates. Longitudinal studies are required to elucidate questions of this nature.

5.4 SUGGESTIONS FOR FUTURE RESEARCH

The methodological limitations of the study forming the subject of this thesis have been discussed in Section 5.1 above. In addition to these *methodological* limitations, there were also limitations in terms of the *scope* of the project. These latter limitations indicate the necessity for future research projects, some of which will now be discussed.

5.4.1 The need for longitudinal studies

The study was cross-sectional in nature as opposed to being longitudinal. In this respect, it was similar to the major studies involving adolescent risk behaviour that were carried out in Europe, Canada, and the USA with which the results of the Cape Peninsula study were compared. A systematic literature search failed to unearth any longitudinal studies involving adolescent risk behaviour that have been carried out in Africa. Although a few such studies have been carried out in Europe and North America, they have tended to focus on a narrow range of behaviours and the time period for which the subjects were followed up tended to be relatively brief (Costa *et al.*, 1995; Jessor *et al.*, 1991; Jessor and Jessor, 1977; Kelder *et al.*, 1994; Klepp *et al.*, 1993).

Although cross-sectional studies are sufficient to address the kind of questions enumerated in the Objectives of this study, there are important research questions regarding adolescent risk behaviour for which longitudinal or cohort studies are the optimal methodology. These include questions involving the extent to which (Yach and Botha, 1987; Robins and Rutter, 1990):

- the risk behaviours in which an individual engages change over time;

- the occurrence of one risk behaviour or set of risk behaviours, other risk factors, or variables predicted by theoretical frameworks, predict the onset, maintenance, or cessation of risk behaviours; and

- the risk behaviours in which an individual engages change in response to intervention programmes, legislative changes, and socio-economic factors.

Longitudinal or cohort studies are required in South Africa to address the above issues.

5.4.2 The need for national and sub-continental data regarding adolescent risk behaviour

Although the sample in the study forming the basis of this thesis is representative of non-absent high-school students in the Cape Peninsula, it is not known the extent to which the results are generalisable to other regions in the country and other states in the sub-continent.

These data are necessary to inform policy initiatives on national and sub-continental levels. Each of these aspects will be discussed separately.

a) National data

There are large differences between the regions of South Africa in terms of demographic profile, culture, urbanisation status, and economic base (Human Sciences Research Council, 1994). For this reason, it is necessary to exercise caution in assuming that the results obtained in the Cape Peninsula will also be valid for other regions in South Africa (or even for the rural parts of the Western Cape).

Preliminary steps have been taken to carry out a national adolescent risk behaviour study that will have as its study population all students attending high schools in South Africa (Flisher, 1994a). Besides the anticipated scientific value of the proposed study, it is hoped that the following purposes will be achieved (WHO, 1993b).

- Provide a basis and justification for national health and education policy by revealing current priorities in terms of adolescent risk behaviour.

- Provide data to justify and assist with planning school-based intervention strategies.

- Provide data that can be used in the design of specific interventions; for example, information may be provided regarding predictors of risk behaviour, some of which may be modifiable through intervention efforts.

- Contribute towards strengthening the capacity for research in South Africa as well as demonstrating the usefulness of research in terms of public health priorities in South Africa.

- Facilitate productive contact between researchers and administrators in the education and health sectors in various parts of the country. This is necessary given the multi-disciplinary nature of health promotion and the hitherto fragmented approach to this area in South Africa (Flisher and Reddy, 1995).

b) Sub-continental data

Just as it is not possible to generalise findings obtained in one region of South Africa to other regions of the country, so it is not possible to generalise findings from one country in a region to other countries in that region. Attempts are currently underway to secure funding for carrying out simultaneous surveys with similar methodology in several countries in Southern Africa. The proposed national survey mentioned above would comprise the South African contribution to this enterprise.

There are several advantages to this proposed undertaking, including the following (WHO, 1993b).

- Results could be compared between countries, and attempts made to account for differences in terms of economic, political, social, and cultural differences between the countries.

- Differences between countries could be used to motivate for improvements in those countries where the data indicate greater problems.

- The research capacity of the region could be enhanced, and experience in this region may be of benefit to those in other regions undertaking similar projects.

- Access to funding could be facilitated.

There are also some disadvantages of producing comparable data across countries, including the possibility of stigmatisation of countries for which the data indicate a greater extent of involvement in risk behaviour. However, as mentioned in the Literature Review, the HBSC study is carried out in many European countries, and the consensus appears to be that the advantages of this outweigh the disadvantages (Smith *et al.*, 1992).

5.4.3 The need for qualitative data

Although there are considerable advantages in conducting large-scale epidemiological studies such as those discussed above, they do not provide information regarding the *meaning* that risk behaviour has for the individual. Intervention programmes that are not informed by this dimension are unlikely to succeed. It is only by qualitative research that this deficiency can be corrected.

This comprised part of the rationale for conducting the study mentioned previously in which qualitative methods were used to study the reasons that adolescents drink (Ziervogel, 1994; Ziervogel *et al.*, 1994). This study involved only students attending a "Model C" school administered by the House of Assembly. However, a further study including adolescents from

diverse backgrounds has been completed (Professor B. A. Robertson, personal communication). Additional qualitative studies involving adolescents in South Africa have addressed the development of anti-substance abuse health promotion in intervention (Goldstein, 1994), the evaluation of an AIDS education photo-comic (Mathews *et al.*, 1994), and condom use and acquisition (S.S. Abdool Karim *et al.*, 1992; Q. Abdool Karim *et al.*, 1992a,b). There are several other risk behaviours that would benefit from being addressed using qualitative methods. In addition, the reasons for the relationships between risk behaviours that were documented in the project reported in this thesis may be elucidated using qualitative methods.

Qualitative studies inevitably involve small groups of adolescents and caution is required in generalising to the population of adolescents from which the small group was drawn. It is thus necessary to proceed to nomothetic epidemiological studies to determine the extent to which the findings generated from the qualitative studies apply to adolescents in general. The results produced by these epidemiological studies may in turn require explanation, and qualitative studies would again be indicated. An interactive cycle is thus established in which quantitative and qualitative investigations complement and inform each other.

5.5 IMPLEMENTATION OF RESEARCH FINDINGS

The results of the study among Cape Peninsula adolescents indicated that large numbers of high-school students in the Cape Peninsula are engaging in risk behaviours including suicidal behaviour, cigarette smoking, drug and alcohol use, unsafe road-related behaviour, interpersonal violence, and sexual behaviour.

Specific interventions aimed at improving the behavioural health of South African adolescents will be maximally effective in the presence of sound national socio-economic development and appropriate public health legislation that is rigorously enforced (Flisher and Reddy, 1995). This is relevant for, *inter alia*, firearm possession (Lerer and Hansson, 1993), corporal punishment (Orentlicher, 1992), and the taxation and advertising of alcohol and tobacco (Yach, 1993b). Also, facilities and training in adolescent behavioural health at the academic complexes and other hospitals needs to be improved (Kibel, 1991; Kibel and Epstein, 1986, Kibel *et al.*, 1993). The capacity of primary health care services to respond to adolescent risk behaviours needs to be increased by policy changes and appropriate training (Q. Abdool Karim *et al.*, 1992a,b; Flisher *et al.*, 1991, 1992; Van Coeverden de Groot and Greathead, 1991). One component of this could involve establishing centres dedicated to adolescent well-being at which adolescents would feel comfortable and welcome (Möller, 1991; Springer, 1991).

However, the priority of a national effort to address adolescent health in both urban and rural areas should be the school system (Cilliers, 1989; Flisher and Reddy, 1995; Ijsselmuiden *et al.*, 1988; Jameson *et al.*, 1993; Seager, 1990). Some promising pilot studies for specific risk behaviours were described in the sections of the Discussion dealing with the

individual risk behaviours. However, the programmes that currently exist in South African schools tend to have various unsatisfactory characteristics (James, 1994), which were listed by Flisher and Reddy (1995, p 629) as follows:

- *there is an emphasis on the physiology and anatomy of the human body;*

- *screening has been prioritised, despite limited referral pathways and minimal evidence that the effort expended was justified;*

- *the social, economic and political context of the students and their behaviour is not recognised;*

- *information about behaviours that place people at risk is scanty, and when a behaviour is addressed, this is not comprehensively done, for example, in certain programmes students are provided with the choice of using condoms, but are not taught how to do so or where to obtain them;*

- *little or no attention is given to the relationships between different forms of risk behaviour, for example the manner in which substance use can remove inhibitions, resulting in unsafe sexual behaviour;*

- *almost no attention is given to the development of skills that enable students to choose health-promoting behaviours;* and

- *the importance of adults as role models is not recognised, for example students are taught about the dangers of smoking while teachers smoke in their presence.*

The finding that large numbers of Cape Peninsula adolescents are engaging in risk behaviour, in the face of the above unsatisfactory characteristics of existing school-based health promotion programmes, indicates that implementation of the findings from the present study should be prioritised. Yach and Dick (unpublished document) have emphasised the importance of researchers being innovative not only in terms of providing new knowledge but also in marketing it. They state:

> *The purpose of epidemiological research is to investigate the distribution and determinants of disease in the community with the objective of designing interventive strategies to promote the health and well-being of these communities. Epidemiological research thus has a clear implementation goal.*
>
> (Yach and Dick, unpublished document, p3)

What steps have been taken to facilitate the implementation of the findings from the present study? The education departments that participated in the study have received reports in which the results of the study were presented and discussed (Flisher *et al.*, 1993a-h); however, it is unclear the extent to which this has contributed to policy changes.

The media can play an important role in influencing public opinion which ultimately influences decision makers (Wallack, 1990). This influence can be negative; by interpreting the data in a biased manner or providing an unbalanced selection of findings, the media can exert a negative influence

(Yach and Dick, unpublished document). With these considerations in mind, careful planning went into the dissemination of the results in the national media. The Public Relations Unit of the Medical Research Council took the main responsibility for this aspect, in close collaboration with the research team. The following activities involving this candidate and other members of the research team took place: *(i)* a television interview lasting approximately 15 minutes on the programme "Good Morning, South Africa"; *(ii)* a radio interview; *(iii)* a press conference attended by approximately thirty journalists; and *(iv)* several telephonic interviews by journalists from various newspapers. It would appear that the strategy had its intended effect. There were a substantial number of articles in newspapers in various parts of the country and in a national newspaper. These articles, as well as the television and radio interviews, conveyed a balanced impression of the results of the study and their implications.

Finally, this candidate was the Convenor of a workshop entitled: *Health Promotion Through Schools in South Africa*, which was held in Cape Town on 21 and 22 July, 1994. Other members of the organising committee were: *(i)* Ms C. Everett, National AIDS Research Programme, Medical Research Council; *(ii)* Ms S. James, School Health Services, Department of National health and Population Development; *(iii)* Professor S. Lazarus, Department of Educational Psychology, University of the Western Cape; *(iv)* Ms P. Reddy, National AIDS Research Programme, Medical Research Council; and *(v)* Ms T. Vergnani, Department of Educational Psychology, University of the Western Cape.

Besides the project reported in this thesis, an additional spur for the workshop was the involvement of most of the workshop's organising committee in the Western Cape Education Support Services Policy

Research and Development Project. The meeting was funded by the Medical Research Council and the Department of Psychiatry of the University of Cape Town.

The aims of the workshop were: *(i)* to describe the current situation as regards health promotion in South African schools; *(ii)* to facilitate the development, implementation, and evaluation of meaningful health promotion programmes through South African schools; *(iii)* to foster inter-sectoral collaboration between health and education service providers and researchers in the above tasks; and *(iv)* to identify unmet research needs in the facilitation, implementation, and evaluation of these programmes.

Approximately 35 individuals attended the workshop, all of whom were: *(i)* involved in the implementation of existing health promotion programmes in schools or related contexts; *(ii)* in a position where they could influence policy development in the field; or *(iii)* involved in relevant research. In addition, it was a priority to include youth and teacher organisations, and also to include all provinces in the country. A special guest at the meeting was Dr Desmond O'Byrne, Chief, Health Education and Health Promotion Unit, Division of Health Education, World Health Organisation, Geneva. This candidate gave a presentation at the workshop consisting of, *inter alia*, some of the highlights of the findings from the study reported in this thesis.

A task force was formed from participants at the workshop. The goals of this task force included: pursuing the development of the goals and strategies emerging from the meeting; advocating for health promotion through schools; providing a coordinated effort in the development of health promotion through schools; acting as a watch-dog around issues relating to health promotion through schools; pursuing the issue of

intersectoriality; consulting with all relevant stakeholders; investigating the possibility of a national conference on health promotion through schools; and developing a picture of current initiatives.

The task force is well placed to exert a meaningful influence on the development of health promotion programmes in South African schools. To the extent that the project described in this thesis contributed the instigation and content of the workshop, one can argue that the workshop assisted with implementing the findings of the project on a national scale.

5.6 CONCLUSION

Section 5.5 contained a description of the steps that have been taken to contribute to the implementation of health promotion through schools in South Africa. However, the facets of a health-promoting school were not outlined. According to the a multi-agency report of the United Nations (WHO/UNESCO/UNICEF, 1992), these include: *(i)* a *school environment* component, including electricity provision and sanitation (Mathee, 1994); *(ii)* a *school health services* component, including case-finding of students in need; and *(iii) comprehensive school health education.* Comprehensive school health education has been characterised as follows:

> *Comprehensive school health education views health holistically in that it addresses the interrelatedness of health problems and the sociopolitical and economic factors that underscore them. It utilises formal and informal educational opportunities for health. It combines formal and informal educational opportunities for health. It combines conventional and innovative pedagogy with the use of resources from within and outside the school environment. It strives to synchronise health messages through various communication mechanisms, including commercial advertising, the community, health information systems, family, peers and the school. Finally, it empowers children and youth to act for healthy living and to support conditions supportive of health.*
>
> (Flisher and Reddy, 1995, p 629)

Not only are the results of this study relevant in terms of motivating for the development of health promoting schools, but also for their nature; for example, there are implications of the findings regarding the

interrelationships between risk behaviours for case finding and comprehensive school health education (Section 5.3).

Although there is evidence from the USA that schools embodying these concepts are effective (Dryfoos, 1994a,b) a necessary initial step in South Africa is the establishment of demonstration projects to ascertain whether they are appropriate, efficacious, and economically feasible in this context.

Finally, just as adolescence is a transitional phase in the development of an individual, so South Africa is at a transitional phase in its development as a nation. For both for an individual and a nation, interventions made in a transitional phase are likely to have far-reaching consequences. By responding promptly and comprehensively to the health needs of South African adolescents, an opportunity would be exploited to address many of the youth, health, and urbanisation priorities that are implicit in the Reconstruction and Development Programme (Carolus, 1994).

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Appendix 1

UNIVERSITY OF CAPE TOWN

Department of Psychiatry

QUESTIONNAIRE ON HEALTH RELATED BEHAVIOUR

* Please will you fill in this questionnaire. It is not nearly as long as it looks - it will only take you about 20 minutes to fill in. We are trying to find out if the way you live could affect your health. Your responses are very important to us. We would like to make suggestions about what could be done to improve the health of young people in the Cape Peninsula.

* We shall give you a fact sheet regarding some of the things asked about in the questionnaire (eg. AIDS, smoking and assault).

* This is not a test and there are no right and wrong answers.

* You will be given the opportunity to make any comments you wish at the end of the questionnaire.

* You are not asked to give your name and nobody will know who filled in this questionnaire.

* In questions where there are boxes, please tick the box next to the answer that you want to give. Please do not write to the right of the line going down the right hand side of the page. Once you have finished filling in the questionnaire, please put it in the envelope.

THANK YOU VERY MUCH FOR YOUR COOPERATION

QUESTIONS ABOUT YOURSELF ☐☐☐☐☐ 5

Before starting with the actual questions, we need to know a few things about you

Which school do you attend? _____ ☐☐☐ 8

How old are you? _____ years ☐☐ 10

What is your sex?

MALE ☐

FEMALE ☐ ☐

In which class are you? (e.g. 7f) _____ ☐☐☐ 14

Do you live with your mother?

NO ☐

YES ☐ ☐

Do you live with your father?

NO ☐

YES ☐ ☐

Which of the following languages are spoken at home?

ENGLISH ☐ ☐

AFRIKAANS ☐ ☐

XHOSA ☐ ☐

OTHER ☐ ☐

How long have you lived in a city since birth?

_____ years ☐☐ 22

PART 1

The questionnaire begins with items regarding things you do (or don't do!) that could affect your physical safety.

1. Are you able to swim?

NO ☐

YES ☐ ☐ 23

2. Have you swum at all during the past 12 months?

NO ☐

YES ☐ ☐

IF YES:

a. Did you ever experience strong currents in the water in the past 12 months?

NO ☐

YES ☐ ☐

b. Did you ever dive into water of uncertain depth in the past 12 months (excluding scuba diving)?

NO ☐

YES ☐ ☐ 26

3. In the past 12 months have you ridden on a motor-bike or motorscooter as a passenger or a driver?

NO ☐

YES ☐ ☐ 27

IF YES:

In the past 12 months, did you ever ride without a helmet?

NO ☐

YES ☐ ☐

4. In the past 12 months have you been involved in an accident while travelling in a motor vehicle (excluding motor bikes)?

NO ☐

YES ☐ ☐

5. In the past 12 months have you been injured by a motor vehicle, motorbike or bicycle while walking or standing?

NO ☐

YES ☐ ☐ 30

6. In the past 12 months, did you ever travel in the front passenger seat of a motor vehicle?

NO ☐

YES ☐ ☐ 31

If YES:

On the last occasion you were travelling in the front passenger seat of a motor vehicle was there a seat belt available?

NO ☐

YES ☐

DON'T KNOW ☐ ☐

If YES, did you actually wear the seat belt for the whole journey?

NO ☐

YES ☐ ☐

7. Do you think that wearing a seat belt gives you less chance of being injured in a motor vehicle accident?

NO ☐

YES ☐

NOT SURE ☐ ☐ 34

9. Have you ever driven a motor vehicle (excluding a motor bike) on a public road?

NO ☐

YES ☐ ☐ 40

IF YES:

In the past 12 months have you driven

a. A vehicle that was overcrowded?

NO ☐

YES ☐

NOT SURE ☐ ☐

b. A vehicle that was not roadworthy?

NO ☐

YES ☐

NOT SURE ☐ ☐

c. Without a licence?

NO ☐

YES ☐ ☐

d. While affected by alcohol or dagga?

NO ☐

YES ☐ ☐ 44

In most of the next few questions we are trying to find out how much you are affected by physical violence between people.

10. During the past 12 months <u>at school</u>

a. Have you been physically injured by another pupil?

NO ☐

YES ☐ ☐ 45

b. Have you been physically injured by a member of staff (excluding corporal punishment)?

NO ☐

YES ☐ ☐

c. Have you physically injured another pupil?

NO ☐

YES ☐ ☐

d. Have you been robbed?

NO ☐

YES ☐ ☐

e. Have you caused serious damage to property?

NO ☐

YES ☐ ☐ 49

10. During the past 12 months <u>at school</u>

f. Have you experienced sexual harassment or interference by another pupil?

NO ☐

YES ☐ ☐ 50

g. Have you experienced sexual harassment or interference by a member of staff?

NO ☐

YES ☐ ☐

11. During the past 12 months <u>at home</u>

a. Have you been physically hurt by an adult?

NO ☐

YES ☐ ☐

b. Have you experienced sexual harassment or interference?

NO ☐

YES ☐ ☐ 53

12. During the past 12 months <u>outside of home or school</u>

a. Have you been physically injured by anybody?

NO ☐

YES ☐ ☐ 54

b. Have you physically injured anybody?

NO ☐

YES ☐ ☐

c. Have you caused serious damage to property?

NO ☐

YES ☐ ☐

d. Have you experienced sexual harassment or interference?

NO ☐

YES ☐ ☐ 57

13. During the past 4 weeks <u>at school</u> did you ever carry a knife to be used as a weapon?

NO ☐

YES ☐ ☐

IF YES:

Did you always carry a knife?

NO ☐

YES ☐ ☐ 59

14. During the past 4 weeks <u>at school</u> did you ever carry any other weapon or weapons?

NO ☐

YES ☐ ☐ 60

IF YES:

Did you always carry another weapon?

NO ☐

YES ☐ ☐

What was the weapon or weapons? _____

_____ ☐☐☐ 6

15. During the past 4 weeks did you go out at night beyond your neighbourhood without knowing how you were going to get home?

NO ☐

YES ☐ ☐

16. During the past 4 weeks did you go out at night beyond your neighbourhood and walk home alone?

NO ☐

YES ☐ ☐

17. During the past 4 weeks did you go out at night beyond your neighbourhood and hitch-hike home?

NO ☐

YES ☐ ☐ 67

The last 3 questions in this part have to do with certain aspects of self harm.

18. During the past 12 months did you ever seriously think about harming yourself in a way that might result in your death?

NO ☐

YES ☐ ☐ 68

19. During the past 12 months did you ever tell anyone that you intended putting an end to your life?

NO ☐

YES ☐ ☐

20. During the past 12 months did you ever actually try to put an end to your life?

NO ☐

YES ☐ ☐ 70

PART 2

The final 3 parts of the questionnaire are far shorter than the first part. In this part we are concerned with the use of cigarettes and various substances that could affect your health.

1. Do you smoke at least one cigarette per day?

NO ☐

YES ☐ ☐ 71

IF YES:

Have you ever tried stopping?

NO ☐

YES ☐ ☐

IF NO:

Have you ever smoked?

NO ☐

YES ☐ ☐

Do you intend to start smoking?

NO ☐

YES ☐ ☐ 74

2. Have you ever used tablets, powders or medicine for pain (e.g. Panado)?

NO ☐

YES ☐ ☐ 75

If YES:

How many times have you used them in the past 7 days?

_____ ☐☐☐ 78

How many times have you used them in the past 4 weeks?

New card

_____ ☐☐☐ 1 3

For what reasons have you used the tablets, powders or medicine? _____

_____ ☐☐☐

3. Have you ever smoked dagga on its own?

NO ☐

YES ☐ ☐

If YES:

How many times have you smoked dagga on its own in the past 7 days?

_____ ☐☐☐

How many times have you smoked dagga on its own in the past 4 weeks?

_____ ☐☐☐ 13

4. Have you ever smoked dagga and Mandrax together ("white pipes")?

NO ☐

YES ☐ ☐ 14

If YES:

How many times have you smoked dagga and Mandrax together in the past 7 days?

_____ ☐☐☐

How many times have you smoked dagga and Mandrax together in the past 4 weeks?

_____ ☐☐☐ 2

5. Have you ever sniffed glue, petrol or thinners?

NO ☐

YES ☐ ☐

If YES:

How many times have you sniffed glue, petrol or thinners in the past 7 days?

_____ ☐☐☐

How many times have you sniffed glue, petrol or thinners in the past 4 weeks?

_____ ☐☐☐ 2

6. Have you ever used Lovar-25?

NO ☐

YES ☐ ☐ 28

If YES:

How many times have you used Lovar-25 in the past 7 days?

_____ ☐☐☐

How many times have you used Lovar-25 in the past 4 weeks?

_____ ☐☐☐ 34

7. Have you ever used injectable drugs (mainlining)?

NO ☐

YES ☐ ☐

If YES:

How many times have you used injectable drugs in the past 7 days?

_____ ☐☐☐

How many times have you used injectable drugs in the past 4 weeks?

_____ ☐☐☐ 41

8. Have you ever used any other types of drugs?

NO ☐

YES ☐ ☐ 42

If YES:

Please name the other types of drugs you have used.

_____

_____

_____

_____

_____

☐☐☐
☐☐☐ 4

9. Have you ever used alcohol (including beer and wine)?

NO ☐

YES ☐ ☐

If YES:

How many times have you used alcohol in the past 7 days?

_____ ☐☐☐

How many times have you used alcohol in the past 4 weeks?

_____ ☐☐☐

How many times have you had 5 or more drinks on one occasion in the past 14 days?

_____ ☐☐☐

PART 3

Thank you for answering the questions so far. We should appreciate it if you would answer the last few questions which are concerned with sexual relationships. Although we realise that some students may be embarrassed by some of the questions, it is important for us to have this information to plan programmes to prevent certain diseases (eg. AIDS) and teenage pregnancies.

1. Have you ever had heterosexual vaginal intercourse? This means intimate contact with someone of the opposite sex during which the penis enters the vagina (female private parts).

NO ☐

YES ☐ ☐ 59

If NO - Males: please go to question 6 (page 21)

- Females: please go to PART 4 (page 23)

If YES: Please turn the page over and answer the following five questions.

2. How long ago did you last have vaginal intercourse? ☐☐☐

_____

ON THAT OCCASION:

How old was your partner? _____ years ☐☐

Had you known your partner for more than 7 days?

NO ☐

YES ☐ ☐

Did you or your partner do or use anything to prevent pregnancy (family planning)?

NO ☐

YES ☐

DON'T KNOW ☐ ☐ 66

If YES, what did you or your partner use? (Indicate more than one if necessary)

Condom ("rubber")	☐	☐
Injection	☐	☐
Contraceptive pill ("the pill")(incl. Diane)	☐	☐
Cap or diaphragm	☐	☐
Spermacidal gel or foam	☐	☐
IUCD, IUD, Copper T ("loop")	☐	☐
Withdrawal or coitus interruptus	☐	☐
"Safe period" or rhythm /calendar method	☐	☐ 74

3. How old were you when you first had vaginal intercourse?

_____ years ☐☐ 76

4. With how many different partners have you had vaginal intercourse in the past 12 months?

_____ ☐☐☐

5. Have you ever had heterosexual anal intercourse? This means intimate contact with someone of the opposite sex during which the penis enters the anus ("back passage").

NO ☐

YES ☐ ☐ 80

Females: please go to part 4 (page 23)

Males: please turn over and carry on!

THE REST OF THIS PART IS FOR MALES ONLY

6. Have you ever had homosexual anal intercourse? This means intimate contact with another male during which the penis enters the anus ("back passage")?

NO ☐

YES ☐

New card ☐ 1

If NO, please go to PART 4 (page 23)

If YES: Please turn over and answer the very last 3 questions

7. How long ago did you last have homosexual anal intercourse?

_____ ☐☐☐ 4

ON THAT OCCASION

How old was your partner? _____ years ☐☐

Had you known your partner for more than 7 days?

NO ☐

YES ☐ ☐

Did you or your partner use a condom ("rubber")?

NO ☐

YES ☐ ☐ 8

8. How old were you when you first had homosexual anal intercourse?

_____ years ☐☐

9. With how many different partners have you had homosexual anal intercourse in the past 12 months?

_____ ☐☐☐ 13

PART 4

Please use the space below to make any comments you wish.

THANK YOU FOR YOUR COOPERATION!

UNIVERSITY OF CAPE TOWN

Department of Psychiatry

VRAELYS OP GESONDHEIDS VERWANTE GEDRAG

* Sal u asseblief hierdie vraelys voltooi. Dit is nie naasteby so lank as wat dit voorkom nie - dit sal u omtrent 20 minute neem om dit te voltooi. Ons probeer vasstel of die manier hoe u lewe 'n invloed op u gesondheid kan hê. U reaksies is baie belangrik vir ons. Ons sal graag voorstelle wil maak oor wat gedoen kan word om die gesondheid van jong mense in the Kaapse Skiereiland te verbeter.

* Ons sal 'n feite staat aangaande sekere van die aspekte wat in die vraelys voorkom (soos byv. AIDS, rook en aanrandings) aan u gee.

* Dit is nie 'n toets nie; daar is geen regte of verkeerde antwoorde nie.

* Aan die einde van die vraelys sal u die geleentheid gegee word om enige opmerking wat u graag wil bydra te maak.

* U word nie gevra om u naam te verstrek nie en niemand sal weet wie die vraelys voltooi het nie.

* In die vrae waar blokkies bestaan, maak asseblief net 'n regmerkie in the blokkie langs die antwoord wat u wil gee. Moet asseblief nie regs van die lyn aan die regterkant van die bladsy skryf nie. Wanneer u die vraelys voltooi het, sit dit asseblief in die koevert.

BAIE DANKIE VIR U SAMEWERKING

VRAE OMTRENT U SELF

Voordat ons met die werklike vrae begin, moet ons 'n paar dinge van u weet.

In watter skool is u? _____

Hoe oud is u? _____ jare

Van watter geslag is u?

MANLIK ☐

VROULIK ☐

In watter klas is u nou? (byv. 7f) _____

Woon u by u moeder?

NEE ☐

JA ☐

Woon u by u vader?

NEE ☐

JA ☐

Watter van die volgende tale praat u by die huis?

ENGELS ☐

AFRIKAANS ☐

XHOSA ☐

ANDER ☐

Vanaf geboorte, hoe lank woon u in enige stad?

_____ jare

DEEL 1

Die vraelys begin met items in verband met dinge wat u doen (of nie doen nie) wat 'n invloed kan hê op u fisiese veiligheid.

1. Kan u swem?

NEE ☐

JA ☐ ☐ 23

2. Het u al ooit gedurende die afgelope 12 maande geswem?

NEE ☐

JA ☐ ☐

INDIEN JA:

a. Het u ooit sterk getye in die water ondervind gedurende die afgelope 12 maande?

NEE ☐

JA ☐ ☐

b. Het u in die afgelope 12 maande in water geduik waarvan u nie seker was van die diepte nie (uitsluitende skubaduik)?

NEE ☐

JA ☐ ☐ 26

3. In die afgelope 12 maande het u op 'n motorfiets of bromponie gery as 'n passasier of self bestuur?

NEE ☐

JA ☐ ☐ 27

INDIEN JA:

In die afgelope 12 maande het u ooit sonder 'n valhelm gery?

NEE ☐

JA ☐ ☐

4. In die afgelope 12 maande was u ooit in 'n ongeluk betrokke terwyl u in 'n motor voertuig (uitsluitende 'n motorfiets) gereis het?

NEE ☐

JA ☐ ☐

5. In die afgelope 12 maande was u ooit getref deur 'n motor voertuig, motorfiets of fiets terwyl u geloop of gestaan het?

NEE ☐

JA ☐ ☐ 30

6. In die afgelope 12 maande het u ooit in die voorste passasier sitplek van 'n motor voertuig gereis?

NEE ☐

JA ☐ ☐ 31

INDIEN JA:

Op die <u>laaste</u> geleentheid wat u in die voorste passasiers sitplek van 'n motor voertuig gereis het, was daar 'n veiligheidsgordel beskikbaar?

NEE ☐

JA ☐

WEET NIE ☐ ☐

Indien JA, het u werklik die veiligheidsgordel vir die hele reis gedra?

NEE ☐

JA ☐ ☐

7. Dink u dat die dra van 'n veiligheidsgordel die kanse verminder dat u beseer kan word tydens 'n motor voertuig ongeluk?

NEE ☐

JA ☐

NIE SEKER NIE ☐ ☐ 34

8. In die afgelope 12 maande het u in 'n motor voertuig gereis?

NEE ☐

JA ☐ ☐ 35

INDIEN JA:

In die afgelope 12 maande het u in 'n motor voertuig gereis wetende of met 'n sterk vermoede dat

a. Daar te veel mense in die voertuig is?

NEE ☐

JA ☐ ☐

b. Die voertuig nie padvaardig of veilig is om te bestuur nie?

NEE ☐

JA ☐ ☐

c. Die bestuurder nie 'n bestuurslisensie het nie?

NEE ☐

JA ☐ ☐

d. Die bestuurder geaffekteer is deur alkohol of dagga?

NEE ☐

JA ☐ ☐ 39

9. Het u al ooit 'n motor voertuig (uitsluitende 'n motorfiets) bestuur op 'n publieke pad?

NEE ☐

JA ☐ ☐ 40

INDIEN JA:

In die afgelope 12 maande het u bestuur

a. Met te veel mense in die voertuig?

NEE ☐

JA ☐ ☐

b. In 'n voertuig wat nie padvaardig was nie?

NEE ☐

JA ☐ ☐

c. Sonder bestuurslisensie?

NEE ☐

JA ☐

NIE SEKER NIE ☐ ☐

d. Terwyl u onder die invloed van alkohol of dagga was?

NEE ☐

JA ☐

NIE SEKER NIE ☐ ☐ 44

In die meeste van die volgende paar vrae wil ons probeer uitvind tot watter mate u geaffekteer word deur fisiese geweld tussen mense

10. Gedurende die afgelope 12 maande <u>by die skool</u>

a. Was u fisies beseer deur 'n ander leerling?

NEE ☐ ☐ 45

JA ☐

b. Was u fisies beseer deur 'n lid van die personeel? (Uitsluitende lyfstraf)

NEE ☐

JA ☐ ☐

c. Het u 'n ander leerling fisies beseer?

NEE ☐

JA ☐ ☐

d. Was u beroof?

NEE ☐

JA ☐ ☐

e. Het u ernstige skade aan eiendom aangerig?

NEE ☐

JA ☐ ☐ 49

10. Gedurende die afgelope 12 maande <u>by die skool</u>

f. Het u enige ongewensde seksuele toenadering of molestering deur 'n ander leerling ondervind?

NEE ☐

JA ☐ ☐ 50

g. Het u enige ongewensde seksuele toenadering of molestering deur 'n lid van die personeel ondervind?

NEE ☐

JA ☐ ☐

11. Gedurende die afgelope 12 maande <u>tuis</u>

a. Was u fisies beseer deur 'n volwasse persoon?

NEE ☐

JA ☐ ☐

b. Het u enige ongewensde seksuele toenadering of molestering ondervind?

NEE ☐

JA ☐ ☐ 53

12. Gedurende die afgelope 12 maande <u>buite die huis of skool</u>

a. Het iemand u fisies beseer?

NEE ☐

JA ☐ ☐ 54

b. Het u iemand fisies beseer?

NEE ☐

JA ☐ ☐

c. Het u ernstige skade aan eiendom aangerig?

NEE ☐

JA ☐ ☐

d. Het u enige ongewensde seksuele toenadering of molestering ondervind?

NEE ☐

JA ☐ ☐

13. Gedurende die afgelope 4 weke <u>by die skool</u> het u ooit 'n mes gedra om as wapen te gebruik?

NEE ☐

JA ☐ ☐

INDIEN JA:

Het u altyd 'n mes gedra?

NEE ☐

JA ☐ ☐ 59

14. Gedurende die afgelope 4 weke <u>by die skool</u> het u ooit enige ander wapen of wapens gedra?

NEE ☐

JA ☐ ☐ 60

INDIEN JA:

Het u altyd 'n ander wapen gedra?

NEE ☐

JA ☐ ☐

Watter soort wapen of wapens? _____

_____ ☐☐☐ 64

15. Gedurende die afgelope 4 weke het u na donker verder as u woonbuurt uitgegaan en nie geweet hoe u huis toe sou kom nie?

NEE ☐

JA ☐ ☐

16. Gedurende die afgelope 4 weke het u na donker verder as u woonbuurt uitgegaan en alleen huistoe geloop?

NEE ☐

JA ☐ ☐

17. Gedurende die afgelope 4 weke het u na donker verder as u woonbuurt uitgegaan en duim gery huistoe?

NEE ☐

JA ☐ ☐ 67

Die laaste 3 vrae in hierdie deel het te doen met sekere aspekte van self beserings.

18. Gedurende die afgelope 12 maande het u ooit ernstig daaraan gedink on uself te beseer in so 'n mate dat dit u dood as gevolg kon meebring?

NEE ☐

JA ☐ ☐ 68

19. Gedurende die afgelope 12 maande het u ooit iemand vertel dat u van voornemens was om 'n einde aan u lewe te maak?

NEE ☐

JA ☐ ☐

20. Gedurende die afgelope 12 maande het u ooit probeer om 'n einde aan u lewe te maak?

NEE ☐

JA ☐ ☐ 70

DEEL 2

Die laaste 3 dele van die vraelys is heelwat korter as die eerste deel. In dié deel is ons geïntereseerd in die gebruik van sigarette en 'n verskeidenheid ander middels wat 'n uitwerking op u gesondheid kan hê.

1. Rook u ten minste een sigaret per dag?

NEE ☐

JA ☐ ☐ 71

INDIEN JA:

Het u al ooit probeer ophou?

NEE ☐

JA ☐ ☐

INDIEN NEE:

Het u al ooit gerook?

NEE ☐

JA ☐ ☐

Is u van voornemens om te begin rook?

NEE ☐

JA ☐ ☐ 74

2. Het u al ooit tablette, poeiers of medisyne vir pyn gebruik (byv. Panado)?

NEE ☐

JA ☐ ☐ 75

INDIEN JA:

Hoeveel keer het u in die afgelope 7 dae gebruik? _____ ☐☐☐ 78

Hoeveel keer het u dit in die afgelope 4 weke gebruik? _____ Nuwe kaar ☐☐☐ 1 3

Om watter redes het u die tablette, poeiers of medisyne gebruik? _____ ☐☐☐

_____

3. Het u al ooit dagga op sy eie gerook?

NEE ☐

JA ☐ ☐

INDIEN JA:

Hoeveel keer het u in die afgelope 7 dae dagga op sy eie gerook? _____ ☐☐☐

Hoeveel keer het u dit in die afgelope 4 weke dagga op sy eie gerook? _____ ☐☐☐ 13

4. Het u al ooit dagga en Mandrax ("white pipes") saam gerook?

NEE ☐

JA ☐ ☐ 14

INDIEN JA:

Hoeveel keer het u in die afgelope 7 dae dagga en Mandrax saam gerook?

_____ ☐☐☐

Hoeveel keer het u dit in die afgelope 4 weke dagga en Mandrax saam gerook?

_____ ☐☐☐ 20

5. Het u al ooit gom, petrol of verdunner (thinners) gesnuif?

NEE ☐

JA ☐ ☐

INDIEN JA:

Hoeveel keer het u in die afgelope 7 dae gom, petrol of verdunner (thinners) gesnuif?

_____ ☐☐☐

Hoeveel keer het u dit in die afgelope 4 weke gom, petrol of verdunner (thinners) gesnuif?

_____ ☐☐☐ 27

6. Het u al ooit Lovar-25 gebruik?

NEE ☐

JA ☐ ☐ 28

INDIEN JA:

Hoeveel keer in die afgelope 7 dae het u Lovar-25 gebruik? _____ ☐☐☐

Hoeveel keer in die afgelope 4 weke het u Lovar-25 gebruik? _____ ☐☐☐ 34

7. Het u ooit inspuitende dwelms gebruik?

NEE ☐

JA ☐ ☐

INDIEN JA:

Hoeveel keer in die afgelope 7 dae het u inspuitende dwelms gebruik? _____ ☐☐☐

Hoeveel keer dit in die afgelope 4 weke het u inspuitende dwelms gebruik? _____ ☐☐☐ 41

8. Het u al ooit enige ander tipe dwelms gebruik?

NEE ☐

JA ☐ ☐ 42

INDIEN JA:

Noem asseblief die name van die dwelms wat u gebruik.

_____

_____

_____

_____

_____ ☐☐☐ ☐☐☐ 48

9. Het u al ooit alkohol (insluitende bier en wyn) gebruik?

NEE ☐

JA ☐ ☐

INDIEN JA:

Hoeveel keer in die afgelope 7 dae het u alkohol gebruik?

_____ ☐☐☐

Hoeveel keer dit in die afgelope 4 weke het u alkohol gebruik?

_____ ☐☐☐

Hoeveel keer in die afgelope 14 dae het u 5 of meer drankies op een geleentheid gebruik?

_____ ☐☐☐ 58

DEEL 3

Dankie dat u die vrae sover beantwoord het. Ons sal dit waardeer as u die laaste paar vrae ook sal beantwoord wat handel oor seksuele verhoudings. Alhoewel ons besef dat vir sekere studente dit 'n verleentheid mag wees om sekere van die vrae the beantwoord, is dit vir ons belangrik om hierdie informasie to bekom sodat daar beplan kan word om sekere siektes (byv. AIDS) en tienderjarige swangerskappe te voorkom.

1. Het u al ooit heteroseksuele vaginale gemeenskap gehad? Dit beteken intieme kontak met iemand van die teenoorgestelde geslag waartydens die penis die vagina (vroulike privaat dele) binnedring.

NEE ☐

JA ☐ ☐ 59

INDIEN NEE - Manlik: gaan asseblief na vraag 6 (bladsy 21)

- Vroulik: gaan asseblief na DEEL 4 (bladsy 23)

INDIEN JA: Blaai asseblief om en antwoord die volgende vyf vrae.

2. Hoe lank gelede het u laas vaginale gemeenskap gehad? ☐☐☐ 62

_____

OP DAARDIE GELEENTHEID:

Hoe oud was u metgesel? _____ jare ☐☐

Was u metgesel aan u bekend vir meer as 7 dae?

NEE ☐

JA ☐ ☐

Het u of u metgesel enige iets gedoen om swangerskap te voorkom (gesins beplanning)?

NEE ☐

JA ☐

WEET NIE ☐ ☐ 66

Indien JA, wat het u of u metgesel gebruik?
(Dui aan meer as een indien nodig)

Kondom ("f.l.")	☐	☐
Inspuiting	☐	☐
Kontraseptiewe pil ("die Pil") (insluitende Diane)	☐	☐
Kappie	☐	☐
Sperm vernietigende jelie of skuim	☐	☐
IUCD, IUD, Koper T ("loop")	☐	☐
Uittrek of onderbreking	☐	☐
"Veilige periode" of siklus / kalender metode	☐	☐ 74

3. Hoe oud was u toe u vaginale gemeenskap vir die eerste keer ondervind het?

_____ jaar ☐☐ 76

4. Met hoeveel verskillende metgeselle het u vaginale gemeenskap gehad in die afgelope 12 maande?

_____ ☐☐☐

5. Het u ooit heteroseksuele anale gemeenskap gehad? Dit beteken intieme kontak met iemand van die teenoorgestelde geslag waartydens die penis die anus binnedring.

NEE ☐

JA ☐ ☐ 80

Vroulik: gaan asseblief na DEEL 4 (bladsy 23)

Manlik: blaai asseblief om en gaan aan!

DIE RES VAN DIE DEEL IS NET VIR MANLIKE DEELNEMERS

6. Het u ooit homoseksuele anale gemeenskap gehad? Dit beteken intieme kontak met 'n ander manlike persoon waartydens die penis die anus binnedring (agter ingang).

NEE ☐

JA ☐

Nuwe kaart ☐ 1

Indien NEE: gaan asseblief na DEEL 4 (bladsy 23)

Indien JA: blaai asseblief om en beantwoord die laaste 3 vrae

7. Hoe lank gelede het u anale homoseksuele gemeenskap gehad?

_____ ☐☐☐

OP DAARDIE GELEENTHEID

Hoe oud was u metgesel? _____ jaar ☐☐

Was u metgesel aan u bekend vir meer as 7 dae?

NEE ☐

JA ☐ ☐

Het u of u metgesel 'n kondom ("f.l.") gebruik?

NEE ☐

JA ☐ ☐ 8

8. Hoe oud was u toe u vir die eerste keer anale gemeenskap gehad het?

_____ jaar ☐☐

9. Met hoeveel verskillende metgeselle het u anale gemeenskap gehad gedurende die afgelope 12 maande?

_____ ☐☐☐

DEEL 4

Gebruik asseblief die deel vir enige opmerking wat u graag wil maak.

_____

_____

_____

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_____

☐☐☐ 16

BAIE DANKIE VIR U SAMEWERKING!

☐☐☐ 19

IPHEPHA LEMIBUZO NGEZEMPILO ENXULUMENE NOKUZIPHATHA

* Nceda uzalise eliphepha lemibuzo. Alikho lide njengenkangeleko yalo liyakuthatha imizuzu eyi 20 ukulizalisa. Sizama ukukhangela ukuba uhlobo ophila lona lungayonakalisa impilo yakho. Impendulo yakho ibalulekile kakhulu kuthi. Singathanda ukwenza amacebiso okuba kungenziwa ntoni ukuphucula ezempilo kulutsha lophondo lwasekapa.

* Sikunike iphepha elinengcazelo malunga nezinye zezinto kubuzwe zona kweliphepha mibuzo (umzekelo AIDS, ukutshaya, nokuhlaselwa).

* Asilo viwo olu akukho zimpendulo zilungileyo nezingalunganga. Uzokunikwa ithuba lokuba unganika izimvo ozingwenelayo ekupheleni kweliphepha mibuzo.

* Akutshiwongo ukuba nika igama lakho akukho mntu uzolazi uukuba lizaliswe ngubani eliphepha lemibuzo.

* Kwimibuzo apho kukhona ibokisi, nceda beka uphawu kwibokisi esecaleni kwempendulo ofuna ukuyinika. Nincede ningabhali ngapha komngca omde.

* Xa ugqibile ukuzalisa eliphepha lemibuzo, nceda uyifake emvulophini uyishiye ebokisini.

ENKOSI KAKHULU NGOSEBENZISWANO

IMIBUZO NGESIQU SAKHO. ☐☐☐☐☐ 5

Phambi kokuba siqale ngondoqo wemibuzo kufuneka sazi izinto ezimbalwa ngawe.

Sisiphi isikolo ofunda kuso? _____ ☐☐☐ 8

Umdala kangakanani _____ iminyaka ☐☐ 10

Usesiphi isini

INDODA ☐

IBHINQA ☐ ☐

Ngoku ufunda kweliphi ibanga _____ ☐☐ 14

Uhlala nomama wakho?

HAYI ☐

EWE ☐ ☐

Uhlala notata wakho?

HAYI ☐

EWE ☐ ☐

Nithetha oluphi ulwimi kwezizilandelayo ekhaya?

ISINGESI ☐ ☐

ISIBHULU ☐ ☐

ISIXHOSA ☐ ☐

OLUNYE ☐ ☐

Okoko wazalwa uhleli ixesha elingakanani edolophini?

_____ iminyaka ☐☐ 22

UCANDELO 1

Iphepha lemibuzo iqalisa malunga nezinto ozenzayo okanye (ongazenziyo) onokonakalisa ukhuselo lomzimba.

1. Uyakwazi ukuqubha?

HAYI ☐

EWE ☐ ☐ 23

2. Ubukhe waqubha kwezinyanga ziyi 12 zidlulileyo?

HAYI ☐

EWE ☐ ☐

UKUBA EWE:

a. Zange ukhe ufumane amava amaza angamandla emanzini kwezinyanga ziyi 12 zidlulileyo?

HAYI ☐

EWE ☐ ☐

b. Zange ukhe untywile emanzini ongaqinisekanga ngobundzulu bawo kwezinyanga ziyi 12 zidlulileyo (ngaphandle kwescuba diving)?

HAYI ☐

EWE ☐ ☐ 26

3. Kwezinyanga ziyi 12 zidlulileyo ubukhe wakhwela isitututu okanye isikuta ukhwelisiwe okanye uqhuba?

HAYI ☐

EWE ☐ ☐ 27

UKUBA EWE:

Kwezinyanga ziyi 12 zidlulileyo ubukhe waqhuba ngaphandle kwesigcini ntloko?

HAYI ☐

EWE ☐ ☐

4. Kwezinyanga ziyi 12 zidlulileyo ubukhe waba sengozini uhamba ngezithuthi?

HAYI ☐

EWE ☐ ☐

5. Kwezinyanga ziyi 12 zidlulileyo ubukhe wonzakaliswa ngezithuthi, isitututu okanye ibhisikile uhamba okanye umile?

HAYI ☐

EWE ☐ ☐ 30

6. Kwezinyanga ziyi 12 zidlulileyo ubukhe wahlala kwisitulo esingaphambili esithuthwini (ipasenjani)?

HAYI ☐

EWE ☐ ☐ 31

UKUBA EWE:

Kwelilixa lokugqibela uhamba ngesithuthi uhleli kwisitulo esingaphambili (ipasenjani) sasikhona na isibophi sesitulo esikhoyo?

HAYI ☐

EWE ☐

ANDAZI ☐ ☐

Ukuba ewe wawusiqhoboshile esisibophi sesitulo lonke uhambo.

HAYI ☐

EWE ☐ ☐

7. Ucinga ukubopha isibophi sesitulo kukusindisa emngciphekweni wokonzakala?

HAYI ☐

EWE ☐

NDIQINISEKANGA ☐ ☐ 34

8. Ubukhe wahamba ngesithuthi kwezinyanga ziyi 12 zidlulileyo?

HAYI ☐

EWE ☐ ☐ 35

UKUBA EWE:

Kwezinyanga ziyi 12 zidlulileyo ubuke wahamba ngesithuthi wazi okanye ukrokrela ngamandla ukuba.

a. Isithuthi besixinene

HAYI ☐

EWE ☐ ☐

b. Ngesithuthi esingalungelanga ukusetyenziswa esitratweni okanye kungakhuselekanga ukuyiqhuba?

HAYI ☐

EWE ☐ ☐

c. Umqhubi akanamaphepha okuqhuba?

HAYI ☐

EWE ☐ ☐

d. Umqhubi uchukumise/wonakaliswe butywala okanye yintsango.

HAYI ☐

EWE ☐ ☐ 39

9. Wakhe waqhuba isithuthi kwindlela kawonke-wonke?

HAYI ☐

EWE ☐ ☐ 40

UKUBA EWE:

Wakhe waqhuba isithuthi kwezinyanga ziyi 12 zidlulileyo?

a. Isithuthi esixineneyo

HAYI ☐

EWE ☐

UNGAQINISEKANGA ☐ ☐

b. Isithuthi esingalungelanga ukusetyenziswa esitratweni?

HAYI ☐

EWE ☐

UNGAQINISEKANGA ☐ ☐

c. Ngaphandle kwamaphepha okuqhuba?

HAYI ☐

EWE ☐ ☐

d. Uchukumise/wonakaliswe butywala okanye intsango?

HAYI ☐

EWE ☐ ☐ 44

Kulemibuzo imbalwa ilandelayo sizama ukukhangela ukuba bukukhathaza kangakanani ubugebenga ngokubanzi.

10. Kwezinyanga ziyi 12 zidlulileyo esikolweni

a. Ubukhe wonzakaliswa emzimbeni ngomnye umfundi?

HAYI ☐

EWE ☐ ☐ 45

b. Ubukhe wonzakaliswa emzimbeni ngomnye wabaqeshwa-isitafu (Ngaphandle kokohlwayo emzimbeni)

HAYI ☐

EWE ☐ ☐

c. Ubukhe wonzakalisa emzimbeni omnye umfundi?

HAYI ☐

EWE ☐ ☐

d. Wakhe wakhuthuzwa?

HAYI ☐

EWE ☐ ☐

e. Ukhe wenza umonakalo ongamandla kwisakhiwo?

HAYI ☐

EWE ☐ ☐ 49

10. Kwezinyanga ziyi zidlulileyo esikolweni

f. Wakhe wakhathazwa ngesini ngomnye umfundi?

HAYI ☐

EWE ☐ ☐ 50

g. Wakhe wahlutshwa ngesini lelinye ilungu lezisebenzi okanye ngomnye umsebenzi ?

HAYI ☐

EWE ☐ ☐

11. Kwezinyanga ziyi 12 zidlulileyo ekhaya

a. Ubukhe wonzakaliswa emzimbeni ngumntu omdala?

HAYI ☐

EWE ☐ ☐

b. Wakhewe hlelwa kukukhathazwa ngesini?

HAYI ☐

EWE ☐ ☐ 53

12. Kwezinyanga ziyi 12 zidlulileyo ngaphandle kwekhaya okanye kwesikolo.

a. Ubukhe wonzakaliswa emzimbeni ngumntu?

HAYI ☐

EWE ☐ ☐ 54

b. Ukhe wonzakalisa emzimbeni umntu?

HAYI ☐

EWE ☐ ☐

c. Ukhe wenza umonakalo ongamandla kwisakhiwo

HAYI ☐

EWE ☐ ☐

d. Wakhewe hlelwa kukukhathazwa ngesini?

HAYI ☐

EWE ☐ ☐ 57

13. Kweziveki ziyi 4 zidlulileyo ubukhe waphatha imela uzakuyisebenzisa njengesikhali?

HAYI ☐

EWE ☐ ☐

UKUBA EWE:

Ubusoloko uyiphatha imela?

HAYI ☐

EWE ☐ ☐ 59

14. Kweziveki ziyi 4 zidlulileyo ubukhe wapha tha naluphi uhlobo lesikhali okanye izikhali?

HAYI ☐

EWE ☐ ☐ 60

UKUBA EWE:

Ubusoloko uphatha esinye sezizikhali?

HAYI ☐

EWE ☐ ☐

Ibisesiphi isikhali okanye izikhali? _____ ☐☐☐

_____

15. Kweziveki ziyi 4 zidlulileyo ubukhe waphuma ngaphandle ngaphesheya ebumelwaneni ebusuku ungayazi ukuba uzogoduka njani?

HAYI ☐

EWE ☐ ☐

16. Kweziveki ziyi 4 zidlulileyo ubukhe waphuma ngaphandle kobumelwane ebusuku uhamba wedwa ukugoduka?

HAYI ☐

EWE ☐ ☐

17. Kweziveki ziyi 4 zidlulileyo ubukhe waphuma ngaphandle ngaphesheya ebumelwaneni ebusuku wacela ukukhweliswa ngabahambi ngendlela ukubuya?

HAYI ☐

EWE ☐ ☐ 67

Lemibuzo iyi 3 yokugqibela kwelicandelo inento nokwenza nembonakalo ezithile zokuzonzakalisa.

18. Kwezinyanga ziyi 12 zidlulileyo ubukhe wacinga ndzulu ngokuzondzakalisa kangangokuba ude ufune ukuzibulala?

HAYI ☐

EWE ☐ ☐ 68

19. Kwezinyanga ziyi 12 zidlulileyo ubukhe waxelela ubani/umntu ukuba uzimisele ukubuphelisa ubomi bakho?

HAYI ☐

EWE ☐ ☐

20. Kwezinyanga ziyi 12 zidlulileyo ngokwenene ubukhe wazama ukubuphelisa ubomi bakho?

HAYI ☐

EWE ☐ ☐ 70

UCANDELO 2

Lamacandelo ayi 3 kweliphepha mibuzo mafutshane kuneli lokuqala ucandelo. Elicandelo linxulumene nosetyenziso lwecuba nezinye i ntlobo zezinto ezinakho ukonakalisa impilo yakho.

1. Okona kuncinci uyawutshaya umdiza omnye ngemini?

HAYI ☐

EWE ☐ ☐ 71

UKUBA EWE:

Ubukhe wazama ukuyeka?

HAYI ☐

EWE ☐ ☐

UKUBA HAYI:

Wakhe watshaya?

HAYI ☐

EWE ☐ ☐

Uzimisele ukuqalisa ukutshaya?

HAYI ☐

EWE ☐ ☐ 74

2. Wakhe wasebenzisa ipilisi,umgubo okanye iyeza ukwenzela intlungu? (umzekelo iPanado)

HAYI ☐

EWE ☐ ☐ 75

UKUBA EWE:

Uzisebenzise kangaphi kwezintsuku ziy 7 zidlulileyo? _____ ☐☐☐ 78

Uzisebenzise kangaphi kweziveki zi 4 zidlulileyo? _____ New card ☐☐☐ 1 3

Sesiphi isizathu esikubangele ukuba usebenzise ipilisi, umgubo okanye iyeza? _____ ☐

_____

3. Wakhe wayitshaya intsango nje yodwa?

HAYI ☐

EWE ☐ ☐

UKUBA EWE:

Uyitshaye kangaphi intsangu nje yodwa kwezintsuku zi 7 zidlulileyo? _____ ☐☐☐

Uyitshaye kangaphi intsangu nje yodwa kweziveki ziyi4 zidlulileyo? _____ ☐☐☐ 13

4. Wakhe wayitshaya intsangu ne mandrax zidibene?

HAYI ☐

EWE ☐ ☐ 14

UKUBA EWE:

Uzitshaye kangaphi intsangu nemandrax zidibene kwezintsuku zi 7 zidlulileyo?

_____ ☐☐☐ 2

Uzitshaye kangaphi intsangu nemandrax zidibene kweziveki ziyi 4 zidlulileyo?

_____ ☐☐☐

5. Wakhe wazibizela iglu, ipetroli okanye ithinasi?

HAYI ☐

EWE ☐ ☐

UKUBA EWE:

Ubukhe wazibizela kangaphi iglu,ipetroli okanye ithinasi kwezintsuku ziyi 7 zidlulileyo?

_____ ☐☐☐

Ubukhe wazibizela kangaphi iglu,ipetroli okanye ithinasi kweziveki ziyi 4 zidlulileyo?

_____ ☐☐☐ 2

6. Wakhe wazisebenzisa ilova 25 ?

HAYI ☐

EWE ☐ ☐ 28

UKUBA EWE:

Wakhe wazisebenzisa kangaphi ilova 25 kwezintsuku ziyi 7 zidlulileyo?

_____ ☐☐☐

Wakhe wazisebenzisa kangaphi ilova 25 kweziveki ziyi 4 zidlulileyo?

_____ ☐☐☐ 34

7. Wakhe wasebenzisa iziyobisi zesitofu?

HAYI ☐

EWE ☐ ☐

UKUBA EWE:

Uzisebenzise kangaphi iziyobisi zesitofu kwezintsuku ziyi 7 zidlulileyo?

_____ ☐☐☐

Uzisebenzise kangaphi iziyobisi zesitofu kweziveki ziyi 4 zidlulileyo?

_____ ☐☐☐ 41

8. Wakhe wasebenzisa naluphi olunye uhlobo lwesiyobisi?

HAYI ☐

EWE ☐ ☐ 42

UKUBA EWE:

Nceda unike igama lezinye iziyobisi owakhe wazisebenzisa.

_____

_____

_____

_____ ☐☐☐

_____ ☐☐☐ 4

9. Wakhe wabusela utywala ezifana nebiya,newayini?

HAYI ☐

EWE ☐ ☐

UKUBA EWE:

Ngamaxesha amangaphi usebenzisa utywala kwezintsuku ziyi 7 zidlulileyo?

_____ ☐☐☐

Ngamaxesha amangaphi usebenzisa utywala kweziveki ziyi 4 zidlulileyo?

_____ ☐☐☐

Ngamaxesha amangaphi okhe wafumana iziselo ezi 5 okanye ngaphezulu ngelixa elinye kwezintsuku ziyi 14 zidlulileyo?

_____ ☐☐☐ 5

UCANDELO 3

Enkosi kakhulu ngoku phendula lemibuzo ukuzothi ga. Singayixabisa ukuba unokuphendula lemibuzo yokugqibela imbalwa enxulumene nokulala kwendoda nomfazi nangona siyiqonda ukuba abanye abafundi bazoba nentloni ngeminye yemibuzo, ibalulekile kuthi ukuba sibenalo olulwazi ukuze sicebe inkqubo yokukhusela izifo ezithile (umzekelo Aids) nomitho lolutsha.

1. Wakhe walala nomntu okwisini esingafaniyo nesakho? Lento ithetha ubuqabane nomntu ongesosini sakho, apho incanca ingena ekukwini (indawo zangasese zebhinqa)

HAYI ☐

EWE ☐ ☐ 59

Ukuba hayi- Ndoda: Nceda uye kumbuzo 6 iphepha 21

Ibhinqa: Nceda uye kwicandelo 4 iphepha 23

Ukuba ewe: Nceda utyile iphepha uphendule lemibuzo ilandelayo mihlanu

2. Lixesha elingakanani wagqibela ukungenwa ekukwini?

_____ ☐☐☐ 6

NGELOTHUBA:

Lalingakanani ubudala iqabane lakho?

_____ iminyaka? ☐☐

Ubulazi iqabane lakho ngaphezu kwentsuku ezi 7?

HAYI ☐

EWE ☐ ☐

Wena okanye iqabane lakho nakhe nenza okanye nasebenzisa into yokukhusela umitho (cwangcwisa)?

HAYI ☐

EWE ☐

ANDAZI ☐ ☐ 66

Ukuba ewe wena okanye iqabane nikhe nisebenzise ntoni? (khomba noba zingaphezu kwesinye ukuba kuyimfuneko)

Isingxobo (condom) ☐ ☐

Injekitshini ☐ ☐

Ipilisi yocwangcwiso (bandakanya idaena) ☐ ☐

Ikapu okanye idiyafram ☐ ☐

Ijeli okanye igwebu. ☐ ☐

Iluphu/songololo ☐ ☐

Ukukroxa ☐ ☐

"Ixesha elikhuselekileyo" okanye ucwangcwiso lwekhalenda. ☐ ☐ 74

3. Waqalwa unangaphi ukungenwa ekukwini

_____ iminyaka ☐☐ 76

4. Kwezinyanga ziyi 12 zidlulileyo mangaphi amaqabane akulale ngokukungena ekukwini?

_____ ☐☐☐

5. Wakhe wathambekela ekulaleni nesini esingafaniyo nesakho apho incanca ingena ezimpundwini. (umngxunya ongemva)

HAYI ☐

EWE ☐ ☐ 80

Amabhinqa: **nceda niye kwicandelo 4 (iphepha 23)**

Amadoda: **nceda nityile iphepha niqhubeke.**

LEMDAWO IBHALA NGAMADODA ODWA

6. Wakhe walalana nenye indoda ngempundu lento ithetha ukunxulumelana nenye indoda apho incanca ingena ezimpundwini (umngxunya ongasemva)?

HAYI ☐

EWE ☐

New card

☐ 1

Ukuba hayi, nceda uye kwicandelo 4 (iphepha 23)

Ukuba ewe: **nceda utyile uphendule lemibuzo miyi 3 yokugqibela.**

7. Wagqibela nini ukulalana nenye indoda ngempundu?

_____ ☐☐☐ 4

NGELOTHUBA:

Lalingakanani ubudala iqabane lakho?

_____ iminyaka ☐☐

Iqabane lakho ubulazi ngaphezu kwentsuku eziyi 7 ?

HAYI ☐

EWE ☐ ☐

Wena okanye iqabane lakho nasebenzisa isingxobo na?

HAYI ☐

EWE ☐ ☐ 8

8. Waqala unangaphi ukulalana nenye indoda ngempundu?

_____ iminyaka ☐☐

9. Mangaphi amadoda olalane nawo ngempundu kwezinyanga ziyi 12 zidlulileyo?

_____ ☐☐☐ 13

UCANDELO 4

Nceda usebenzise lendawo ingezantsi ukwenza izimvo ozinqwenelayo.

ENKOSI KAKHULU NGOKUSEBENZISANA!

Appendix 2

Appendix 2

SCHOOLS IN EACH STRATUM

1. House of Assembly

Stratum A: Low index of level of living

1. Belleview 3,9
2. Belleville 4,28
3. Camps Bay 3,92
4. DF Malan 3,9
5. Durbanville 2.04
6. Edgemead 0,54
7. Fairmont 2,04
8. Groote Schuur 2.52
9. Milnerton 3,72
10. Oude Molan 3,72
11. Pinelands 3,72
12. President 3,23
13. SA College School (SACS) 2,52
14. Sans Souci 2,52
15. Settlers 3,9
16. Stellenberg 1,52
17. Table View 0,00

Stratum B: Intermediate index of level of living

1. Bergvliet 4.07
2. Bosmansdam 5,44
3. Brackenfell 4,26
4. Cape Town High 6.06
5. De Kuilen 4,95
6. Fish Hoek High 5.13
7. Fish Hoek Middle 5.13
8. Kenilworth 4,87

9. Monument Park 4,48
10. Rhodes 8.03
11. Rondebosch 4.05
12. Rustenberg 4,05
13. Sea Point 7.73
14. Simonstown 5,17
15. Thornton 5,8
16. Westerford 4.05
17. Zwaanswyk 5,71

Stratum C: High index of level of living

1. De Ruyter 8.91
2. Eben Donges 9,90
3. Fairbairn 8.91
4. Gardens Commercial 12,63
5. Good Hope 20,64
6. Jan van Riebeeck 20,64
7. JG Meiring 8.91
8. JJ Du Preez 9,39
9. Maitland 28,45
10. Muizenberg 15,3
11. Tygerberg 9,39
12. Tygerberg Commercial 14,29
13. Woodstock 26.01
14. Wynberg Boys' 29,95
15. Wynberg Girls' 29.95
16. Ysterplaat 20,29

2. House of Representatives

Stratum A: Low dependency ratio

1. Alexander Sinton
2. Belgravia
3. Belleville South
4. Bridgetown
5. Crestway
6. Garlendale
7. Harold Cressy
8. Heathfield
9. Heideveld

10. Kasselsvlei
11. Kensington
12. Livingstone
13. Oaklands
14. Peaksview
15. Range
16. Sentinal
17. Sibelius
18. South Peninsula
19. Spes Bona
20. St. Columbus
21. Steenberg
22. Trafalgar
23. Vista
24. Walmer
25. Zeekoevlei

Stratum B: Intermediate dependency ratio

1. Arcadia
2. Benodino Heights
3. Bonteheuwel
4. Fairmount
5. Florida
6. Grassdale
7. Grassy Park
8. Groenvlei
9. Immaculata
10. John Ramsay
11. Lavender Hill
12. Lotus
13. Manenberg
14. Moddersdam
15. Phoenix
16. Ravensmead
17. Salt River
18. Serepta
19. Silverstream
20. Silverstream
21. Strandfontein
22. Uitsig
23. Valhalla
24. Wittebome
25. Wynberg

Stratum C: High dependency ratio

1. Aloe
2. Beacon Hill
3. Beawalboom
4. Belhar
5. Cedar
6. Crystal
7. Elmswood
8. Elsies River
9. Excelsior
10. Glendale
11. Kleinvlei
12. Lentegeur
13. Macassar
14. Mountview
15. Ocean View
16. Portland
17. Princeton
18. Rocklands
19. Scotsdene
20. Scottsville
21. Spine Road
22. Symphony Road
23. Tafelsig
24. Westridge
25. Woodlands

3. Department of Education and Training

Stratum 1: Schools in the settled urban communities of Langa, Gugulethu, and Nyanga

1. Idkize (Gugulethu)
2. Ingshukumo (Gugulethu)
3. Isimela (Langa)
4. Lagunya (Langa)
5. Langa (Langa)
6. Sezeka (Gugulethu)
7. Sizamile (Nyanga)

Stratum 2: Schools in the more resently established areas of New and Old Crossroads and Khayalitsha

1. Luhlaza (Block E)
2. Malizo (Site B)
3. Masile (Site B)
4. Mvuzememvuze (C-section)
5. No. 3 (New Crossroads)
6. Sebenza (Old Crossroads)

Appendix 3

HEALTH - RELATED BEHAVIOUR OF CAPE TOWN HIGH SCHOOL STUDENTS: A RESEARCH PROPOSAL

ALAN J. FLISHER

26 March 1990

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Dr Alan J. Flisher

1. INTRODUCTION AND RATIONALE

The period of transition from childhood to adulthood, *viz.* adolescence, has not attracted a great deal of attention in the discipline of public health. The fact that adolescents comprise a relatively healthy section of the population and the tendency of health professionals to focus their attention on the enormous amount of preventable pathology from infectious diseases in the younger age groups contribute to this state of affairs (Friedman, 1985). There are however several compelling reasons for redressing this imbalance.

Firstly, adolescents constitute a significant proportion of the population. For the purposes of this proposal, we shall adhere to the definition of adolescence that has been adopted by the World Health Organisation, i.e. all people between the ages of 10 and 19 (Friedman, 1989); although this definition has obvious shortcomings, these are outweighed by the advantages of conforming to the WHO criteria. Table I gives an indication of the numbers of adolescents in South Africa in 1990 and 2000 projected from 1985 census data. It can be seen that about 22% of the South African population are adolescents, and that this proportion is not likely to decrease significantly in the next decade.

Secondly, much of the mortality in adolescents is preventable. Table 2 provides the proportions of all adolescent deaths in South Africa in 1984-1986 due to the major causes. It can be seen that 56,81% of these deaths were due to non-natural causes; almost all of these have the potential to be prevented. Furthermore, the next highest cause of death is infectious and parasitic diseases; for Africans in the 10-14 year age group this accounts for 14,5 % of all deaths (Flisher *et al.*, unpublished).

Thirdly, the life styles of adolescents involve a greater degree of risk-taking behaviour, experimentation and rebellion than those of other age groups (WHO, 1986). Clearly, this is necessary for optimal psychological development. However, there is the potential for negative impact on the adolescent's well being, as exemplified by assault, traffic accidents and substance abuse. The effects of certain adolescent behaviour may only become manifest after adolescence; the example par excellence in this regard is sexual activities that may result in HIV infection and the subsequent development of AIDS (King *et al.*, 1989).

Fourthly, adolescents are particularly influenced by social factors as they attempt to develop a sense of identity (Eriksen, 1956). Adolescence is thus a critical period for the acquisition of health promoting behaviour and attitudes in that their effects are multiplied by persisting throughout adulthood. This attains increased importance in the light of the fact that the solutions to many of the most pressing public health problems require attention to be given to lifestyle factors (Sachdev, 1990; Seager, unpublished; Winett *et al.*, 1989).

Fifthly, the environment in which adolescents live is in many cases very different to that to which their parents were exposed. Political and economic changes, migration, urbanization (Harpham *et al.*, 1988) and a diminution of the influence of the extended family all contribute to this. Adolescents are thus confronted not only with their personal developmental tasks but also with societal changes; health damaging behaviour such as alcohol abuse is a likely consequence of this scenario (Friedman, 1989).

Finally, the implication of much of the above discussion that the overwhelming majority of the morbidity and mortality of adolescents is due

to lifestyle and behavioural factors, combined with the fact that large numbers of adolescents congregate in schools, implies that there is the potential for the implementation of efficient community health promotion efforts in schools. Although there have been some pilot studies with encouraging results (e.g. Hunter *et al.*, in press), health education has tended to receive a low priority by South African education authorities (Seager, unpublished; Yach, Pick and Padayachee, in press). Despite the fact that educational programmes in the United States have not been as successful in influencing behaviour as they have in providing information and altering attitudes (Bartlett, 1981), the development of appropriate intervention strategies for South African school students is long overdue. Clearly, this enterprise will require contributions from the disciplines of both health psychology and public health (Winett *et al.*, 1989).

As an initial step in intervening in this terrain, it is necessary to have some estimates of the prevalence of adolescent risk taking behaviours. Two large scale overseas studies have attempted to address this need; one is being conducted by the WHO and involves 12 European countries (Nutbeam *et al.*, 1989) while the other was co-ordinated by the National School Health Association in the U.S.A. (National School Health Association, 1989). There are as yet no similar studies in South Africa, although there are a number of reports that are concerned with adolescent health related behaviour in specific areas. The proposed project was motivated by the necessity of gathering information regarding the prevalence of health related behaviours in adolescents attending non private high schools in the Cape Peninsula. We intended to distribute a questionnaire eliciting information regarding: (a) behaviour leading to physical trauma (including suicide behaviour); (b) substance abuse (tobacco, drugs and alcohol); and (c) sexual behaviour. Brief rationales for each of these dimensions will now be presented.

Behaviour leading to physical trauma

The high proportion of all South African adolescent deaths that can be ascribed to nonnatural causes has already been mentioned. Analyses of these deaths by age group and sex and by age group and statutory group are presented in tables 3 and 4 respectively.

Table 3. *Analysis of all non-natural deaths in South Africa (excluding Transkei, Ciskei, Venda, and Bophuthatswana) in 1984-1986 by age and gender (Flisher et al.., 1990)*

	10 - 14 years				15 - 19 years			
	Male		Female		Male		Female	
	N	%	N	%	N	%	N	%
Road	538	31,0	301	39,7	1 246	22,7	381	29,2
Drowning	391	22,6	160	21,1	378	6,9	114	8,7
Undetermined	253	14,6	110	14,5	808	14,7	241	18,5
Assault	203	11,7	54	7,1	2 288	41,6	270	20,7
Suicide	51	2,9	13	1,7	241	4,4	104	8,0
Other	297	17,1	120	15,9	533	9,6	193	14,7
TOTAL	1 733	100,0	758	100,0	5 494	100,0	1 303	100,0

Table 3. Analysis of all non-natural deaths in South Africa (excluding Transkei, Ciskei, Venda, and Bophuthatswana) in 1984-1986 by age and statutory group (Flisher et al.., 1990)

	10 - 14 years							
	Whites		Coloureds		Asians		Blacks	
	N	%	N	%	N	%	N	%
Road	166	52,2	182	39,5	33	41,8	469	28,7
Drowning	20	6,3	116	25,2	10	12,7	395	24,2
Undetermined	37	11,6	51	11,1	21	26,6	255	15,6
Assault	24	7,5	43	9,3	5	6,3	184	11,3
Suicide	29	9,1	9	2,0	4	5,1	21	1,3
Other	42	13,2	60	13,1	6	7,6	309	18,9
TOTAL	318	100,0	461	100,0	79	100,0	1 633	100,0

	15 - 19 years							
	Whites		Coloureds		Asians		Blacks	
	N	%	N	%	N	%	N	%
Road	630	55,9	298	22,0	65	31,3	665	16,2
Drowning	47	4,2	132	9,7	26	12,5	259	6,3
Undetermined	151	13,4	149	11,0	35	16,8	714	17,4
Assault	67	5,9	639	47,1	30	14,4	1 810	44,1
Suicide	148	13,1	35	2,6	34	16,3	127	3,1
Other	85	7,5	103	7,6	18	8,7	517	12,6
TOTAL	1 128	100,0	1 356	100,0	208	100,0	4 105*	100,0

* Total not arithmetically correct owing to rounding-off

It can be deduced from tables 3 and 4 that road accidents, drowning, assault and suicide account for at least 66% of the nonnatural deaths in each age group/sex and age group/statutory group category, although the rank order varies with each category. Mortality data only account for an extreme outcome from a traumatic event; the extent of non fatal "accidents" and injuries is reflected in the fact that 3 452 people between the ages of 10 and 19 were seen in the Groote Schuur Hospital trauma unit in 1989 whereas only 7 died (Knottenbelt, personal communication, 1990). By making several assumptions one can conclude that the average total number of injuries experienced by adolescents per year for the period 1984-1986 was about 1,5 million! The extent of the psychological component to the events resulting in a physically traumatic event is perhaps least striking in the case of road "accidents" but even here Gray (1983) has calculated using an unspecified methodology that the behaviour of the road user contributes to 95 % of road "accidents".

Most of the work dealing with the psychological aspects of trauma have used as their sampling frame individuals who either die or who come into contact with a help giving facility after the injury. The two large scale studies that have been mentioned above notwithstanding, there has not been much attention in the world literature devoted to behaviour in the population at large that may culminate in a traumatic event; an exception is that of suicidal behaviour (Iga, 1981; Inamura, 1977; Ladame and Jeanneret,1982; and Stork, 1977). The proposed survey would provide sorely needed local data regarding the behaviour of high school students in Cape Peninsula with regard to physical trauma.

Substance abuse

Cigarette smoking

The overwhelming deleterious effects of smoking on the health of South Africans has been documented (Yach and Joubert, 1988). Although prevalence studies describing smoking behaviour among Cape Peninsula school students have been carried out, their conclusions are limited by (a) their being restricted to one population group (Prout and Benatar, 1982; Strebel *et al.*, 1989; van Wyk, 1985) or to younger (Benatar, 1979; Strebel *et al.* 1989) or older (Disler *et al.*, in press) adolescents; (b) non representative samples (Benatar, 1979); and (c) poor response rates (Benatar, 1979). Disler *et al.* (in press) were not able to provide the name of the school in which they conducted their study as this was precluded by the permission contract and they provide no information regarding the characteristics of the school other than to state that it was a "large coeducational high school in metropolitan Cape Town". Furthermore, there are some important differences in the findings from the various studies; for example, Strebel *et al.* (1989) found that it was rare for black girls at higher primary schools to smoke whereas this was not the case in the other reports cited above. The need for up to date and reliable data is thus obvious.

Drugs

There have been several reports of non clinic-based studies describing the prevalence of illicit drug use by subgroups of South African adolescents. Most of these are not relevant for this study as they are limited to populations of : (a) university

students (Ben-Arie, 1984; Herr and Morley, 1972; Levine *et al.*, 1983; and Simon, 1982); (b) white adolescents who had left school (Van der Burgh, 1974); or (c) a poorly defined group of Indian teenagers (Millar, 1974). Only two studies have attempted to gain an impression of the prevalence of drug abuse in a school population; the first was carried out in Durban more than a decade ago (Du Toit, 1978 - cited in Ben-Arie, 1984), while the second was by peformed by Disler *et al.* (in press) and was part of the same study cited above in relation to smoking and thus has the same limitations. All these studies conclude that the overwhelming majority of adolescents using illicit drugs restrict their intake to cannabis and/or methaqualone (Mandrax). This is consistent with the summary data provided by the Cape Town Drug Counselling Centre for 1988-1989; it was reported that only 8 % of the clients referred to the centre have abused drugs other than cannabis and/or methaqualone. It has been suggested that the distance from the main world centres, strict drug laws and relatively small potential market contribute to this state of affairs (Ben Arie, 1984). Clinical impressions have suggested that this pattern may be altering, possibly as a consequence of recent illicit drug policing iniatives in the U.S.A. and certain South American states. Clinical data have also indicated that sniffing of solvents may be more prevalent than commonly thought; this could have widespread repercussions in the light of the adverse neuro-psychological signs that could ensue (Chadwick *et al.*, 1989), and it was thus decided to include an item on this phenomenon in the questionnaire. The item on parenteral administration of drugs was motivated by the obvious implications of this for the epidemiology of HIV infection. The question on analgesic abuse was justified by the high

incidence of analgesic nephropathy as a cause of chronic renal failure; 10-12 % of all patients accepted onto the Groote Schuur Hospital renal dialysis/transplantation programme are analgesic nephropaths (Pascoe, personal communication, 1990).

Alcohol

There is an absence of local data regarding the drinking pattern of adolescents and its relationships to the various causes of physical trauma. Again, only two relevant studies were unearthed; the first concerned an inadequately defined sample of Natal Indians aged 15 years and older and was conducted in 1963 (Miller, 1974), while the second was the same study by Disler et al (in press) that has been referred to on two occasions above.

Sexual behaviour

Internationally, there is a secular trend towards a lowering of the age of menarche (Friedman, 1985). Since younger ages of menarche are associated with younger ages of first intercourse (De Groot and Greathead, 1987), and since there is a trend towards later marriage (Friedman, 1985), there is a greater risk of unprotected intercourse taking place. This has several implications for public health; one of these is unplanned adolescent pregnancies, the consequences of which have been recently comprehensively reviewed in the local context by Nash (1990). There is no convincing evidence (especially for older adolescents) that adolescent pregnancies are more obstetrically problematical than other primigravid pregnancies when there has been control for the relevant confounding variables (Hofmann, 1984). There is however convincing evidence of adverse psychological, social and

economic sequelae of teenage pregnancy that affect both the mother and the child and, in many cases, other family members as well (WHO, 1986). Even if the teenager is able to choose to have the pregnancy terminated, she is unlikely to be free of subsequent psychological distress (Nash, 1990). High rates of teenage pregnancy have been reported both internationally (Kymen *et al.*, 1987) and in South Africa (de Groot, 1986; de Groot *et al.* 1985; de Villiers, 1985; Roberts and Rip, 1984). Roberts and Rip (1984) reported that 49 % of women in their study of women in Cape Town and Ciskei had had their first pregnancy by the age of 20 years.

It is however the AIDS epidemic that has added an urgency to the acquiring of information regarding sexual practises. Although only 4 adolescents with AIDS had been reported by 20 September 1989 and they were all haemophiliacs (Friedman and Robertson, in press), the prevalence of HIV infection in South African adolescents is not known. Some insight into the extent of the epidemic can be gained from the estimation that the doubling time for HIV infection among black South Africans is 8,5 months and that there will be between 119 000 and 168 000 HIV infected black South Africans between the ages of 15 and 49 years in South Africa by the end of 1990 (Padayachee and Schall, in press). There are two principle HIV related uses to which data regarding adolescent sexual behaviour can be put: (a) constructing mathematical models to predict the spread of infection (Bowie and Ford, 1989); and (b) planning educational interventions.

There is however a dearth of information regarding sexual behaviour both internationally (Brooks-Gunn and Furstenberg, 1989) and locally (De Groot and Greathead, 1987), although two studies involving pregnancy in black adolescents are currently being planned (No author, unpublished;

Verburgh, unpublished). De Groot and Greathead (1987) studied certain aspects of sexual behaviour of white attenders at a teenage clinic run by a family planning association; it is obviously inappropriate to extrapolate their findings to teenagers in the general population. Mathews *et al.* (unpublished) report that 75,4 % of their sample of African high school attenders with a median age of 17 years had had sexual intercourse and they provide some information regarding the number of partners that they have had. Again, there are problems of generalisability; furthermore, they comment that it is not known what the students interpretation of "sexual activity" was.

In conclusion, attempts to intervene in preventing the unwanted consequences of unprotected sexual intercourse will (at best) not achieve their potential in the absence of basic relevant behavioural data.

This project is one of several being undertaken involving the psychological and epidemiological aspects of adolescence by individuals associated with, *inter alia*, the UCT Department of Psychiatry and/or CERSA. Other work includes:

- a cross sectional and longitudinal analysis of mortality data for South African adolescents (a draft article dealing with this aspect is currently being prepared);

- a community based survey using the questionnaire to be described below in order to gather data regarding adolescents who are of high school attending age but who do not in fact attend high school - particularly important groups in this regard are: (i) teenagers that have left school before

completing their senior certificate; and (ii) students that attend primary schools despite being of high school attending age (a protocol meeting will be held shortly at CERSA when this project will discussed);

- a more intensive investigation in terms of aetiology, social context and management of a group of adolescents found to be at risk for serious psychological problems or psychiatric disorder (this is currently in the planning stages);

- the collection of routinely available data regarding various aspects of adolescent morbidity and mortality - sources include : the trauma units at Groote Schuur and Red Cross hospitals, the Drug Counselling Centre, and the Narcotics Squad of the S A Police (in progress); and

- a more intensive analysis of certain of the health related behaviours studied in this project. It is realised that much of the data to be obtained in this project will be somewhat crude; however this is justified by the paucity and poor quality of currently available information. Aspects that deserve further consideration include the determinants, social context and personal meaning associated with the various forms of behaviour. Of course, the ultimate goal is interventional studies.

2. AIMS AND OBJECTIVES

2.1 Aim

To gather data regarding the prevalence and determinants of certain aspects of health related behaviour in students attending non- private high schools in the Cape Peninsula. The specific areas to be investigated are:

- behaviour leading to physical trauma (including suicidal behaviour);

- substance abuse, *viz.*

  smoking

  alcohol

  drugs; and

- sexual behaviour.

2,2 Objectives

- To draw up a questionnaire eliciting the behaviour referred to above.

- To conduct a school based survey thereby eliciting responses to the questionnaire from a representative sample of non-private high school attenders in the Cape Peninsula.

- To describe the prevalence of the behaviours referred to above both for the sample as a whole and in terms of certain demographic features.

- To examine the determinants of certain key behaviours in terms of demographic features and other health related behaviours.

3. METHOD

3.1 Study type

The proposed study is a cross-sectional descriptive study with an analytical component.

3.2 Instrument

The proposed questionnaire is provided in Appendix A. This was constructed following: (i) literature reviews in the various content areas; (ii) consultation with local experts; and (iii) long and detailed discussions between the investigators. The emphasis is on specific observable risk taking behaviours; attitudes, beliefs and other intra-psychic phenomena were not investigated as it was felt that the results would be less likely to be skewed by intervening cultural and linguistic variables. The questionnaire will be translated into Afrikaans and Xhosa and then back translated. It is a self-administered instrument and takes approximately

20 minutes to complete. See (d) below for information regarding the proposed pilot studies.

3.3 Study population

The study population consists of all students attending non-private high schools in the Cape Peninsula. The Cape Peninsula was defined as the 01 economic region. Students attending private schools (including private colleges) were excluded from the study for the following reasons: (a) they comprise a relatively small proportion of the total number of high school students in the Cape Peninsula (about 3 000 out of a total of about 125 000); (b) it would be difficult to obtain a representative sample in the light of the relatively large number (about 20) and religious, language and pedagogical diversity of the schools; and (c) intervention programmes would be organised and implemented through the various state education departments and information regarding private schools is thus not directly applicable. Special schools were excluded from the study population as a different methodology would be required to account for the particular circumstances pertaining to this group. Technical schools were included in the sampling frame along with the other schools.

A stratified random sampling procedure will be used to draw a representative sample of the study population. The total sample size will be of the order of 10 000. See appendix B for a list of all schools included in the sampling frame. The schools fall under 4 education departments as follows: Department of Education and Training (DET) (15 600 students in 13 schools); House of Assembly (HoA) (34 450 students in 53 schools); House of Delegates (HoD) (2 300 students in 3 schools); and House of Representatives (HoR) (64 800 students in 54 schools). The number of

students from each department selected for the sample not necessarilly be proportional to the total number of students in each division. Where not all students in a school are included in the sample, a representative sample will be selected. The methods employed to draw this sample will vary from school to school and will be decided after the schools have been selected; it is however most likely that the schools would be clustered by class. In the cases of the HoA and HoR, the schools have been stratified according to social class; this is justified by the observation that social class is an important determinant of a variety of risk-taking behaviours (Sachdev, 1990). Sampling methods for each of the education departments are as follows, but it must be borne in mind that the particular characteristics of the selected schools may necessitate alterations in this plan.

DET

Eight hundred students will be selected from each of two schools. One school will be randomly selected from settled urban communities (Langa, Gugulethu and Nyanga), while the other will be selected from areas that have been more recently established (New and Old Crosssroads and Khayalitscha).

HoA

The total sample selected will be 3 000. All the students in 5 schools will be asked to respond to the questionnaire; this would give the required number of subjects assuming that there are an average of 600 students provide completed questionnaires. Three schools will be chosen from those falling under the Cape School Board while 2 will be chosen from those falling under the Parow School Board. The schools falling under the Cape School Board will be divided into three socio-economic levels

according to the area in which the school is situated while schools falling under the Parow School Board will be divided into two socio-economic levels. This will be done according to the composite indices of levels of living that have already been developed for each suburb of Cape Town using the following indicators: income; occupancy rates; the extent of shared accomodation by different families; the proportion of people owning cars; workers' educational levels; the numbers of single mothers with more than 3 children; and unemployment levels (Riley *et al.*, 1984). One school will be randomly selected from each level.

HoD

One school will be randomly selected and all the students attending that school will be invited to participate.

HoR

The total sample selected required will be about 5 400. All the students in 6 schools will be included in the sample; this will give the required sample size if 900 completed questionnaires are received from each school. Two schools will be selected from schools in each of the following areas: (i) the Cape Flats; (ii) Mitchell's Plain and surrounding areas; and (iii) other areas (e.g. the Northern Suburbs, Cape Town centre, South Peninsula and Wynberg). Schools in the Cape Flats and schools not in Mitchell's Plain or the Cape Flats will be divided into 2 levels each in the same manner as for schools falling under the HoA. It is not possible to do this for schools in Mitchell's Plain as the composite index was developed partly from data obtained in the 1980 census and is thus not valid for Mitchell's Plain. Schools in

Mitchell's Plain will be divided into 2 socio-economic levels using the dependency ratio calculated from information collected in 1985 (City Planner's Department, Cape Town City Council, 1988). This ratio is a measure of the number of people in the so-called "active" ages (15 to 64 years) as compared to those in the "dependent" age groups (0 to 14 and 65 and above); it correlates very highly with the composite index (Romanovsky, personal communication, 1990). One school will be randomly selected from each level.

3.4 Pilot studies

The questionnaire will be administered to several small groups of students.to gather feedback regarding ambiguities and other technical faults in the questionnaire as well as to ascertain their emotional responses while answering the questions. Such groups of students from HoR and DET schools will be assembled by two of the research assistants in the UCT Department of Psychiatry, each of whom has adolescent children and lives in the relevant communities with respect to one of the education departments. These students will then fill in the questionnaires before having detailed discussions with one of the investigators; in the case of the the Xhosa speaking students, one of the research assistants who is Xhosa speaking but who is also perfectly fluent in English will be present to interpret if necessary. A small group of students who normally attend schools falling under the HoA but who are currently day patients at the Groote Schuur Hospital/UCT Psychiatric Day Hospital will be approached to respond to the questionnaire; again, they will have detailed discussions with one of the investigators after they have done so. In addition, the questionnaire will be administered to a class in a

private school to exclude problems in the classroom context and in handling the data; St Joseph's College will be approached in this regard.

3.5 Implementation

Permission will be sought from the relevant education departments. Thereafter, the principals of the selected schools will be approached in the hope of gaining their support for the project. For schools where a sample is to be drawn, the details of the number of students in each school, the numbers of students in each class and the criteria according to which the students are allocated to each class within each standard will be obtained from the principals; this information will be used to decide on the sampling procedures within each school. The details of who would administer the questionnaire have yet to be finalised and may vary from school to school and also between the different education departments; it is however most probable that the research assistants employed by the Department of Psychiatry will be most involved in this regard. A short introductory talk will be given to each class in which the rationale for the research will be presented in order to gain the cooperation of the students. It will however be emphasised that participation is entirely voluntary and that there will be no repercussions if any students prefer not to respond to the questionnaire. The respondents will be seated as far apart as possible. The responses will be anonymous; students will be asked to put the questionnaire in an envelope before leaving it in a box. Approximately two weeks later each school will be re-visited to obtain questionnaire responses from students who were absent when the questionnaire was administered to the rest of their class. Final absentee rates from each class will then be calculated. It is hoped to conduct the school based aspect of the project during the second school term during

working hours; it may be appropriate to use time during the guidance periods. It will not be necessary for teachers to devote any time to the research.

4 ANALYSIS

The data will be analysed in collaboration with the Institute for Biostatistics, Medical Research Council (MRC). The SAS collection of packages will be used on the mainframe computer situated in the Computer Centre at the MRC. Descriptive data will be provided, although an attempt to explore certain determinants of and covariation between crucial health related behaviours may be made.

5. BUDGET

It will not be necessary to employ additional staff as the investigators, other CERSA staff members ,the personnel from the Institute for Biostatistics and Computer Centre (MRC) and the research assistants employed by the Department of Psychiatry (UCT) will be incorporating the research project into their usual duties. Additional costs for printing and transport will be borne by CERSA.

6. ETHICAL ASPECTS

In order to attempt to gain their support for the study, the National Education Crisis Committee and the students' representative councils (if applicable) of each selected school will be approached by one of the investigators after the school principal has given permission to proceed in order to attempt to gain their support for the study. Every attempt will be made to accomodate any criticisms or suggestions that they may have. All schools involved in the study will be given a report in which the results of the study are presented as well as any educational material that is indicated and available. There are no other *short term* benefits of participation in the study. Approval by the Ethics Committee of the UCT Faculty of Medicine has been sought.

Anonymity will be preserved throughout.

7. REPORTING OF DATA

After the protocol meeting, letters will be sent to the appropriate cabinet ministers in the fields of health and education as well as to the Director General of the Department of Health and Population Development to inform them of the study. The results of the research will be made available both to the individual schools that were involved (as mentioned above) as well as to the relevant educational authorities. Articles will be submitted for publication in scientific journals and in local educational newsletters and/or journals. In addition, aspects of this work may be presented at a conference that CERSA intends to host in about October 1990 in which various aspects of health education will be explored.

8. APPENDICES

The teo appendices to the proposal were as follows:

- the questionnaire; and
- details of the schools included in the sampling frame.

[These appendices are not included in this thesis since updated versions of both appendices are included as appendices to the thesis itself]

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Appendix 4

MEMORANDUM

FROM: Alan Flisher, on behalf of the investigators of the project entitled "Health Related Behaviour of Cape Town High School Students"

TO: All MRC members who attended our protocol meeting on 31 March 1990

DATE: 10 April 1990

This memorandum is motivated by our desire to respond adequately to the points made in the above meeting. We do not feel that we were in a position to do so on the occasion for several reasons, amongst which was the fact that the tone and structure of the meeting were not conducive to debating the various issues. Suffice it to say that the atmosphere associated with a gladiatorial extravaganza is not likely to result in amicable cooperative opposition with colleagues. This memorandum has incorporated many of the ideas that emerged in several discussions with the reviewers and other staff members after the meeting. Page references are to the original protocol. If anybody would like to know of literature supporting particular points they are welcome to approach me. I have grouped the comments into four broad categories.

I. LITERATURE REVIEW/RATIONALE

It was stated that the study is not necessary as the information is already available from other sources, viz. (a) mortality data, (b) agencies and other organisations, and (c) previous studies. Each of these potential other sources will be explored seperately.

(a) Mortality data. The aims of the study included the gathering of "data regarding the prevalence ... of certain aspects of health related behaviour" (p 16); furthermore, it was stated in the Method section that the "emphasis is on specific observable risk taking behaviours" (p 17). Now, one extreme outcome from risk taking behaviour is death, and it is only this outcome that is reflected in mortality data. Furthermore, in many categories there would be a proportion of deaths that did not result from risk taking behaviour. It is the risk taking *behaviour* that is relevant as it is here that interventions could have an impact thus preventing unfavourable outcomes. It is quite obvious that mortality data does not address the aims of the study.

(b) Agencies and other organisations. As mentioned on page 15 of the protocol, we have been approaching various agencies and organisations (e.g. SANCA) to determine if they have the data in which we are interested. Furthermore, some of us have worked in a variety of clinical settings where the focus is the kind of behaviour with which the study is concerned. We are thus able to conclude that the data is not in fact available; on the contrary, at least two of these facilities (SANCA and the Cape Town Drug Counselling Centre) are in the very initial stages of planning community based surveys, and these undertakings were inspired by their feeling handicapped by the paucity of the kind of information that we shall be gathering. It is tangentially relevant in this regard that we

have approached individuals and organisations that have interets in the various areas to be investigated to obtain their suggestions regarding which behaviours are most critical in terms of prevention.

(c) Other studies. It was stated that other studies were "dismissed" on methodological grounds but that it was not specified what these grounds were. Where studies were criticised from the methodological point of view the broad grounds of the criticism were certainly provided. However, there were no detailed methodological critiques, and it could be argued that these are indeed indicated in a protocol of this nature.

There introduction was criticised for not including information regarding the determinants of behaviour. This is certainly a valid point in the light of the fact that the aims of the study include the gathering of "data regarding the prevalence and determinants of certain aspects of health related behaviour" (p 16). However, to put this deficiency in context (but not to excuse it) it is necessary to realise that the major aim of the study was always to gather *prevalence* data; the determinants dimension was tagged on almost as an afterthought, after the introduction to the proposal had been completed! Clearly, the quality of the proposal would have been enhanced by omitting this aspect entirely. As stated in the meeting, we have not thought through this aspect and would have welcomed some input in this regard. We do intend to restrict our exploration of determinants to items already present in the questionnaire; the major focus will in all probability be on demographic factors. Thus information about "how behaviour is learned" is not directly pertinent to this enterprise. It was claimed that if we were to examine all possible determinants we would find some associations. Of course, this is true (for reasons associated with, *inter alia,* type I error). But it is necessary to emphasise

(again) that it was never the intention to engage in 'shot gun' research of this nature; the crucial analytic issues will be defined before the data is gathered.

Related to this is the consideration that there are no questions which ask *why?* as opposed to *how much?* Again, this does not form part of the aims of the project; it is not even subsumed under the concept of determinants. In any case, we do not believe that one can acquire valid information about why people do things from nomothetic research methodologies; human motivation is too complex for this. Intensive, qualitative designs are necessary to tap this kind of data.

There were some concerns expressed regarding the purpose of the survey and the use to which the results would be put. It was felt that it would not be possible to design intervention programmes on the basis of the data obtained. We agree - it was never the intention to contribute in this manner. It is however hoped to define the extents of various components of health related behaviour in order to motivate for the introduction of meaningful health promoting interventions in schools and other contexts and to help with setting of priorities. Furthermore, suitable "target groups" may be able to be defined for particular behaviours. Finally, the results of the study would describe the "pre-intervention" or baseline state of affairs. It is relevant in this regard that there are several potentially far reaching iniatives springing from various sources currently underway in the field of school health education in South Africa; clearly, sound prevalence data is necessary to inform these iniatives.

2. SAMPLING

We did anticipate some of the comments made with regard to the sampling. The three issues receiving attention were: (a) the total sample size; (b) the 'effective n' with regard to the stratification system; and (c) stratification criteria. Again, each will be discussed seperately.

(a) Total sample size. The first point to be made here is that there are no theoretically satisfactory methods of determining sample size in descriptive studies of this nature. Final decisions are made on the basis of intuition, precedant, and practical considerations. In addition to these aspects, we attempted to describe the "worst case scenario" and then calculate a sample size by substituting in various formulas. Hence our final decision (after much thought) regarding the total sample size; it is necessary to point out that this sample size was cleared with the people that will be doing the coding and punching. It did emerge in the meeting that the figures sucked from the various thumbs that were present at the meeting were somewhat lower than those extracted from our thumbs. The bottom line is that we are considering reducing our sample size from that originally anticipated by taking samples from each selected school; the plan is to select randomly a certain number of classes from each standard in proportion to the number of students in each standard in the selected school. Of course this procedure has the effect of reducing the "effective n" by virtue of the stratification aspect, but our statistical advice is that this will not have a sizable impact on the results.

(b) The "effective n". This is an old chestnut. Clearly, we need to place ourselves at a point on a continuum. At the extreme of statistical perfection, the sampling unit would be the individual student within a stratum. However, it is manifestly impossible for us to increase the

number of schools sampled given the immense practical issues of negotiating entrance to individual schools (both from the point of view of the authorities and the students). An additional dimension to be considered is that the sample should be as representative as possible - hence the rationale for stratifying at all. Complicating the whole dilemma is the fact that there is no method of calculating the impact of various sampling strategies on the "effective n"; it is merely possible to say that one strategy would be preferable to another in this regard. A reasonable compromise would appear to be to take two schools from each terminal sub-stratum and to reduce the number of levels of stratification. Thus, for example, for the the House of Assembly schools we would abandon the geographically defined strata (i.e. Cape and Parow School Boards) and stratify according to social class only. We would thus be able to obtain an assessment of inter-school variabliity in addition to intra-school variability (but we would have no way of knowing how much this inter-school variability differs from all the other possible inter-school variabilities).

(c) Stratification criteria. It was agreed in the meeting that the reservations that were expressed by Malcolm no longer applied once certain misunderstandings had been cleared up. It is worth noting that the stratification was performed in order to obtain a representative sample and not in order to compare results between various strata. The only comparisons in this regard that may be indicated involve the various education departments.

3. THE INSTRUMENT AND PILOTING

Several comments were made about the instrument. We have devoted many hours of thought, discussion and reading to the construction of the questionnaire and it is thus not surprising that many of the points raised

had been considered by us at some stage or another. At the same time it is obvious that the questionnaire distributed for the protocol meeting is a draft and that further changes are inevitable. Equally important is the fact that the piloting strategy presented in the proposal merely represents the initial steps; it is unarguable that any alterations suggested by the piloting procedures would themselves have to be piloted until the final questionnaire is achieved. As regards the piloting in the school context, it is a daunting task to obtain permission from the various education departments to enter the schools to perform the actual study without complicating this excruciatingly delicate process by seeking permission for pilot studies. Hence our decision to approach private schools in this regard; we would thus obtain information regarding the handling of the data. The circumstances surrounding the administration of the questionnaire would vary between education departments, school, and even class, and we would thus have to play certain aspects of the administration of the questionnaire by ear. It would be necessary to have "pilot studies" in each school that is selected; this could take the form of the first administration session being very carefully planned in consultation with the principals and/or teachers and subsequent sessions being modified in the light of experience gained from this session. Notwithstanding this, pilot studies will be carried out in state schools if the necessary consent can be obtained.

The specific questions raised with respect to the questionnaire will now be discussed.

(a) Why not use Likert scales and not yes/no responses? As mentioned above in this memorandum, the instrument was geared to obtaining information regarding observable health related *behaviour*. "Attitudes, beliefs and other intre-psychic phenomena were not

investigated as it was felt that the reesults would be less likely to be skewed by intervening cultural and linguistic variables" (p 17). Clearly, Likert scales are not appropriate to obtain information regarding behaviour as they are geared towards assessing attitudes. Furthermore, there are certain methodological problems with Likert scales *in general* that render their employment problematical at best. Finally, it is likely that only a small fraction of the sample would be able to obtain sufficient insight into this technique to render its employment reliable and valid.

(b) Why is the questionnaire so long? The questionnaire takes about 20 minutes to complete. The time required to complete the questionnaire is reduced by their being many questions that would only be answered if a particular behaviour had been carried out; for example, if a female had not had sexual intercourse she would not be required to answer any questions in Part 3 of the questionnaire. There is much white space in the questionnaire - the pages would thus be turned over rather rapidly, and previous studies have demonstrated that the positive reinforcement that this provides results in better quality responses than questionnaires that have fewer pages but are more densely laid out. Notwithstanding this, the length of the questionnaire is an aspect that we shall pay particular attention to in the piloting procedures. Also, we are unhappy with certain of the questions and obliterating them will obviously result in the questionnaire being shortened.

(c) Surely the language is too advanced for some of the more junior students? We agree that the wording of some of the questions requires attention. Again, we shall be devoting much attention to this aspect in the pilot studies.

(d) Are all the questions appropriate for the younger children? We would be reluctant to make assumptions about which items would be inappropriate for the younger children. One should also bear in mind that there are sizable proportions of students in the more junior classes of certain schools who are considerably older than might be expected by people not familiar with local circumstances.

(e) Why are there no items to check on the validity/quality of responses? We were intending to avoid this type of item partly because of the technical challenges involved and partly because we were reluctant to increase the length of the questionnaire. However, on further reflection we may revise our decision.

(e) Why not include some items dealing with positive aspects of health related behaviour such as diet, sport and not smoking? We did in fact consider having items dealing with both diet and sport but decided against it for the following reasons: (i) the length of the questionnaire would have been increased; and (ii) when we got to thinking about how the questions could be worded we realised that it is very difficult to tap the kind of information we would be after in a manner that would be reliable and valid (especially given the wide range in our sample in terms of demographic features). There is an item on not smoking included in the questionnaire. We could think of no other positive aspects of health related behaviour that would provide meaningful information.

(f) How do we know that the respondents would answer honestly? This is another old chestnut. There is of course no way of knowing with certainty that the responses are honest. But we can be reassured by several other studies carried out overseas using innovative methodologies that indicate that the responses do tend to be valid. This has perhaps

been most thoroughly researched in the case of drug abuse where it has been found that surveys give slight underestimates of the prevalence of drug taking.

4. IMPLEMENTION

Various inter-related concerns were voiced which we shall attempt to summarise. It was felt that there may be a lack of trust on the part of the respondents - this would be related to who would be administering the questionnaire (about which further information was presumably required). There is the possibility that certain students would be cynical about the project as it would be perceived to be emanating from those in authority. These are certainly weighty issues and we had pondered them. At the meeting there was a lack of certainty as to whether it was intended to educate the teachers and/or students involved in the survey. Access to schools was thought to be another problematical area.

Some of these issues are addressed in the protocol. The questionnaire will be administered by the investigators working in conjunction with the research assistants working in the UCT Department of Psychiatry. It was decided not to involve either the teachers or the school principals in the administration of the questionnaire for the following reasons: (i) a standardised procedure is desirable and this would not be possible as different teachers and principals would be involved with the different classes and schools; (ii) the probability of gaining access to the schools is increased if the resources of the education departments are not being requested along with permission to proceed with the study; and (iii) the students are presumably less likely to regard the whole enetrprise with suspicion if it is not associated directly with the education departments. The only people in the classroom (besides the students) while the

students are completing the questionnaire will be staff members of the UCT Department of Psychiatry and/or CERSA.

Permission from the education departments to enter the schools is in the process of being negotiated. It is not appropriate in this memorandum to provide details except to state that we have already obtained permission to work in the schools falling under the DET and we are guardedly optimistic about the other three departments. We are in the process of making contact with the NECC. Furthermore, we shall be requesting meetings with the SRCs in the selected schools; we shall explain why the study is necessary and attempt to gain their support. It is hoped that any cynicism would be attenuated.

The purposes to which the information will be put have already received attention in this memorandum. We shall be providing feedback to the staff of each of the schools participating in the study; in addition, where we have made contact with SRCs we shall arrange a meeting with them to present and discuss the results of the questionnaire. It should be emphasised that the purpose of the project is not to provide this information to the schools; this aspect is merely to be able to give something back to those who have cooperated with the research.

We were asked what we would do if a crisis were to be precipitated by an item in the questionnaire. The first point to be made is that if a crisis were to be precipitated this would in all likelihood have occurred anyway at some point in the future. In any case, crises have the potential to result in personal growth for the individual concerned and the unexpected precipitation of a crisis is thus not necessarilly a negative thing. Either a psychiatrist with a special interest in child/adolescent psychiatry or a clinical psychologist with a special interest in crisis intervention will be

present at all times while the students are responding to the questionnaire. It will thus be possible to provide on the spot professional assistance if necessary; furthermore the resources of the UCT/Groote Schuur Hospital Department of Psychiatry will be available if indicated.

We were intending to return to the schools a fortnight after the questionnaire had been filled in order to gather responses from students who were absent from school on the day of the administration of the questionnaire. It was suggested that we drop this plan for two reasons: (i) it is not worth the extra effort in terms of the increase in response rate that would be obtained; and (ii) the results would be influenced by the students having discussed the questionnaire amonst themselves. We shall follow this suggestion.

It is hoped that this memorandum has helped to clarify our responses to the various points made in the protocol meeting. We would welcome comments on this memorandum or other opinions about the research.

Appendix 5

Appendix 5

ADDITIONAL INFORMATION ABOUT THE PROCESS OF OBTAINING PERMISSION TO CARRY OUT THE STUDY

1. Pilot study

It was decided to do our pilot study in a private school so as to avoid the problems that were anticipated in gaining access to a school in a state education department. The particular school was chosen for the following reasons:

- they had co-operated with similar studies in the past;
- the school has a reputation of being liberal as regards the risk behaviours included in the study;
- religious sensitivities were less likely to be offended as compared to certain other private schools in Cape Town;
- it is geographically convenient; and
- the principal is known to me.

At my first meeting with the principal, he indicated that he was very willing to co-operate with us. He did, however, insist that an additional sentence be added to the introductory comments to Part 3. This sentence was to inform the students that they were free not to answer any or all of the questions if they so wished. Furthermore, he requested that a letter to go out to the parents of the students concerned; this letter was (in his words) to "professionalise" the study, and to give the parents the option of withdrawing their child from the pilot study.

The following day the circulars for the parents were delivered to the school. The questionnaire was completed by one of the standard 9 classes a few days later. All these students completed the questionnaire within 25 minutes. Thereafter, there were about 45 minutes available for discussion. The class was certainly not shy to express their opinions, and the following points were made.

- Many students had difficulty answering questions that asked whether they had hurt other people or been hurt by other people. They were particularly confused as to whether this included play fighting. As a result of these comments, the wording in these questions was altered from "hurt" to "injured".

- There was concern as to whether school staff would have access to the responses. This indicated the need to emphasise the confidentiality aspect in introducing the study at the schools.

- The opinion was expressed that the investigators were discriminating against women by not including questions on Lesbian relationships. However, when the rationale for omitting these relationships was explained (*viz.* that Lesbian

relationships do not place one at risk for adverse health consequences), this was accepted by the students.

- One student had been taking analgesics for Still's Disease, and he was disturbed that there was no way on the questionnaire that he could communicate this. Thus, a question about the reason that the respondent was using analgesics was added to the questionnaire.

I had a discussion with the class teacher after the students had completed the questionnaire. He said that he thought that the administration of the questionnaire had served a useful purpose in that it had opened various topics that he would continue to discuss with the students.

2. Department of Education and Training

Separate meetings were held with the Chief Executive Directors of the East and West Regions of this Department. Both were enthusiastic about the project and gave unconditional permission to proceed.

School DET1

It was necessary for me to have only one meeting at the school (attended by the principal and guidance teacher) before the questionnaire was administered. The guidance teacher, who understood the concept of random selection, selected the classes to participate in the study.

Four research assistants and I administered the questionnaire. Dr Carl Ziervogel, another investigator involved with the project, was present for part of the first period. There were several problems experienced during the administration of the questionnaire, including the following.

- The standard of discipline in the school was poor. It was in some cases a major challenge to maintain a satisfactory degree of cooperation and concentration in the classroom. In many cases, the administration of the questionnaire commenced relatively late in the period since the students did not arrive punctually in class at the commencement of the period.

- For logistic reasons, there were four classes that had to complete the questionnaire simultaneously. Even though the woodwork room was used for this session, it was still somewhat crowded and there was not sufficient space between the students. There was the potential for the students to see how their classmates had responded.

- The principal allocated the last two periods of the day (when the concentration of the students may be waning) for the administration of the questionnaire. In addition, there was to be a political meeting immediately after the final school period; this was a source of distraction since the final period was interrupted by students entering the classes to advertise the meeting.

School DET2

As for the above school, only one meeting was held at the school prior to the administration of the questionnaire. The principal, guidance teacher and I attended this meeting. Material conditions in this school are particularly poor; for example, there is a shortage of furniture and there is no school secretary.

Despite my misgivings, the principal requested that all the students be addressed in one large group before having them go to their separate classes to complete the questionnaires. I sent a letter to the principal in which I informed her which classes had been randomly selected to participate in the study.

When four research assistants and I arrived at the school to administer the questionnaire, arrangements were far from complete. After much shouting and announcements over the intercom, and many misunderstandings, the students from the selected classes were ushered into the staff room (which was the largest room in the school). They were to have been addressed by a Xhosa-speaking research assistant, but this plan was abandoned since she could not speak sufficiently loudly to be audible above the noise that the students were making. The guidance teacher thus gave the necessary instructions before the students dispersed to the classrooms in which they were to complete the questionnaire.

Unfortunately, the teachers had not been fully informed about what was to happen. There were some difficulties in ensuring that the correct number of questionnaires and envelopes were available in the appropriate classrooms. Furthermore, there were some classes for which it was

impossible for a member of the research team to supervise the administration of the questionnaire; in these cases, the teachers supervised some of the classes. In some classes there was a fair amount of noise and again it is likely that there was some loss of confidentiality.

After the administration of the questionnaire had been completed, the research team had a brief meeting with the principal who was extremely apologetic that the level of organisation had been suboptimal. However, she explained that the reason for this was the inadaquate physical circumstances at the school and the fact that there had been several other visitors on that day.

School DET3

The first two appointments that I arranged with the principal were canceled after I had arrived at the school; on the first occasion, a staff meeting had been arranged for the same time as the appointment, and on the second occasion, there was an anticipated inspection. At the first meeting at which we discussed the project, the principal indicated that it was an awkward time to administer a questionnaire as two teachers had recently left the school and she was busy reorganising the timetable. She did however agree that we could proceed, and she said that she would discuss the project with the Students' Representative Council in an attempt to secure their cooperation. She was reluctant for members of the research team to meet with the SRC since she was of the opinion that it was more likely that they would support the project if she discussed it with them. Finally, she asked me to contact the Chief Executive Director responsible for her school region to ask him to contact her to confirm that the project did indeed have the approval of the Department. She was

particularly concerned that she should be covered if problems should arise.

The Chief Executive Director was out of town which caused a delay of about a week before he could be contacted. He said that he would contact the principal immediately. However, when I telephoned the principal one week later to finalise the arrangements, she informed me that the Chief Executive Director had not contacted her. I contacted him again and he assured me he would telephine the principal immediately, which he did do.

The team that administered the questionnaire consisted of Professor B. A. Robertson (one of the investigators), three research assistants, and I. On arriving at the school, it transpired that the principal had spoken to the school's SRC only the previous day. Although they were supportive of the project in general, they denied permission for the standard six class to participate.

The school secretary did most of the organising for our visit. We were to administer the questionnaire to classes individually throughout the day during the guidance and physical education classes. However, it soon emerged that we would not get through all the required classes in this manner. For the last two or three periods of the day, we gave the instructions for the questionnaire to groups of two or three classes simultaneously before they completed the questionnaire in private on the fields surrounding the school. In general, there was a satisfactory amount of order when we administered the questionnaires in the classrooms and when giving the instructions for the completetion of the questionnaire to groups of classes. However, it was impossible to prevent a certain amount of contact between the students once they were in the field. My

impression was that this was minimal since most of the students were seated some distance from each other.

There was one class that could not be located! Two of the research assistants returned to the school on another occasion to administer the questionnaire to these students. There were apparently no problems on this occasion.

School DET4

It was only on my fourth visit to this school that the research project could be discussed. When I arrived for my first appointment, she was too busy to see me. She said that I could return at any time on another day. However, I arrived 15 minutes before the end of the school day, and she said that this would not be sufficient time to discuss the matter. On the third occasion on which a meeting was arranged, the principal said that the guidance teacher should be involved. However, this teacher did not have time to speak to me. It was thus only on the fourth visit to the school that the arrangements could be made.

Four research assistants and I administered the questionnaire at this school. The plan was to administer the questionnaire to individual classes throughout the day. The first few classes were done in the woodwork room, which was a very suitable venue since there was sufficient room for the questionnaires to be completed in private. However, it became apparent towards the end of the day that there would not be sufficient time for all the studetns in the selected classes to complete the questionnaire. It was thus decided to divide the remaining students into two groups of approximately 100 students each. In

successive periods, each group was addressed in the school's quadrangle before they went to the school fields to complete the questionnaire. As for the previous school, this did enable most of the students to complete the questionnaire in private; however, approximately twenty students did converse with each other while completing the questionnaire

3. House of Representatives

A meeting was held with the Chief Executive Director, the Head of the Psychological Services, and the Chief Inspector of this Department. All three officials were supportive of the project. They had experienced no significant objections from students, school staff, or parents to the Family Guidance Programmes offered by their Department (which are concerned with, *inter alia*, the prevention of drug abuse, teenage pregnancy, and sexually transmitted diseases), which they felt augured well for the project involving risk behaviour of high-school students. They requested a list of the selected schools in order that the principals of these schools could be asked to come to a meeting in which the project could be discussed. In addition, they requested sufficient copies of the protocol for distribution to all the principals involved. It was explained that, although the principals would be encouraged to participate in the research, it was the principals of the selected schools that would make the final decision after having consulted with the relevant constituencies in each school community.

The meeting with the principals of the selected schools was attended by the Head of the Psychological Services and the Chief Inspector of the Department. In general, there was acceptance of the project. However, there was a great deal of concern about the manner in which the results

would be analysed. Although they were reassured that there were no questions regarding the race or ethnicity of the participants, they were very interested in whether it was intended to report the results separately for each education department (which would to a large extent have corresponded to population group). They were very concerned that there would be the possibility of accusations of racism being made against the research, and by implication against the participating principals or schools. The rationale for presenting the results separately for each department was presented in detail, but this explanation was not acceptable to the principals. Eventually, it was agreed that we would not present the results separately for the different departments and that we would confirm this in writing in a letter to each of the principals. If this assurance had not been given, permission to conduct the study would certainly have been denied.

There were other concerns on the part of the principals. Some were concerned about whether there would be any practical consequences of the project. Others were concerned about the language used for some of the items, but were reassured that (for the questions involving sexual behavior) it would not differ from that used in biology and guidance classes. The fact that the research was perceived to emanate from the University of Cape Town and not the Department of Education and Culture of the House of Representatives or a statutory research organisation was regarded in a positive light.

At the conclusion of the meeting, it was agreed that permission would be granted subject to the condition (*inter alia*) that the results would not be reported according to education department.

School HoR1

I attended a meeting with the principal, the deputy principal, and the two teachers who were most involved with the guidance classes. Most of the discussion involved the most suitable time to administer the questionnaire. Eventually, they decided to arrange it for one of the days on which the students were to write examinations.

The principal had already sent a circular to the parents at the school before the meeting with the school principals. Of the 892 students at the school, the parents of 630 students had given permission for their children to complete the questionnaire.

Unfortunately, the day that was selected to administer the questionnaire coincided with the only day on which School HoR2 was able to accomodate the project. Neither school could alter the selected date. For this reason, I was not able to be present for most of the time that the questionnaire was being administered, although I did arrive towards the end of the process. The other investigators involved with the project were also unable to be present on that day. Four research assistants administered the questionnaire.

The questionnaire was administered in 3 sessions:

1. the Std 10's completed the questionnaire in separate classrooms for each class;

2. the Std 8's and 9's completed the questionnaire simultaneously in the school hall; and

3. once they were finished, the Std 6's and 7's completed the questionnaire simultaneously in the hall.

The school hall is modern and spacious and has a public address system. There were no problems in administering thequestionnaire. The level of discipline was high and the questionnaires were completed in privacy.

School HoR2

At the meeting with the school principals, the principal of this school emphaised that it would not be possible for the questionnaire to be distributed during the second school term. However, the day after this meeting, he telephoned me to ask if I could deliver letters for the parents to the school in which the project was explained (this letter is provided at the end of this Appendix). He said that if the letters could be delivered very soon it might be possible for the questionnaire to be completed during the second school term. So far as parental consent was concerned, he indicated that he would be satisfied with passive consent, in other words that the parents should contact him if they had any objection to their children completeing the questionnaire. If they did not do so, he assumed that there was no objection. There were 12 students whose parents indicated that they were not willing for their children to participate in the study.

There were various practical problems associated with administering the quesionnaire at this school: *(i)* as mentioned above, the only day on which this was possible coincided with the day that had been arranged for School HoR1 - the principal made it clear that if that day was not possible for us we would have to postpone administering the questionnaire until the

following term; *(ii)* a team of about ten people was required since the entire school would have to complete the questionnaire in a short period of time; and *(iii)* the selected date was only four days away (one of which was a public holiday), which did not leave a great deal of time in which to recruit and train the necessary personnel. Despite this, a team consisting of the following people was assembled:

- four registered nurses employed as community psychiatric nurses at Groote Schuur Hospital;

- two people employed as research assistants in the Department of Psychiatry at the University of Cape Town, one of whom had an honours degree and the other a masters degree;

- four relatives of friends or colleagues, all of whom had completed standard 10.

I had meetings with each of these individuals in the days prior to the visit to the school. I explained the nature of the project and what they would be expected to do at the school. In addition, I gave them the questionnaires and envelopes for the first class to which they would be administering the questionnaire.

The principal wanted the questionnaire to be administered in each class separately. It was agreed that we would all meet at the school at 08h15. However, one person arrived 30 minutes late and two did not arrive at all (they subsequently said that they could not find the school, which was difficult to accept in the light of the fact that they had all been given detailed instructions). This caused great inconvenience as they had copies of the questionnaire and there were thus not sufficent copies of the

questionnaire to be given to the classes that they were to have supervised. For this reason, it was not possible to complete the administration of the questionnaire at the school on that day. Two research assistants and I returned to the school on the following day to administer the questionnaire to the remaining students. On both days at the school, there was no difficulty with discipline and the students were able to complete the questionnaire in private.

School HoR3

This school was one of the pilot schools for the programme on family life given by the education department. Possibly partly for this reason the principal of this school was enthusiastic and cooperative from the beginning. At the meeting with the principals, he said that he had already discussed the project with the parents and with the SRC and that there were no objections.

The principal wanted us to administer the questionnaire on a class by class basis. We went to the school on 4 occasions, doing about 5 classes on each occasion. I attended the first 2 sessions only; after that, the research assistants administered the questionnaire. The classes were orderly and the students were able to complete the questionnaire in private.

School HoR3

At the original meeting with the department, the principal of this school suggested that the wording in some of the questions be changed and that

a debriefing session be held with the pupils afterwards. Furthermore, he expressed doubt as to whether we would be able to complete the questionnaire during the second term.

I spoke to him telephonically a few days after the meeting. He said that he would discuss the matter with the staff and SRC, and come back to me as to whether the project could be implemented in the second term. When he telephoned a few days later, he said that it may be possible to do the study in the second term after all. He requested copies of a letter to be distributed to the parents explaining the purpose of the study (this letter is provided at the end of this Appendix). As for the principal of School HoR2, he was of the opinion that passive consent would be sufficient in that parents should contact the school should there by any objections. No parents contacted the school to indicate that they had any objections to the questionnaire being completed by their children.

When finalising the arrangements, the principal indicated that the whole school would be present on the day that the questionnaire was to be administered. However, only about two-thirds of the students were present. Five research assistants and I administered the questionnaire to each class individually. The folllowing term, four research assistants visited the school again to obtain questionnaire responses from those who were not present on the day that the questionnaire was originally administered.

The level of discipline was satisfactory and the questionnaires were able to completed in private on both days that the questionnaire was administered.

School HoR5

The principal of this school delegated the deputy principal to attend the meeting of the principals at the Head Offices of the Department. I spoke to the deputy principal shortly after the meeting, and he said that he would arrange meetings with the school staff, the parents, and the SRC to discuss whether the project should be allowed to proceed at the school. He said that he would let me know the outcome within about 10 days. He contacted me within a week to say that we would be able to go ahead. He did however request that a letter to be sent to each parent in which the project was explained. In addition, each parent was required to complete a reply slip in which permission was granted or denied for their child to participate in the project.

I had a meeting with the principal prior to the letters for the parents being delivered. During this meeting, it emerged that he would be satisfied with passive consent; we could assume that the parent had no objection to their child completing the questionnaire unless they informed the school to the contrary either by using the reply slip or telephonically. However, some days later the principal changed his opinion and indicated that it would after all be necessary for each parent to give written permission for their child to complete the questionnaire. There were 97 students (of a total of 971 students) whose parents refused permission to complete the questionnaire.

A date was set to administer the questionnaire late in the second term. The Deputy principal had been assured that almost all the students would be present. However, two days before the questionnaire was due to have been administered the Deputy principal contacted me to say that he

anticipated that there would be very few students attending school on the selected day. A new date was set for early in the third term.

Ten research assistants and I administered the questionnaire to each class individually. However, one research assiatant did not arrive, which was a considerable handicap since we needed to "do" two classes simultaneously on occasions. The school had made excellent arrangements for our visit. We were all given maps indicating where each classroom was situated and how many students would be in each class. The only problem was that we could not locate the keys to several locked classroom doors, and this retarded things somewhat. There were no disciplinary problems in any of the classrooms. The folowing week, the Deputy principal telephoned to say that one of the classes had inadvertantly been omitted. We arranged for two research assistants to return to the school to rectify this situation.

School HoR6

I telephoned the principal of this school a few days after the initial meeting with the principals. He said that he wanted to discuss the matter with the school staff and the SRC before making the final arrangements to proceed. He telephoned some days later to say that there had not been any objections either from the school staff or the SRC.

The questionnaire was administered in the school hall. The principal had assured me that there would not be any problems in terms of privacy at this venue. It was necessary to complete the questionnaire in two sessions only, and the hall was extremely full for each of them. It is

probable that some students could see what others were writing. This aspect notwithstanding, the level of discipline maintained was satisfactory.

4. House of Assembly

The initial meeting with managers of this department was attended by the project investigators and a Chief Inspector of Education, the Chief of the Educational Psychology Services, and an official of the research section of these services. The project was discussed in some detail, and another appointment was made for a fortnight later. At this meeting, we were informed that permission would not be granted to include Part 3 of the questionnaire (which was concerned with sexual behaviour). Suggestions were made as to how this part could be altered to make it acceptable to the Department, but these suggestions were rejected since they were aimed at obtaining data about opinions or attitudes as opposed to behaviour.

Despite the results of this meeting, it was decided formally to apply to do the study as originally planned, with no alterations. As anticipated, permission was refused. However, Professor B. A. Robertson (one of the investigators of the study) telephoned the Chief Director of the Department. He agreed that the study could proceed as originally intended, but that a parent or guardian of each selected student would need to provide *written* permission for their child to participate. In addition, the parents or guardians would need to be given the opportunity of discussing the questionnaire with the investigators. However, the parents would not need to give permission for their children to complete an abbreviated version of the questionnaire in which all the questions

dealing with sexuality (including the questions dealing with sexual harassment in Part 1 of the questionnaire) were excluded.

School HoA1

At the first meeting that I had with the principal of this school, he indicated that he would need to discuss the project at the next meeting of the school committee which was to be held a week from then. He requested copies of the questionnaire for each member of the committee. He expressed some concern as to the practical aspects of implementing the study, but we agreed that these would probably be able to overcome relatively easily. He also said that he would discuss the matter with the chair of the school committee telephonically prior to the committee meeting.

A couple of days later, the principal telephoned. He said that he had read out some of the items to the chairman of the school committee, and that he was quite adamant that the questionnaire would not be able to go ahead so long as any questions from Part 3 were included. The principal intimated that he was in fact in agreement with these sentiments. He said that there would probably be no problem with Parts 1, 2 and 4 of the questionnaire. After some discussion, he agreed that members of the research team should nonetheless attend the meeting of the school committee.

Dr Carl Ziervogel (one of the investigators) and I attended the meeting. The chairman began by stating that this school considered itself to be progressive and enlightened. Nonetheless, they were now possibly on the point of refusing to co-operate in the first study of its kind in South

Africa dealing with sexual behaviour. He thus invited us to try and convince them that they were wrong. It soon emerged that there were some members of the school committee that did want the questionnaire to be administered in its entirety.

The principal and other members of the committee expressed reservations, including the following:

- students might be encouraged to carry out some of the behaviours asked about in the questionnaire;

- the considerable practical difficulties in terms of getting adequate parental response rate to a circular as requested by the department;

- the impact that questions dealing with sexuality might have on the more innocent younger students; and

- the problems of arranging a parental meeting (as required by the conditions that had been laid down in the permission granted by the Department of Education and Culture of the House of Assembly).

Certain members of the committee considered it highly relevant that the questionnaire was to be administered in its entirety a few days later at another school in the HoA. Some committee members queried the scientific validity of the survey, but we were able to convince them that there were no scientific aspects that would justify the school's not participating in the study. At the conclusion of the meeting, the chairman

said that they would inform the researchers of the decision of the committee as soon as possible.

A couple of days later the principal telephoned the principal Investigator. He said that the committee had agreed that Parts 1, 2 and 4 of the questionnaire could be administered, but that Part 3 must be excluded. He added that certain committee members were in favour of the questionnaire going ahead in its entirety.

He said that it would not be possible to administer the questionnaire in the second term; this was because his school was experimenting with letting the children go home after writing their examinations and not returning for the last week of school. He was not prepared for them to fill in the questionnaire before an examination as he felt that this might affect their concentration. He said that he would discuss it with some of the teachers on his staff, and then report back. He telephoned a couple of days later to say that we would indeed not be able to complete the study during that term.

At the time, it was anticipated that it would have caused some disruption to the research programme if the questionnaire had not been administered during the second term. It was thus decided to select another school to replace this school. It subsequently emerged that there were several other schools (mainly in the House of Representatives) at which the questionnaire was administered to some of the students in the third term; it would thus not have retarded the project if the questionnaire had been completed during the third term at School HoA1. Another school was selected to replace this school.

School HoA2

Dr Carl Ziervogel and I had a meeting with the principal of this school, in which he was generally supportive of the research. However, he was concerned that the students attending the school might get a reputation for engaging in the behaviours enquired about in the questionnaire, resulting in pupils going to other nearby schools in the neighbourhood. He said he would consult with the school committee and report back. Two days later he telephoned to tell me that we would not be able to proceed at their school. This was a blanket refusal; even Parts 1 and 2 were unacceptable. When he was asked about the reasons for this, he said that certain member sof the school committee were concerned about the "vermindering van ons blanke skoolkinders". However, he did not want me to have the impression that they were not a co-operative school; he pleaded for us to approached his school if we were planning to conduct any future studies with less controversial subject matter. Another school was thus selected to replace this school.

School HoA3

The principal of this school refused point blank to co-operate. He was not even prepared to let me describe the nature of the project to him. His reason was that the school had had several renovations recently, and that he was not prepared to tolerate any further disruptions in the daily programme. Another school was selected to replace this school.

School HoA4

At the initial meeting that I had with the principal of this school, he could not have been more encouraging or supportive. He said he would discuss the matter with certain members of the school committee who would arrange for circulars to be sent to the parents immediately. A provisional date was set for the administration of the questionnaire.

He contacted me telephonically a few days later, saying he had posted copies of the questionnaire to all the members of the school committee. The majority were not in favour of proceeding so far as Part 3 of the questionnaire was concerned. He made the comment that all the women were in favour of proceeding with Part 3 whereas all the men were not. I pointed out that part of this reaction of the committee may be due to their not having received any motivation for the questions to be included. It appeared that the committee were concerned about the possible effects that distributing the questionnaire could have. In particular, they were concerned that the school would obtain the reputation of having many students engaging in inappropriate sexual activities.

There was to be a school committee meeting a fortnight later. After much discussion, the principal agreed to try to persuade the committee to compromise in some way, for example by giving an abbreviated version of the questionnaire in which those questions dealing with sexuality were excluded to students in Standard 6. Another possible compromise was to include some of the questions dealing with sexual behaviour, but to exclude others that are more likely to give offence. I emphasised that we would be keen to proceed with Parts 1, 2 and 4 even if Part 3 was totally excluded. The principal said he would contact me soon after the school committee meeting. The day after the committee meeting, the school

secretary telephoned to say that the study would not be able to proceed at this school. It was however, not clear whether this referred to the entire questionnaire or just to those aspects dealing with sexuality. She said that the principal had not telephoned personally since he was busy the whole day and would wanted the me to know the decision as soon as possible. When he did make contact, he explained that no parts of the questionnaire could be administered at the school. The concern was that the school would get a reputation for requiring investigation into the behaviours included in the questionnaire. He expressed apologies for not being able to carry out the research at his school.

School HoA5

At our initial meeting, the principal expressed great enthusiasm about the research. He said he would send circulars to the parents with a tear-off slip for the parents to provide or deny permission for their children to participate in the study. He said he would "scotch" the requirement regarding a meeting with parents. He did, however, say that he would confirm this with the circuit inspector. There was agreement about a date to administer the questionnaire.

About one week later, the principal telephoned me. He said that he had just been speaking to the inspector who had insisted on sticking strictly to the preconditions specified in the letter of permission. He said that he would write me a letter containing lists of those children whose parents had given and denied permission for their children to participate in the study. Only 44 students out of a total of 240 students had permission to complete the entire questionnaire. The original date that we had set for the administration of the questionnaire was postponed.

After I received the above letter, the principal arranged for me to address the parents for ten minutes at the quarterly Parents' Teachers' Association meeting. There were only about 100 parents present at this meeting (possibly because of inclement weather). There were very few questions and these were not at all critical. Some consent forms were left for those parents who may have changed their mind about their children participating after having heard the address and the ensuing discussion; however, no parents took advantage of this opportunity. After the meeting, 2 teachers approached me and said how glad they were that this project was being done.

The administration of the questionnaire took place in the school hall. There were two sessions; the first session was for those doing the long questionnaire while the second session was for those doing the abbreviated version for which there were no pre-conditions. The students were all cooperative and were able to complete the questionnaire in private.

School HoA6

Dr Ziervogel was responsible for the arrangements at this school. After he had discussed the project telephonically with the school principal, a meeting was held with the principal, the school counsellor/guidance teacher, and Dr Ziervogel. At this meeting the nature and purpose of the research study was explained in greater detail. Both the principal and the guidance teacehr felt that the validity of the study would be increased if as many pupils as possible could complete the entire questionnaire (including those parts dealing with sexuality).

A letter was sent to the parents explaining the nature of the study and requesting their permission to allow their children to participate in the study. This letter is provided at the end of this Appendix. Permission to complete the entirte questionnaire was given by the parents of 155 students (out of a total of 250). At the following PTA meeting, Dr Ziervogel was present to answer any queries about the research; however, there were no queries whatsoever!

The questionnaire was administered in the school hall by Dr Ziervogel and four research assistants. The students were spread out and unable to see each other's questionnaires. All the students in the school completed the questionnaire simultaneously. A teacher was present in the initial phases only to assist in settling the children down; thereafter, only members of the research team were present while the questionnaire was being completed.

School HoA7

The School principal was suffering from a terminal illness. For this reason, all the contact was with the acting principal (hereafter referred to as the principal). At the first meeting, he informed Dr Carl Ziervogel and me that the matter would need to be discussed at a meeting of the School committee. He also commented that the fact that the management of the Department required written consent from the parent of each child who completed Part III of the questionnaire indicated that the Department did not support the project completely.

The principal telephoned about a week after the first meeting to say that the school cmmittee had refused permission for the project to be

undertaken at their school. Furthermore, he had made enquiries at the department; he was told that if one parent was against his son or daughter filling in the questionnaire, then permission to proceed in that school would be refused. He said that he would be prepared to consider allowing us to distribute the rest of the questionnaire if he had a specific instruction from the department. Permission had at that stage been granted to administer the entire questionnaire, on condition that a parent of each participating child had given consent in the manner described above. In addition, if an abbreviated version of the questionnaire was to be given, the school concerned was to make written application to have the requirements in terms of consent to be altered. The principal said that he was not prepared to do this. Furthermore, he was not prepared to discuss the matter until he had an instruction from the Department. I then telephoned the official at the Head Office of the Department to explain our dilemma. It was made quite clear that it would not be possible to provide another letter giving permsission to proceed with the study with diminished requirements in terms of consent if Part 3 was not to be distributed. After numerous telephone calls and faxes, the Department finally did provide a letter in which permission was granted to distribute an abbreviated version of the questionnaire with no parental consent.

I then had another meeting with the principal, at which he was very cooperative. He was however not prepared to allow the members of the research team to administer the questionnaire. There were howver several members of the research team present at the school while the questionnaire was being completed. The administration of the questionnaire proceded without any difficulties.

School HoA8

When I first met with the principal, he was supportive of the research. He said that the information to be gained would be useful to the school, but that it was impossible for the school itself to get this kind of information. We discussed some of his concerns about the practical aspects of administering the questionnaire. He said he would read our protocol and come back to me within two days.

Two days later he telephoned me to say that the questionnaire was unacceptable to the school. He based this conclusion on his own impressions as well as conversations with a few crucial individuals. After some discussion, it emerged that it was Part 3 that constituted the stumbling block. I asked if he would consider us administering Parts 1 and 2 of the questionnaire, possibly even with some of the more sensitive questions in Part 1 omitted. He said he would have to consider this and would telephone me again within a couple of days.

He did not phone me within a couple of days. I thus decided to wait until we had permission to distribute the abbreviated version of the questionnaire without pre-conditions (see above). I then had a meeting with him in which I showed him the abbreviated version of the questionnaire. He said that we could indeed go ahead with this version. As with School HoA7, he was not prepared to have members of the research team administering the questionniare. He assured me that they would be sensitive to the issue of the teachers seeing what the students were writing.

It was decided to include every second pupil according to seating position as the school has more than 1 000 students. On the day that the

questionnaire was completed, the standard 10 class was not available, and they completed the questionnaire at the beginning of the following term. I was present at the school when the students were completing the questionnaire, and no problems were brought to my attention.

School HoA9

Dr Ziervogel and I had a meeting with the principal in which he was extremely cooperative; he said that he would really like to have access to the information that the questionnaire would provide. He said that he would draw up a circular, with a reply slip in which the parents could provide or withold permission to proceed. So far as a meeting with parents was concerned, he was of the opinion that a meeting with the school committee would be sufficient.

He contacted me a few days later. He said that he had gone through the letter of permission from the department, and that he was of the opinion that a meeting of the parents themselves was necessary after all. He undertook to arrange this meeting, and said that he would encourage the parents to give permission for their children to participate. He telephoned me a couple of days before the meeting to say that about 60 parents were expected to attend.

At the meeting, I provided a summary of the rationale for the study, as well as some comments about the research methodology. Dr Ziervogel went through the questionnaire in some detail. There were many questions, none of which were hostile or disapproving. Copies of the Afrikaans version of the questionnaire were distributed. At the conclusion of the meeting, there was unanimity that the questionnaire should be

allowed to proceed in its entirety and that we should receive all the co-operation possible from the school. All the parents at the meeting signed a piece of paper giving permission for us to administer the questionnaire to their children. Furthermore, it was agreed that the principal would send a circular to the parents with a reply slip for the parents to indicate whether the parents gave permission for their children to participate or not.

On the day that the questionnaire was distributed, the principal had arranged for all those whose parents had given permission for completion of the full version of the questionnaire to be situated in one classroom. Thirty-four students (out of a total of 192) were given permission to complete the full version of the questionnaire. The questionnaire was administered in all the classes simultaneously. The level of discipline was extremely high and my impression was that there was very little opportunity for students to see what their classmates had written.

School HoA10

As for School HoA6, I was not involved with the administration of the questionnaire at this school; Dr Ziervogel took on this responsibility. At the first meeting at the school, attended by Dr Ziervogel, the School principal, and the School Counsellor, it was agreed that a letter would be compiled in which the project was explained and the parents asked to give permission for their children to participate. In addition, a date was set for a meeting at which parents could discuss the project with Dr Ziervogel.

Of the total school population of 770 students, 562 were given written permsission to participate in the study. However, only seven parents

attended the meeting arranged to discuss the research. All of these parents were willing for their children to complete the full version of the questionnaire.

The questionnaire was administered in a single period on the last day of the second school term. Approximately half of the students completed the questionnaire in the school hall, while the rest did so in the gymnasium. Dr Ziervogel and four research assistants administered the questionnaire; no teachers were present. There was a satisfactory level of co-operation, and no evidence of responses not being confidential.

5. House of Delegates

Dr Ziervogel was responsible for all the arrangements made with the school selected from this Department. At the initial meeting, the principal undertook to discuss with his teachers and with the SRC. During a subsequent telephone conversation, a date was set for the administration of the questionnaire; this date was after the examinations at the end of the second term; the principal was not prepared to consider administering the questionnaire before the examinations or during the examinations (despite Dr Ziervogel's misgivings about doing it after the examinations).

When Dr Ziervogel telephoned the principal to confirm the arrangements, the latter expressed some concern as to the number of pupils who would be present because it was the last week of term and examinations had been completed.

On the morning that the questionnaire was due to be admninistered, Dr Ziervogel telephoned the principal to inform him that they would be

arriving at the school within 30 minutes. The principal said that there were only 20 pupils present at school that day! He said that he would approach these students to ascertain whether they were willing to complete the questionnaire (even though the SRC had already consented in this regard) and that he would telephone Dr Ziervogel shortly with their decision. He did not telephone within the following hour and Dr Ziervogel had to leave Valkenberg Hospital (where he was awaiting the telephone call) to attend to another matter. The principal did telephone back later on in the morning, but by then it was too late to administer the questionnaire.

At the beginning of the third term, Dr Ziervogel telephoned the school to arrange another time for the interview. However, the school could accomodate the research only approximately two weeks after the commencement of the term. This would have retarded the progress of the entire research project since all the other schools would have completed the questionnaire in the first couple of days of the third term. In the light of the fact that an abbreviated version of the questionnaire was to be administered, and that the number of students attending schools in the House of Delegates was small in reltion to the other departments, it was decided not to include the House of Delegates in the project.

6. Letters sent to parents/guardians

The following are the texts of letters sent by the researchers to the parents/guardians of the students at the selected schools. Letters about the project sent to the parents/guardians by the schools themselves are not included. All the letters were on letterheads of the Cenre for Epidemiological Research in Southern Africa of the Medical Research Council, the Department of Psychiatry of the University of Cape Town, or

the Red Cross War Memorial Children's Hospital. All the letters had the heading: "To all parents/guardians at *** school". For some of the schools, there was also an Afrikaans version of the letter, but this is not included below. The reply slips are also not included; they consisted of:

- spaces for the parent to enter the name of their child and the date;

- two blocks, one of which was labelled *I hereby give permission for my son/daughter to participate in the research* and the other one *I would prefer my son/daughter not to participate in the above project* - the parent was required to tick one of these two blocks; and

- a place for the signature.

School HoR2

This circular is in connection with a research project being undertaken by the Centre for Epidemiological Research in Southern Africa in collaboration with the Department of Psychiatry at the University of Cape Town. The research involves health related behaviour of Cape Peninsula high school pupils. *** high school is one of the schools that have been randomly selected from all the education departments in the Cape Peninsula. We intend to distribute a questionnaire to be filled in by the pupils at school; a wide variety of behavior is covered, including behaviour leading to traffic accidents and interpersonal violence, suicidal behaviour, abuse of cigarettes, alcohol and various other substances, and sexual behaviour. The language and terminology used is similar to what pupils would have been exposed to in their guidance and biology classes. If there are questions which a pupil would prefer not to answer, he or she is perfectly free simply to leave those questions out. The results of the survey will be anonymous. We shall be reporting our results for the survey as a whole; in other

words we shall not be giving the results separately for each education department.

If you would like to discuss the matter, or would like any further information, please do not hesitate to telephone me at 932-0311. You are also welcome to contact Professor Robertson at the number given at the top of this page.

If you would prefer your son or daughter NOT to participate in the research, please send the page accompanying this circular tot he school as soon as possible.

Thank you.

Yours sincerely

Dr A J Flisher

School HoR4

This letter was identical to that for School HoR2, except that the last paragraph was substituted by:

> If you would prefer your son or daughter not to participate in the research, please let Mr *** [the principal] know as soon as possible.

School HoR5

This letter was identical to that for school HoR2, except that the last paragraph was substituted by:

> If you would like to discuss the matter, or would like any further information, please do not hesitate to telephone me at 932-0311. You are also welcome to contact Professor Robertson at the number given at the top of this page. It would be appreciated if you

would return the reply slip to the school as soon as possible indicating whether you would like your son/daughter to take part.

School HoA6

This circular is in connection with a research project being undertaken by the Centre for Epidemiological Research in Southern Africa in collaboration with the Department of Psychiatry at the University of Cape Town. The research involves health related behaviour of Cape Peninsula high school pupils. *** high school is one of the schools that have been randomly selected from all the education departments in the Cape Peninsula. We intend to distribute a questionnaire to be filled in by the pupils at school; a wide variety of behavior is covered, including behaviour leading to traffic accidents and interpersonal violence, suicidal behaviour, abuse of cigarettes, alcohol and various other substances, and sexual behaviour. The language and terminology used for the questions on sexual behaviour are direct. The project is being carried out with the full support of the Cape Education Department. If there are questions which a pupil would prefer not to answer, he or she is perfectly free simply to leave those questions out. The results of the survey will be entirely anonymous in that it will not be possible to associate a response with a particular pupil; furthermore, it will not be possible to identify the schools involved. Each pupil will fill in their questionnaire privately, confidentially and anonymously and place it in an envelope which they will then seal and hand to us.

It is imprtant to bear in mind that the purpose of the research is to develop more effective guidance programmes. It is therefore of direct benefit to our young people.

You have been informed of the PTA meeting in the school hall on Wednesday, 20 June 1990. I will be available from 19:00 to 20:00 on that day in the media centre downstairs, to answer any queries you may have. If you would like to phone me at any other time in connection with the project, you may contact me at the number given at the top of the page. Please complete the reply slip indicating whether you have any objection to your son or daughter participating.

Thank you.

Yours sincerely

DR C. F. Ziervogel
Head: Child and Family Unit

School HoA10

This circular is in connection with a research project being undertaken by the Centre for Epidemiological Research in Southern Africa in collaboration with the Department of Psychiatry at the University of Cape Town. The research involves health related behaviour of Cape Peninsula high school pupils. *** high school is one of the schools that have been randomly selected from all the education departments in the Cape Peninsula. We intend to distribute a questionnaire to be filled in by the pupils at school; a wide variety of behavior is covered, including behaviour leading to traffic accidents and interpersonal violence, suicidal behaviour, abuse of cigarettes, alcohol and various other substances, and sexual behaviour. The language and terminology used for the questions on sexual behaviour is explicit. The project is being carried out with the full support of the Cape Education Department. If there are questions which a pupil would prefer not to answer, he or she is perfectly free simply to leave those questions out. The results of the survey will be entirely anonymous in that it will <u>not</u> be possible to associate a response with a particular pupil; furthermore, it will not be possible to identify the schools involved.

There will be a meeting at the school at 19h30 on 19 June 1990 when you willhave the opportunity of meeting members of the research team. If you are not able to attend the meeting, it would be appreciated if you would complete the attached reply slip indicating whether you have any objections to your son or daughter participating. If you would like to discuss the matter, you are very welcome to contact me at the number given at the top of the page.

Thank you.

Yours sincerely

Dr A J Flisher