AN INTER-RACIAL STUDY

OF

TRENDS IN PUBLIC HEALTH

IN THE CITY OF CAPE TOWN.

A Thesis submitted for

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by

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CONTENTS

		Page
Acknowledgements		i
List of Tables		v
List of Charts		ix
List of Appendices		x
CHAPTER I.	INTRODUCTION	1
	The epidemiological approach	1
	Cape Town as an epidemiological unit	2
	Scope and limitations of the study	4
	Methodology	5
CHAPTER II.	THE HISTORY AND SOCIAL BACKGROUND OF THE CITY OF CAPE TOWN	8
	Historical background of the people	10
	Social contrasts	12
	1. Socio-economic background	13
	2. Occupational background	15
	3. Housing	19
	4. Nutrition	21
	5. Social welfare services	22
	6. Education	24
	7. Health services	28
	8. Alcoholism and crime	35
CHAPTER III.	DEMOGRAPHY OF CAPE TOWN	38
	Demography and health	38
	Population growth of Cape Town	39
	Early growth	39
	Population growth in the 20th century	42
CHAPTER IV.	INTER-RACIAL COMPARISON OF FERTILITY	53
	Reproduction and health	53
	Birth rates in Cape Town	54
	Fertility rates in Cape Town	56
	Comparison with other populations	58
	Discussion	60
CHAPTER V.	COMPARISON OF MORTALITY TRENDS	64
	Mortality as a measure of health	64
	Crude mortality rates	66
	Sex, age and mortality	71
	Standardisation of death rates	84
	Discussion	85
	1. Biological factors	87
	2. Social factors	90
CHAPTER VI.	MATERNAL AND INFANT MORTALITY	98
	Maternal and infant mortality as indices of health	98
	Measures of maternal and infant mortality	98
	Maternal mortality trends	100
	Still-births and neonatal and infant mortality	104
	Still-birth rates	104
	Infant mortality rates	106
	Neonatal mortality	108

		Page
	Discussion	111
	(a) Biological factors	111
	1. Race	111
	2. Age and parity of mother	112
	3. Rapidity of breeding	114
	4. Multiple births	115
	5. Prematurity	116
	6. Other biological factors	119
	(b) Social factors	120
	1. Urban - rural differences	120
	2. Social class and socio-economic conditions	122
	3. Housing	126
	4. Nutrition	128
	5. Size of family	132
	6. Occupation of women	134
	7. Illegitimacy	134
	8. Availability and utilisation of medical services	138
	9. Maternal efficiency, intelligence and literacy	144
CHAPTER VII.	THE MEDICAL CAUSES OF DEATH : I. GENERAL TRENDS	147
	Trends of all ages combined	147
	Trends in infancy	154
	(a) In the first year of life	154
	(b) In the second year of life	162
	(c) Comparison of mortality in first and second years of life	163
	(d) Discussion	165
CHAPTER VIII.	THE MEDICAL CAUSES OF DEATH : 2. INDEX DISEASES	167
	1. Tuberculosis	167
	2. Diarrhoea and enteritis	192
	3. Enteric fever	200
	4. Cancer	202
	5. Coronary artery disease and angina pectoris	209
SUMMARY		227
APPENDICES		233
REFERENCES		248

TABLES

No.		Page
1	Planes of living of European and Coloured households in Cape Town 1938-39	14
2	Racial groups and employment categories in certain industries, South Africa 1937-50	16
3	Industrial distribution of workers in the Union of South Africa, 1921, 1936 and 1946	17
4	Occupational distribution of European and Coloured male adults in Cape Town 1938-39	17
5	Ethnic distribution of European and Coloured male adults within occupational groups in Cape Town, 1938-39	18
6	Percentage distribution of houses occupied by Coloured persons according to number of occupants per room, Cape Town 1921	19
7	Increases in population and housing - Cape Town 1915 to 1953	20
8	Dwellings erected by Public Authorities in Cape Town, 1920-1953	20
9	Average annual grants according to racial groups, South Africa 1950	23
10	Cape Town non-governmental social welfare organisations, 1939	24
11	Growth of state aided education in South Africa, 1936-1946	26
12	Free personal preventive health services available to the public in Cape Town	29
13	Utilisation of municipal personal preventive services, Cape Town 1937-38 and 1952-53	30
14	Free curative medical services available to the public in Cape Town	31
15	Hospital beds available and required in Cape Town 1951	32
16	Admissions to public general and maternity hospitals in the Cape Peninsula	33
17	Proportions of all deaths which occurred in institutions, Cape Town 1914-15 to 1952-53	33
18	"Rough census" of Cape Town - 1902	41
19	Population of Cape Town 1904	41
20	Birth places of the population, Cape Town 1904	42
21	Percentage of population of South Africa in urban areas at various times	43
22a	Urban and rural populations of Cape Province, 1936 and 1946	43
22b	Comparative growth of Cape Province and the City of Cape Town 1891-1946	44

No.		Page
23	Growth of population of Cape Town, 1891-1951	45
24	Relative growth of population by race groups, Cape Town 1921 to 1951	47
25	Sex ratios in Cape Town according to race, in age group 15-44 years	50
26	Age distribution of European and Coloured population of Cape Town, 1904-1951.....	51
27	Age distribution of populations of various countries	52
28	Crude birth rates, Cape Town, 1901 to 1953-54	56
29	Fertility rates in Cape Town by racial groups	57
30	Comparison of birth rates in various populations	59
31	Comparison of fertility rates in various populations	59
32	Crude mortality rates - Cape Town, 1901 to 1953-54	68
33	Crude mortality rates in various populations	69
34	Crude mortality rates by sex and race - Cape Town in various years	71
35	Proportions of deaths in various age groups	72
36	Percentage of total deaths in age groups	73
37	Age specific death rates - Cape Town, 1904 to 1951	74
38	Ratios of Coloured to European age specific mortality rates - 1904 and 1951	77
39	Age and sex specific mortality rates, Cape Town, 1926-1951	80
40	Comparison of death rates specific for age and sex in various populations	83
41	Ratios of male to female mortality - Cape Town 1926 and 1951	84
42	Comparisons of 1904 and 1951 mortality rates in Cape Town	85
43	Life expectation in various populations at birth and at one year	87
44	Standardised mortality ratios of men aged 20 to 64 by social class	91
45	Standardised mortality ratios of married women aged 20 to 64 by social class of husband	92
46	Mortality trends in Cape Town and England and Wales by race and class	94
47	Death rates for urban and rural areas in South Africa - Europeans	96
48	Maternal mortality rate in the city of Cape Town	100
49	Maternal mortality in various areas	101
50	Still-births and infant mortality - Cape Town, 1903-1953	103

No.		Page
51	Inter-racial comparison of numbers of still-births and still-birth rates, Cape Town, 1947-48 to 1952-53	104
52	Still-birth rates in various areas	105
53	Inter-racial comparison of infant mortality rates, Cape Town, 1938-1953	106
54	Infant mortality rates in various areas, 1921-1953	108
55	Ratio of neonatal to total infant deaths - Cape Town, 1913-1953	109
56	Neonatal mortality rates in various areas 1931-1953	110
57	Infant mortality rates in urban and rural areas for Europeans in South Africa	122
58	Deaths of married women per 1,000 legitimate live births from all maternal causes, England and Wales	123
59	Foetal and infant mortality - England and Wales, 1950, and Cape Town - 1948-53	124
60	Maternal death rate and still-birth and neonatal death rate per 1,000 births in two areas in South Wales	128
61	Illegitimate births as a percentage of all births, Cape Town, 1913-1951	136
62	Illegitimacy by racial groups - Cape Town, 1951-52 and 1952-53	137
63	Illegitimacy, still-births, and infant mortality - Cape Town, 1946-7 to 1952-3	137
64	Infant mortality rates in Cape Town 1951-52 and 1952-53 by race and legitimacy	138
65	Numbers and percentages of births in institutions by race Cape Town, 1947-48 to 1952-53	142
66	Causes of death by race in Cape Town, 1914-15 to 1952-53	148
67	Trends of mortality from different causes - Cape Town, 1914-15 to 1952-53	149
68	Ratios of Non-European to European crude mortality rates, Cape Town 1914-15 to 1952-53 by decennia	150
69	Comparison of mortality rates by causes, Cape Town and London	152
70	Infant mortality trends - Cape Town 1916-17 to 1950-51 ..	155
71	Trends of infant mortality from different causes, Cape Town 1916-17 to 1950-51 by quinquennia	158
72	Ratios of Non- European to European infant mortality from various causes, Cape Town 1916-17 to 1950-51	159
73	Infant mortality rates by race and cause, Cape Town 1948-49 to 1952-53	160
74	Incidence of congenital malformations as a cause of infant mortality, Cape Town 1936-37 to 1947-48	161

No.		Page
75	Mortality rates of infants 1 to 2 years of age, Cape Town 1926-27 to 1950-51	162
76	Trends of mortality from different causes for infants 1 to 2 years old, Cape Town, 1926-27 to 1950-51	163
77	Comparison of mortality rates and ratios for European and Non-European infants in the first and second years of life, Cape Town, 1926-27 to 1930-31 and 1946-47 to 1950-51	164
78	Deaths due to tuberculosis (all forms) as a proportion of all deaths, Cape Town 1937-38 to 1953-54	168
79	Deaths and crude mortality rates from tuberculosis (all forms), Cape Town 1913-16 to 1953-54	170
80	Inter-racial comparison of mortality rates for tuberculosis Cape Town 1937-38 to 1953-54	171
81	Comparison of crude mortality rates from all forms of tuberculosis in various populations	172
82	Sex differences in mortality rates from all forms of tuberculosis by race, Cape Town 1924-25 to 1952-53	173
83	Age specific mortality rates from all forms of tuberculosis Cape Town 1903-05 to 1950-52	176
84	Age and sex specific mortality rates from all forms of tuberculosis, Cape Town 1925-27 to 1950-52	177
85	Standardised mortality ratios by social class from respiratory tuberculosis in England and Wales	186
86	European mortality from tuberculosis in best and worst wards in Cape Town, 1944-45 to 1952-53	187
87	Notifications, deaths and admissions to hospital of tuberculosis patients, by race, Cape Town	190
88	Infant mortality from diarrhoea and enteritis, Cape Town, 1914-15 to 1953-54	193
89	Infant mortality from diarrhoea and enteritis by racial groups, Cape Town 1949-50 to 1953-54	194
90	Average annual mortality from diarrhoea and enteritis, infants 1 to 2 years of age - Cape Town	195
91	Average weekly deaths from diarrhoea and enteritis, infants 0 to 2 years of age, Cape Town, 1949-50 to 1953-54	196
92	Average annual mortality of infants aged 0 to 2 years from diarrhoea and enteritis, Administrative County of London	196
93	Infant mortality rates per 1,000 live births from gastro-enteritis, England and Wales - by social class of father	198
94	Incidence of and mortality from enteric fever, Cape Town, 1914-15 to 1953-54	201
95	Mortality from cancer by race, age and sex - Cape Town, 1935-37 to 1950-52	205
96	Deaths of persons over 74 years of age ascribed to "Senility" or "Ill defined causes", Cape Town, 1935-37 to 1950-52	206

No.		Page
97	Sex and age specific mortality rates from "All malignant diseases" - England and Wales, 1930-32 and 1949	207
98	Deaths from coronary artery disease and angina pectoris, Cape Town, 1935-37, 1945-47 and 1950-52	210
99	Mortality from coronary artery disease and angina pectoris by race, age and sex - Cape Town, 1935-37 to 1950-52	212
100	Sex ratios of mortality rates from coronary heart disease, Cape Town, 1935-37, 1945-47 and 1950-52	214
101	Secular trends in mortality from coronary artery disease and angina pectoris in Cape Town by race, age, and sex ...	215
102	Comparison of age specific death rates from coronary disease - Cape Town, England and Wales, and United States	216
103	Standardised mortality ratios for coronary heart disease by social class, England and Wales	219
104	Smoking habits of working men aged 40-58, Cape Town, 1955	221

C H A R T S

1	Cape Peninsula showing extent and development of Cape Town Municipal area	9
2	Population growth, City of Cape Town, 1891-1951	46
3	Population pyramids, Cape Town 1904-1951	48
4	Crude birth rates Cape Town 1902-1953	55
5	Crude corrected death rates Cape Town 1903-1953	67
6	Age specific death rate trends, Cape Town 1904-1950	75
7	Ratios of Coloured to European mortality rates by age groups, Cape Town 1904 and 1951	78
8	Still-birth, neonatal mortality and infant mortality rates. Five yearly averages for Europeans and Non-Europeans, Cape Town, 1903-1953	102
9	Infant mortality trends for six main causes of death - Cape Town 1915-16 to 1950-51 (quinquennial averages).....	156
10	Infant mortality rates Europeans and Non-Europeans, Cape Town, 1916-1951	157
11	Mortality rates for tuberculosis (all forms) Cape Town and London. Quinquennial averages up to 1946-51	169
12	Trends of mortality from tuberculosis (all forms.) Cape Town, 1937-38 to 1952-53. By sex and race	174
13	Mortality rates from all forms of tuberculosis (by race, sex and age). Cape Town 1925-27 and 1950-52	178
14	Mortality rates from all forms of cancer by race, sex and age Cape Town, 1935-37, 1945-47, 1950-52	204

No.		Page
15	Mortality rates from coronary artery disease and angina pectoris by race, sex and age. Cape Town, 1935-37, 1945-47, 1950-52	213

APPENDICES

A	Population of Municipality of Cape Town at various censuses, 1904-1951	233
B	Corrected births and birth rates, Municipality of Cape Town, 1901-02 to 1953-54	239
C	Corrected deaths and death rates, Municipality of Cape Town, 1901-02 to 1953-54	241
D	Standardisation of mortality rates, Municipality of Cape Town, 1904 and 1951	243
E	Infant deaths and mortality rates, Municipality of Cape Town, 1901-02 to 1953-54	246

CHAPTER I

INTRODUCTION

THE EPIDEMIOLOGICAL APPROACH.

This thesis is a study of the epidemiology of the City of Cape Town during the first half of the present century. In a sense it is an expansion and continuation of an investigation by Brock (1949) into the pattern of health and disease of the Cape Coloured people which he presented to the Medical Congress of the South African Medical Association held at Cape Town in 1949.

Epidemiology, derived from the Greek and meaning "upon the people", used to be limited to the study of epidemics and quite commonly to the study of the way in which infectious diseases affected the community. In recent years the epidemiological approach has been applied to endemic diseases and to non-infectious conditions such as pellagra, industrial diseases, cancer and coronary heart disease. Some workers apply the methods of epidemiology to social conditions such as poverty, housing, and family life, and there is evidence that we are now moving to the more complex consideration of the epidemiology of health. (Pearse and Crocker, 1943; Merrell and Reed, 1949; Galdston, 1953).

The essential feature of the epidemiological method is that it takes the group as its unit of study, whereas clinical medicine studies the individual. In epidemiology the state of the individual is considered only in relation to his group, and in this way we obtain a measure of the health or morbidity of the group.

In clinical research the observations are usually made by the investigator himself, but in these days of complex investigation he may have to rely upon a number of technical assistants such as radiologists, biochemists, nurses, medical social workers, etc, whose results he uses. In an epidemiological study, where the unit is a whole community, the observations used are often those provided by census enumerators, registrars of births and deaths, medical attendants, medical officers of health and sociologists, all of whom act as the intelligence service of

research worker.

The group which is studied may be a biological one, defined by sex, age, or racial origin, or it may be limited by geographical, economic, occupational, educational or other social considerations. It is necessary also to define the time of observation because of the rapidly changing circumstances of modern communities.

Epidemiology can therefore be defined as the study of health and disease of specific groups of people at specific periods in relation to their biological and environmental circumstances.

The epidemiological method provides community diagnoses which form the basis of scientific assessment of the effects of changes in the environment and ways of living.

The modern epidemiologist at present is investigating the effects on health of such diverse conditions as "smog", an increase of fat in the diet, circumcision, the tendency for women to work outside of the home, smoking of cigarettes, the changing age distribution of the population, etc. He aims to assess the efficacy of public health and social and therapeutic measures. He tries to isolate special health problems and select groups who require priority attention either in research or treatment. By revealing differences in various groups he is often able to postulate new aetiological factors in disease. By studying whole communities instead of only those who present themselves or who are presented to the clinician or pathologist, the epidemiologist can often "fill in the clinical picture" (Morris, 1955). In numerous ways the work of the clinician, the public health worker, the statesman and the epidemiologist are complementary to each other.

Although this study raises more questions than it answers, it is hoped that it will be of some value to those who are interested in preventive and social medicine and in the great task of improving human health and happiness.

CAPE TOWN AS AN EPIDEMIOLOGICAL UNIT.

The City of Cape Town presents some valuable opportunities for an epidemiological study. Cape Town is a city of just under half a million inhabitants. Approximately one half of the population is ethnically "European" or "White". Their social conditions have kept

pace with those to be found in North Western Europe, North America and other "western" communities. The other half of the population is officially called "Non-European" and their social conditions have been similar to those of technically less advanced communities. The vital statistics of the Non-Europeans have been similar to those of western communities of some decades ago or of communities in the less advanced areas of the world to-day. These two sections of the city's population therefore provide a suitable basis for a comparative study in public health.

The Non-European half of Cape Town's population has always been predominantly "Coloured". In the 1936 census the Coloured people constituted 88 per cent of the Non-Europeans of the city, and in 1951, despite considerable increases in the numbers of Natives, they still formed 81 per cent of the Non-European population.

As will be seen later, the Coloured people are culturally very much a part of Cape Town and are socially very close to the Europeans. The two other elements of the Non-European section, the Natives (Bantu) and the Asiatics (mainly Moslem Indians) are comparative newcomers to Cape Town and they differ socially from the Europeans to a far greater extent than the Coloured people do.

The City of Cape Town is fortunate in that since the appointment of Dr Jasper Anderson as first full-time Medical Officer of Health in 1901 there have been annual reports on the public health of the city which have been of a consistently high standard. Statistics have been given annually separating "Europeans" from "others". Since 1938 these statistics have been provided to an increasing extent separately for Coloureds, Asiatics and Natives. Because of this, it is frequently possible to continue the comparison between European and Coloured despite an increasing proportion of Natives among the Non-European group in recent years.

Cape Town is fortunate too in that a number of social surveys have been carried out in the city. These surveys provide a considerable part of the social background against which we can study the public health of various groups of people.

There is one other feature of Cape Town which makes it more

suitable than many other cities in Africa or other continents for a comparative study of this nature. The city is situated 10 degrees south of the Tropic of Capricorn and has a temperate climate; tropical diseases, except for imported cases, are therefore not seen among the inhabitants, and they do not complicate the epidemiological picture.

SCOPE AND LIMITATIONS OF THE STUDY.

It is my plan therefore to review the socio-economic backgrounds of Europeans and Non-Europeans in Cape Town, and thereafter to compare their public health experiences over the past half century. Wherever possible the Non-European statistics have been separated for the three component groups.

This study, however, has certain limitations which must also be mentioned. Because of the paucity of data concerning morbidity, comparisons will be made almost entirely on the basis of mortality, though where relevant and available, other data will be used too; nevertheless much valuable information has not been analysed. Although mortality figures are generally reliable the certified medical causes of death always have to be accepted with caution. Many doctors' diagnoses have to be based on clinical findings only, and are made under extremely difficult conditions, so that the accuracy of diagnosis of cause of death must vary considerably. As will be seen later the proportion of Non-European deaths which occurred in hospitals or other institutions was far smaller than that of Europeans. It is likely therefore that the accuracy of diagnosis of the cause of death was greater for Europeans than for Non-Europeans.

Another difficulty encountered when studying trends of disease arises from changes either in diagnostic fashion or in our ability to recognise certain diseases. This may result from advancing medical knowledge about disease syndromes or the availability of diagnostic facilities. Thus in the earlier years of the century "coronary thrombosis" was not distinguished from other forms of cardiac disease. In recent years coronary thrombosis has become so well recognised that it is possible that this diagnosis is now being made more frequently than it does in fact occur.

Another source of error in calculating vital statistics is

the incomplete registration of births. There is good evidence to suggest that the registration of births in Cape Town, especially among Natives, is not complete. In addition census figures are also liable to error by under-enumeration, and it is likely that this error is largest among the Native section of the community. These problems will, however, be discussed in later sections.

It may be asked whether it is worth while analysing the vital statistics of the city of Cape Town when there are so many sources of error. In the author's opinion the effort is justified for several reasons. Despite the shortcomings of the raw data, they are among the best sources of epidemiological information available for an inter-racial comparison. Although there is an increasing use of this kind of statistics overseas, this is the first study of its kind in South Africa and only by experimenting with the available tools can one learn how to develop better ones. Although we know that there are considerable margins of error in radio-diagnosis, haematology and biochemistry, for instance, we do not hesitate to employ their techniques while more accurate methods are being developed. As long as the deficiencies of the basic data are kept well in mind rash conclusions will not be drawn.

METHODOLOGY.

The physical, historical and social backgrounds of the various racial groups in Cape Town have been outlined to provide a picture of the environment of the different populations which are to be studied.

Various indices of health, suitable for inter-racial comparison have been selected. The indices of the racial groups have then been measured against each other as well as against statistics from other communities. The findings have then been discussed in the light of other selected reports and investigations.

The raw materials of this study have been the available health, census and social reports. These have had to be refined, integrated, and arranged to provide more orderly measures of the trends of health in relation to race, age and sex. Where possible the evidence for biological as well as environmental influences in producing inter-racial differences in health have been evaluated.

The statistical terms and techniques used have been those

outlined by Hill (1955).

In most of the charts prepared to illustrate trends of various sorts, a semi-logarithmic scale has been used. The advantage of doing so is that with such a scale a straight line in the graph indicates a constant proportionate change, and trends, rather than absolute levels, are thereby emphasized.

DEFINITION OF TERMS.

It should be noted that in this study the term "race" is used in the loose manner common in South Africa, and is based mainly on the continent of origin or the colour of one's ancestors.

Racial groups: in South Africa four main racial groups are officially recognised, namely, Europeans (or "Whites"), Coloureds (or "Mixed"), Asiatics, and Natives (or Bantu). Frequently the three latter groups are classed together as "Non-Europeans". In this study the officially used terms "European", "Coloured", "Asiatic" and "Native" are generally used, even though their use is open to various criticisms.

No consistent or precise definitions are available, and even the makers and interpreters of laws in South Africa frequently have difficulty in forming definitions; indeed the definitions are different in form for various Acts of Parliament. (Patterson, 1953, pp. 361-363).

Broadly speaking, however, the European population consists of people whose ancestors came from various European countries and who are in appearance considered European or "White" and socially accepted as such. Nevertheless, it is well known that there has been much"passing over" in South Africa as is to be expected where whites and non-whites have been in close contact for 300 years.

The Coloured people (usually defined legally by exclusion) can be accepted as being of mixed ethnic origin and descended from various indigenous and imported groups including Europeans. Their origin and history will be discussed briefly later.

The Natives, who are also referred to as "Bantu" or "Africans" consist of various tribes of indigenous groups of Southern Bantu. The "Asiatics" consist predominantly of Moslem Indians in Cape Town, but there are a small number of Chinese as well.

"Cape Town" is used to denote the municipal area of the city

as officially defined from time to time. Where the area and population of the municipality as well as the surroundings which sociologically form Cape Town is intended, then the term "Greater Cape Town" is used.

REFERENCES TO LITERATURE.

For the sake of convenience and brevity two conventions have been adopted in the writing of this thesis.

In place of "Corporation of the City of Cape Town, Annual Report of the Medical Officer of Health for the year ended 30th June, 1953" I have used the abbreviated reference "M.O.H., Cape Town, 1952-53", and similarly for Annual Reports of other years.

Reports issued by various Government Departments and Commissions of Enquiry and other Union of South Africa Government Blue Books are referred to in the text merely by their official numbers, for example, "U.G. 71/1951". Their full titles are given in the list of "References".

CHAPTER II

THE HISTORY AND SOCIAL BACKGROUND OF THE CITY OF CAPE TOWN

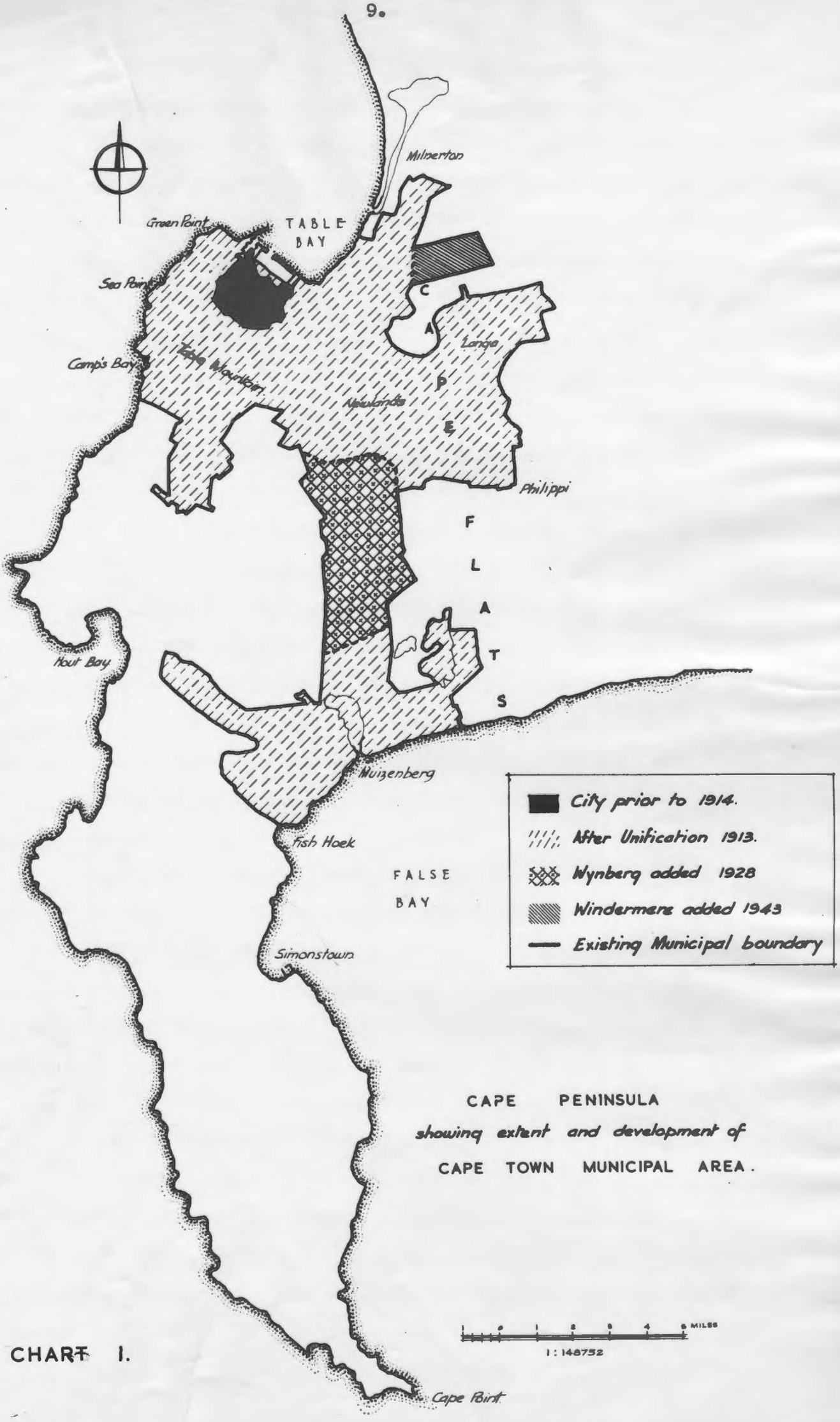
Though founded 186 years earlier, Cape Town was first officially proclaimed a municipality in 1838. The older central portion of Cape Town lies in the amphitheatre which is backed by Devil's Peak, the precipitous northern face of Table Mountain, Lion's Head and Signal Hill. The suburbs extend beyond this amphitheatre on either side. To the west the "Marine Suburbs" lie along the Atlantic seaboard for about six miles curving with the coast in a southerly direction. To the east the "Southern Suburbs" curve around Devil's Peak and extend for 16 miles along the mountain slopes and the western margin of the Cape Flats to the shores of False Bay. (Chart I).

The municipality also extends across the Cape Flats for several miles in a north-easterly direction and includes a number of industrial suburbs and areas where housing and social conditions are extremely poor.

The suburbs developed into a series of municipalities, all but one of which amalgamated with central Cape Town in 1913 to form the "City of Cape Town". In 1928 the one remaining municipality, that of Wynberg, was incorporated into the City as well. In 1943 the municipal boundaries were extended again to include Windermere, a peri-urban area occupied by several thousand people, mainly Non-Europeans, living in slum conditions.

In 1953 the area of the City was estimated to be 81.7 square miles and the length of the main road passing from one boundary to the other was 26 miles. Although until recently there were no legal provisions for residential segregation, the Coloured and the European elements generally lived in fairly well defined but contiguous areas, in much the same way that poor and well-to-do would be separated in any city in Europe.

Cape Town is situated well out of the tropical zone and its climate is temperate. The rains fall mainly in winter and the temperature



CAPE PENINSULA

showing extent and development of

CAPE TOWN MUNICIPAL AREA.

CHART I.

is equable. Tropical diseases, so common in most of the African continent, are therefore absent except for rare imported cases.

The climate, the great natural beauty, the seaboards, and the cultural amenities of Cape Town make it a popular holiday resort and tourist centre. The functions of the city as a seat of government, as well as the presence of an important harbour of strategic value have played a large part in determining its social and economic history.

HISTORICAL BACKGROUND OF THE PEOPLE.

The history of Cape Town and the Cape of Good Hope has been told by many writers starting with its founder Jan van Riebeeck himself. It is necessary only to mention a few of the facts which are of interest and relevant to this study.

In 1651 van Riebeeck was instructed by his masters, the Dutch East India Company, to establish a garden and a fort to ensure a supply of fresh food and water for the Company's ships on their way to and from the East. This was necessary because of the high incidence of scurvy among the crews of the sailing ships in the seventeenth century. It is ironical that 300 years later in the city founded upon the site of van Riebeeck's garden the incidence of malnutrition should still be high, and scurvy is still by no means a rare disease.

The Cape Coloured.

According to Marais (1939, Chapter I), the Cape Coloured people are descended from the following ethnic elements:-

(1) Slaves: the great majority of slaves came from Madagascar, India, Ceylon, Malaya and Mozambique, but one shipload was imported by van Riebeeck from West Africa. One group, the Malays, have kept apart, but they are to-day more a religious than an ethnic entity.

(2) The Hottentots, with whom the Dutch settlers came in contact in the earliest days of the settlement, were reported to have been a mild people. The Dutch East India Company traded with them for land and cattle, and opportunities for social contacts were frequent.

(3) The Bushmen, on the other hand, resisted the Dutch advances to a far greater extent and rarely had friendly contact with the white settlers.

(4) Bantu: Unions of Bantu with Europeans or other racial groups

have been more frequent in Natal and other Northern areas of South Africa; consequently the Bantu have not contributed materially to Cape Coloured stock except in recent times.

(5) Europeans: From the early days of the Dutch settlement there have been unions between Europeans and slaves and Hottentots. Unions between European men and Non-European women in the Colony were made more likely by the prolonged shortage of European women especially in frontier areas. Apart from the European settlers at the Cape, European soldiers and sailors passing through and stationed at Cape Town were responsible for the birth of many Coloured children.

It should be noted that the Coloured people began to develop as a group in Cape Town shortly after the European settlers arrived. Although the majority of them were either slaves or servants, they lived in close proximity to the Europeans. The Coloured people were an essential part of the economic life of the Cape, and they were the artisans and craftsmen of the growing community.

Their language has for hundreds of years been that of their masters - Dutch, Afrikaans or English. Their religions, except for the relatively small Malay group, have been those of the white people. Apart from the Malay group, the Coloured people's culture over the last 300 years has been that of the Europeans because they had no real culture of their own.

To quote from the conclusion of an authoritative history, "The Coloured do not appear to differ from us (Europeans) to-day in anything except their poverty, and that they share with our large army of poor whites. As far as 'civilised standards' are concerned, all that need be said is that many of the Coloured live in a more 'civilised' way than many Europeans in South Africa". (Marais, 1939, p. 281).

The Asiatics.

The Asiatic group in Cape Town has always been relatively small. In the censuses of 1904 and 1911 they were enumerated with the Coloured population. They are in Cape Town almost entirely Moslem Indians and shopkeepers who have settled here since the beginning of the twentieth century. By language, religion, and culture, they are very different from most of the other Non-European groups, although a number

of the Indian men have in recent years married Malay women.

The Natives.

The majority of the Natives in Cape Town are also comparative newcomers to the area. Although there were a few thousand of them (mostly males) enumerated in the 1904 census they were mainly migrant labourers whose homes and social and cultural ties were in the Native territories, 500 or more miles away. Of recent years an increasing number of Native women have been settling in Cape Town and a growing community of detribalised Natives and their families is developing in the city. However, many Natives, especially among the "migrant labour" class, still do not regard Cape Town as their home, and they frequently return to their ancestral kraals to rejoin their families to maintain their kinship ties or in times of stress.

The Europeans.

The history of the white settlers in the Cape is well outlined by Marquard (1954). He shows how they spread inland from the Mother City in search of pastures, land, and freedom from interference, first on the part of the Dutch East India Company and later on the part of the British Government. The original Dutch colonists were later reinforced by Huguenot refugees, and settlers from Britain and elsewhere in Europe.

The mixed origin of the European portion of Cape Town's population is discussed more fully later. The discovery of diamonds and gold in South Africa in the nineteenth century and two world wars stimulated the development of South African industries. In the past 40 years, in common with trends in other countries, industrialization and urbanization have developed rapidly. An increasing number of Europeans are returning to the Cape Town from whence their ancestors had trekked some generations earlier.

SOCIAL CONTRASTS.

The historical background of the Cape explains how it came about that Europeans and Coloured people in Cape Town were traditionally in the relationship of masters to servants. This relationship is founded not only on the basis of social and economic class, but also on the basis of colour which immediately imposes a certain status upon the individual. In South African society Non-Europeans, no matter what their personal

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qualities, are largely limited to certain occupational groups, and suffer from a number of economic, political and educational restrictions. (U.G. 53/1948). These distinctions of colour accentuate social differences and facilitate a study of socio-medical problems.

Politically Cape Town has had a traditionally liberal attitude towards her Coloured citizens, and her City Council usually includes several Coloured members among its number. Nevertheless, it is evident that the great majority of Coloured people in the city occupy a considerably lower socio-economic position than the majority of Europeans do. This socio-economic difference between the races requires no scientific investigation for its demonstration. But it is worth while reviewing the situation to see the extent of these differences, and to see if and how these differences are changing with the passage of time.

A number of reports of Government and other official committees investigating health and living conditions of the Coloured people have been published. These reports provide valuable data concerning the social and economic background to health in South Africa and Cape Town, and will be freely quoted from.

I. SOCIO-ECONOMIC BACKGROUND.

Batson (1942a) reported that "a household inquiry showed that in the Municipality of Cape Town in 1938-39:

1. One in every four households was below the Poverty Datum Line.

2. Of every ten households below the Poverty Datum Line, eight were Coloured, one Native and one European.

3. Of every ten Coloured households, five were below the Datum Line; of every ten Native households, five; of every ten Asiatic households, two or three; of every ten European households, less than one. "

The Poverty Datum Line was defined as "that expenditure which is necessary to procure at the current prices of the district, those quantities of food, clothing, fuel, and lighting and cleaning materials which are essential for the health and decency of the members of a given household". A household whose "Available Income" (i.e. gross household income minus the costs of rent and workers' travelling to and from work)

exceeds this expenditure is "above the Poverty Datum Line". A household whose Available Income falls short of this expenditure level is "below the Poverty Datum Line" or "in poverty".

On the basis of this survey it can be concluded that in 1938-39 about half of the Coloured and the Native households in Cape Town could not afford the basic necessities of life - even assuming that income was spent in the wisest and most economical way.

Batson also compared the planes of living of the Europeans and Coloureds on the basis of the survey. (Table 1).

TABLE 1

PLANES OF LIVING OF EUROPEAN AND COLOURED HOUSEHOLDS IN CAPE TOWN, 1938-39

PLANE OF LIVING	EUROPEAN HOUSEHOLDS Number	Percentage	COLOURED HOUSEHOLDS Number	Percentage
"Destitution"	Less than 300	Less than 2	700 ± 300	3 ± 2
"Acute Poverty"	Less than 500	Less than 2	4,300 ± 700	17 ± 2
"Need"	1,100 ± 400	4 ± 2	8,200 ± 1,000	35 ± 3
"Not below P.D.L."	29,000 ± 500	95 ± 2	11,900 ± 1,600	47 ± 4
All planes	30,500	100	25,000	100

Source: Batson (1942a).

Batson (1954) subsequently reported on a follow-up survey on the socio-economic condition of the Coloured people in Cape Town in 1951. He concluded that there was a marked improvement on the levels previously found in the 1938 survey. This was due to "a trebling of incomes which, together with relative stability of rents, much more than offset the increase in the price of food and other necessaries and the increased expenditure on transport". In 1938 the percentage of Coloured households with available income levels less than the Poverty Datum Line was 52; in 1951 the percentage of such households was 33. This improvement in income was partly due to the rise in the average number of earners per household from 1.6 to 2.1 As there was little, if any,

change in the size or structure of households, it was considered likely that there was an extension of the category of earners within households such as would arise if relatively more wives were working. Individual wages, in terms of 'real' money, were considered to have remained stable, having risen to the same degree as the cost of living. Although the proportion of Coloured households in poverty fell, the Coloured population increased, so that the total number of households in poverty, which was about 13,000 in 1938, was still about 11,000 in 1951. The number above the poverty datum line increased from about 12,000 to at least 21,000. The number of households with incomes well above the poverty level (Available Income Ratio above 300) increased three or four fold.

In the survey Batson does not enquire into the effects on the Coloured people of unemployment in 1938 and 1951. It is likely that the post-war boom and industrial expansion went far to improve the earning capacity of the Coloured worker. In addition, the controlled influx of Natives to Cape Town in such a period may possibly also have affected the labour market in favour of the Coloured workers.

II. OCCUPATIONAL BACKGROUND.

The occupational restrictions which Non-Europeans are subject to in South Africa are described by the Social and Economic Planning Council (U.G. 53/1948). The effects of the conventional "Colour Bar", industrial legislation, "Pass Laws", "Apprenticeship Act", and the lack of education among Non-Europeans are outlined in Report No. 13 of this Council (pp. 31 et seq).

In South Africa "the type and grade of work done by individuals, and hence the wages earned, are determined by their racial group as much as by their individual aptitudes and preferences. On the one hand, opportunities for employment are different for members of different racial groups. On the other hand the quality of work performed is affected by the unequal opportunities open to the different groups in respect of employment, wages and living conditions in general. Capacity and willingness to work are also affected by the different educational facilities available for members of different groups". (Van der Horst, 1954). Although there is no legal colour bar, it is difficult for

Non-Europeans to enter most of the professions. In 1936, of 9,152 doctors, lawyers, dentists, chemists, architects and engineers, 9,090 were Europeans, 25 Asiatics, 23 Coloured and 14 Native. Until the recent industrial expansion Natives were practically confined to unskilled manual work. The Coloured people occupied an intermediate position between the Europeans and Natives and many of them followed their slave ancestors as masons, painters, furniture makers and other skilled workers in the older trades. (Van der Horst, 1954).

In industries investigated by the Wage Board between 1937 and 1950, the proportions of skilled, semi-skilled and unskilled workers are shown in Table 2.

TABLE 2.

RACIAL GROUPS AND EMPLOYMENT CATEGORIES IN CERTAIN INDUSTRIES, SOUTH AFRICA, 1937-50.

(a) Percentages according to skill.

Category	European	Coloured	Asiatic	Native
Skilled	82.5	15.2	33.0	4.2
Semi-skilled	15.5	29.8	31.4	12.2
Unskilled	2.0	55.0	35.6	83.6
Total	100.0	100.0	100.0	100.0

(b) Percentages according to racial group.

Category	European	Coloured	Asiatic	Native	Total
Skilled	83.6	5.0	5.6	5.8	100.0
Semi-skilled	32.9	20.7	11.2	35.2	100.0
Unskilled	1.5	13.0	4.3	81.2	100.0

Sources: U.G. 71/1951. Table 34, quoted by Van der Horst, 1954.

Although this analysis did not include some of the industries such as that of building or clothing and furniture manufacture, where the proportion of Coloured skilled workers was considerable, it gives an idea of how occupation and race are related in South Africa.

Changes in the distribution of occupation among Europeans and Coloured workers in the Union are illustrated by Table 3.

TABLE 3.

INDUSTRIAL DISTRIBUTION OF WORKERS IN THE UNION OF SOUTH AFRICA 1921, 1936 and 1946. (Percentages).

	EUROPEANS			COLOURED		
	1946	1936	1921	1946	1936	1921
Forestry, farming, fishing.	18.9	24.5	31.6	27.9	34.2	36.5
Manufacturing industry.	21.4	17.9	12.3	22.0	16.8	13.5
Personal service	2.8	4.1	4.0	21.4	25.8	28.5
Other industries	56.9	53.5	52.1	28.7	23.2	21.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: U.G. 62/1951. Table 18 (modified).

This table illustrates how markedly both European and Coloured workers are moving from agriculture to manufacturing, and is an index of industrialization and urbanization. The reduction of Coloured workers providing personal service is also noteworthy.

The occupational distribution of European and Coloured male adults in Cape Town in 1938-39 was investigated by the Social Survey of Cape Town. (Batson, 1942a.) The results of their survey are shown in Tables 4 and 5.

TABLE 4.

OCCUPATIONAL DISTRIBUTION OF EUROPEAN AND COLOURED MALE ADULTS IN CAPE TOWN. 1938-1939.

Occupational Group	Male adults : Percentage distribution			
	EUROPEAN		COLOURED	
Professional	8	47	0	5
Business	20		4	
Clerical	19		1	
Supervisory manual	5	22	1	13
Skilled manual	17		12	
Semi-skilled manual	16	21	26	68
Unskilled manual	5		42	
Non-earners	10		8	
Unemployed	1		6	

Source: Batson (1942 a)

TABLE 5

ETHNIC DISTRIBUTION OF EUROPEAN AND COLOURED MALE ADULTS WITHIN OCCUPATIONAL GROUPS IN CAPE TOWN, 1938-39

Occupational group	Male adults in the labour market : Percentage distribution		
	EUROPEAN	COLOURED	TOTAL
Professional	97	3	100
Business	90	10	100
Clerical	97	3	100
Supervisory manual	92	8	100
Skilled manual	70	30	100
Semi-skilled manual	52	48	100
Unskilled manual	18	82	100
Unemployed	20	80	100
All	63	37	100

Source: Batson (1942a)

These figures illustrate the considerable ethnic differences in occupation distribution which existed in Cape Town in 1938-39. More recent figures concerning ethnic distribution in the occupational groups in Cape Town are not available.

Women in industry.

The employment of women in industry has increased considerably from 1938-39 to 1948-49. In the Western Cape area, which includes the Cape Peninsula as well as the surrounding magisterial districts of Bellville, Hopefield, Malmesbury, Paarl, Somerset West, Stellenbosch and Wellington, the number of European women employed in factories has increased from 6,344 to 7,045 in this ten year period. In the same period the number of Coloured women so employed has increased from 7,305 to 17,380. (Van der Horst, 1954). This large increase in Coloured women working in factories in the Cape Western area probably explains a part of the increase in the average number of workers per family and the rise in household incomes noted by Batson (1954) and previously mentioned.

III. HOUSING.

In his first annual report Dr A.Jasper Anderson, Medical Officer of Health to the City of Cape Town, wrote: "There is a decided deficiency in the houses required by the people who wish to reside in the City, and especially for the mass of the working classes. This has existed for some considerable time, and private enterprise does not seem to step in and supply the want. Under these circumstances I am of opinion that the Corporation ought to build a number of houses intended for the working classes, and in this way make an attempt to some extent to supply the deficiency". (M.O.H. Cape Town, 1901-2).

There were two earlier surveys of housing conditions in Cape Town, but the earliest comprehensive one was published in 1924. (Table 6).

TABLE 6

PERCENTAGE DISTRIBUTION OF HOUSES OCCUPIED BY COLOURED PERSONS ACCORDING TO NUMBER OF OCCUPANTS PER ROOM, CAPE TOWN, 1921

AREA	NO. OF HOUSES	OCCUPANTS PER ROOM					
		Less than 2	2-2½	2½-3	3-4	4 and over	Total
Cape Town Municipality	8,953	25.29	19.77	11.79	23.17	19.98	100.00
Wynberg + Municipality	1,678	32.42	21.63	11.98	20.38	13.59	100.00

+ Wynberg Municipality was incorporated into the City of Cape Town in 1928.

Source: Director of Census, Special Report Series No. 8, 1923. Quoted by M.O.H., Cape Town, 1923-24, p. 50.

At the same census it was found that in Cape Town 29.5 per cent of Europeans occupied houses with over two persons per room, whereas 85 per cent of Coloured people lived under such conditions.

After 1921 the housing position for the poorer sections of the population deteriorated even further. As a result of the rising costs of building, private enterprise concentrated on the constructions of expensive dwellings mainly for the higher income groups. Public authorities, on the other hand, have for various reasons not been able to

satisfy the housing needs of the lower income groups.

The numbers of new dwellings as compared with the growth of population in Cape Town are shown in Table 7.

TABLE 7

INCREASES IN POPULATION AND HOUSING - CAPE TOWN, 1915 TO 1953

Period	Population increase (a)	Dwellings completed (b)	Ratio of (a) to (b)
1915-19	21,210	485	43.7
1920-24	25,270	1,643	15.4
1925-29	26,790	4,073	6.6
1930-34	29,760	6,765	4.4
1935-39	26,470	7,358	3.6
1940-44	36,470	6,294	5.8
1945-49	54,200	5,362	10.1
1950-53	51,320	2,973	17.3
Total 1915-53	271,490	34,953	7.8

Source: M.O.H., Cape Town, 1952-53, p. 75

During the period 1920 to 1953 public housing authorities completed over 9,000 dwellings in Cape Town and suburbs. This was exclusive of Langa Native Township which in 1953 housed about 11,000 Natives. The distribution of these houses is shown in Table 8.

TABLE 8.

DWELLINGS ERECTED BY PUBLIC AUTHORITIES IN CAPE TOWN, 1920-1953.

		European	Non-European	Total
(a)	Within Cape Town Municipal Area			
	1. City Council	1,046	4,857	5,903
	2. Citizens Housing League Utility Company	942	28	970
	Total	1,988	4,885	6,873
(b)	Outside Municipal Area			
	Citizens Housing League Utility Company	2,079	400	2,479
	TOTAL	4,067	5,285	9,352

Source: M.O.H., Cape Town, 1952-53, p. 75.

In the household inquiry carried out by the Social Survey of Cape Town in 1938-39 it was found that, "judging by a very simple and tolerant standard of occupancy, one Coloured household in three was overcrowded, and one European in thirty. The application of a somewhat stricter standard left the European figure practically undisturbed, but raised the Coloured figure to 43 per cent". (Batson, 1942 a).

Since 1938 the housing position has deteriorated even further. This is due to natural increase in population and increased urbanization combined with the slowing down of building during the war and post-war periods as a result of shortages of labour and materials. In 1951 "the number of applications on the waiting list for tenancies in the City Council's sub-economic housing estates exceeded 8,000. In addition there were thousands of families living in overcrowded and slum-like conditions who have not considered it worth while to apply". (M.O.H., Cape Town. 1950-51, p. 4.)

This deterioration in the housing position is reflected by the results of the Social Survey of Cape Town (Batson, 1954) inasmuch as the percentage of Coloured households overcrowded increased from 38 to 44 during the period 1938 to 1951.

There are no comparable figures for European housing, but owing to the large numbers of dwellings that have been completed for the high income groups, and the superior economic position of the Europeans generally, it is likely that their housing position has either remained stationary or even improved.

IV. NUTRITION.

There is little direct statistical evidence upon which to base a comparison of the nutritional status of the European and Non-European populations of Cape Town.

The Cape Nutrition Survey (Brock and Latsky, 1942), on the basis of a comprehensive investigation of 841 Coloured children from selected schools, found that the percentages of diseased, malnourished and normal children were 8.4, 48.6 and 43.0 respectively. In 378 children from four European schools the percentages of malnourished children ranged from 17 to 65.

In a survey in 1940-41 directed by Batson (1942 b) the food

consumption of 84 randomly selected Coloured households was investigated. Of these, 78 households provided data adequate for dietary analysis. On the basis of the British Medical Association Nutritional Standard (No. 2) it was concluded that 87 per cent of the diets provided insufficient calories, and half of them supplied less than 60 per cent of the calories required. Protein was deficient in 82 per cent, and fat in 80 per cent of the diets.

These studies do not provide a basis for a comparison of the nutrition of Europeans and Non-Europeans in Cape Town. However, the contrast of socio-economic conditions among the two main sections of the population makes it certain that Europeans are far less affected by undernutrition than Non-Europeans are. If any further proof of this statement were needed, the far greater incidence of clinical signs of malnutrition to be seen in Non-European patients in the hospitals of Cape Town could be cited.

V. SOCIAL WELFARE SERVICES.

The modern trend in social welfare policy is away from the charity and relief work of the nineteenth century and towards constructive and rehabilitative work. "In its widest interpretation, social welfare involves adequate health services, housing, and educational, cultural and recreational facilities for all groups in the community, and is also concerned with enabling each individual to develop his full potentialities and capacity for the benefit of the society in which he lives". McIver, 1948, p. 331). Social welfare services as defined by McIver are provided by a large number of government departments and private and semi-private bodies.

Some measure of the benefits received by the various racial groups is provided by the figures reflecting the expenditure of public money on social security services such as pensions, grants and allowances. According to the Report of the Social Security Committee in 1945: "social assistance and social insurance, national and voluntary, now cost some £9,750,000 a year. This amount includes poor relief; it excludes grants-in-aid and war pensions. Of the total yearly sum, £8,300,000 goes to Europeans; Coloured and Asiatics get £800,000; Natives £600,000. The Central Government bears about half the cost, employers a third,

employees an eighth. The money value of charitable effort is relatively small". (U.G. 14/1944, par. 15).

In terms of money per head of population this represented an approximate annual expenditure per head of £4 for Europeans, £1 for Coloureds and Asiatics, and one shilling for Natives.

Further evidence of the difference in benefits obtained by the racial groups was given by Patterson (1953, pp. 114 and 281). (Table 9).

TABLE 9.

AVERAGE ANNUAL GRANTS ACCORDING TO RACIAL GROUPS, SOUTH AFRICA, 1950.

(Number of recipients shown in brackets)

BENEFIT	EUROPEANS	COLOUREDS	ASIATICS	NATIVES
Old age pension	£62. 5.0. (69,772)	£24.17.0. (36,098)	£23. 0.0. (5,258)	£6. 4.0. (197,170)
War veterans' pension	£106.13.0. (20,432)	£26.13.0. (578)		£7. 0.0. (2,300)
Disability grants	£64. 6.0. (11,966)	£25.14.0. (5,540)	£23.11.0. (1,058)	£6. 9.0. (33,391)
Blind pensions	£61. 5.0. (1,158)	£29. 0.0. (1,587)	£27. 1.0. (138)	£6.17.0. (21,638)

Source: Patterson, (1953, pp. 114 and 281).

Further evidence of the differentiation on a racial basis in the disbursement of social welfare grants has been given by Jones (1949, pp. 413-441) and Wagner and Murray (1951, pp.629-660).

While these figures apply to the Union of South Africa as a whole, they reflect the differences in standard of living and in official attitudes to European and Non-European social security services. These have a direct bearing on the comparative health of the two racial groups in Cape Town.

While a part of social welfare work is undertaken by various branches of the government, a considerable part is carried out by voluntary agencies, often subsidized by government funds. The type and extent of these governmental and non-governmental welfare and health services are indications of public policy and public feeling in the community.

The non-governmental social welfare organizations in Cape Town in 1939 were listed by the Social Survey Conference (Batson, 1942a), revealing a considerably higher number of organizations available to Europeans than to Non-Europeans. (Table 10).

TABLE 10

CAPE TOWN NON-GOVERNMENTAL SOCIAL WELFARE ORGANIZATIONS, 1939

Major function of organization	Number of organizations available	
	To Europeans	To Non-Europeans
Social diagnosis and advice	5	3
Outdoor relief	13	7
Advice and relief	7	7
Indoor provision for the destitute	16	5
Cheap lodging	7	3
Care of the physically and mentally handicapped	9	7
Institutional provision for correction and reform	10	6
Other	11	10
Combinations of the above functions	5	4
ALL	83	52

Source: Batson (1942a.)

The position with regard to social security and the Coloured people is aptly summed up by Batson (1946) in the following words: "Unendowed with the economic advantages enjoyed by the law-making and land-owning European, lacking even the slender resources of a trading tradition or a tribal economy, the proletarian Cape Coloured lives penuriously and precariously. When, as happens half the time, he sinks into certifiable poverty, the social apparatus nominally available for his assistance proves as a rule ineffectual".

VI. EDUCATION.

It can safely be assumed that the educational standards are closely related to the health standards of a community in modern industrialized society. A low average level of education is associated with

low standards of hygiene and of living generally. Uneducated people are usually unable to achieve high grades of productivity and are incapable of purchasing the commodities considered essential for healthy living. Moreover, their low level of education usually prevents them from using whatever resources they have to the best advantage.

The average standards of education of Non-Europeans, especially Natives, are far below those of the Europeans in South Africa. This renders Non-Europeans unfit for the majority of skilled and better paid jobs.

Comparatively few Non-European scholars proceed beyond Primary education. In 1946 only 2.4 per cent of Native, 3.2 per cent of Asiatic, and 2.2 per cent of Coloured pupils were receiving education above Standard VI, as compared with 17.5 per cent of European pupils (U.G. 53/1948, par. 85).

The comparative educability of various races is a subject of much controversy, and several investigations into the problem have been carried out in South Africa.

The average intelligence quotients of 2,422 Coloured school children at a number of schools were found to range from 71.9 to 93.4 with an average of the whole group of 84.6 (U.G. 54/1937, par. 891). The Commission reporting these findings, however, stressed the necessity "to bear in mind that the Intelligence Tests used almost exclusively in these investigations are not pure tests of innate intelligence. Test results are undoubtedly affected by environmental influences". (Par 895). A battery of ten scholastic performance tests were also applied to groups of Coloured and European children in Standard III. In nine out of ten tests the European children were superior. In one case only, the Coloured gained more marks than the European children.

The Commission concluded that the differences were unlikely to be due to differences in innate intelligence, in interest on the part of scholars, or in opportunities for doing home work. They considered that "the standard of teaching in the Coloured schools might not be what it ought to be", (Par. 926), and suggested that this was the most likely reason for the inferior performance of the Coloured children.

On the question of ethnic differences in intelligence, the

Social and Economic Planning Council expressed itself as follows: "As regards the educability of the Non-European, the experience of South Africa has been similar to that of the United States. In both countries scientific opinion at first supported the common belief in the higher innate intelligence and capacity for education of the European, but recent research has induced a much more cautious attitude". (U.G. 53/1948, par. 55). Later in the Report the Council stressed Fick's finding that nearly 40 per cent of Native children do better than the average European child of the same age.

The fact remained that, even assuming equality of innate ability, the Non-European pupil-material with which the school had to deal was on an AVERAGE inferior to that of the European. "This can be accounted for by inferior nutrition, health, home conditions and cultural environment - all remediable factors. Add to that the fact that Non-European schools are overcrowded, poorly equipped, under-staffed. Their teachers are not as well qualified as European teachers. It is small wonder, therefore, that the Non-European pupil takes longer to reach a certain school standard than the European pupil". (Par. 87).

It is not surprising that the standard of teaching in Coloured schools was lower than that in European schools. In 1936 the cost per European educand was over four times as high as that for Coloured and Asiatic educands. (Table 11).

T A B L E 11.

GROWTH OF STATE-AIDED EDUCATION IN SOUTH AFRICA (1936-1946)

	Percent of population 7-16 receiving education	Annual state expenditure on education	
		Total (£ millions)	Cost per educand
EUROPEANS			
1936	97	9.23	£23.56
1946	95	18.67	£41.03
NATIVES			
1936	22	0.74	£ 2.05
1946	34	2.67	£ 4.12
INDIAN & COLOURED			
1936	67	0.75	£ 5.33
1946	75	2.54	£11.24

Source: U.G. 53/1948. Table XIV (modified).

It can be seen that although the expenditure on education by the State for Non-Europeans increased considerably in the period from 1936 to 1946, European children had great advantages as regards both total expenditure and expenditure per pupil.

One of the ways in which economies were effected was through the low proportion of teachers to scholars in Non-European schools. In 1947 there was an average of 21.1 European, 53.6 Coloured and 42.5 Native pupils per teacher. (Patterson, 1953, p. 100).

Compulsory education in the Cape applies to European children 7 to 16 years of age, or until they pass Standard VI. Coloured education in the Cape may be made compulsory up to age 14 or Standard IV, in any district where facilities are available. In 1953 only three districts had compulsory Coloured education, but Cape Town was not one of these areas. There is no compulsory education for Natives. In the Cape the same provisions exist for Indian (or Asiatic) children as for Coloured.

Education up to Standard VI is free for all races in the Cape. Provision is made for the Administration to pay for books and school requisites for indigent pupils up to certain limits at each school.

In 1947 there were in the Cape Province only nine Coloured high schools and eight secondary schools, as opposed to 174 high schools and 66 secondary schools for Europeans. (Patterson, p. 97)

In 1946-47 10,526 Europeans, 1,129 Coloured and 1,389 Natives took the Junior Certificate examination. (Patterson, 1953, p. 98).

Nevertheless, the education position in the Union for Non-Europeans generally has been improving in that a larger proportion of children of school going age attend school (see Table 11). In the Cape Province there has been an increased enrolment of scholars especially among Non-Europeans (despite a virtual lack of compulsion) as shown by the following figures:-

	1937	1949
Europeans	155,988	163,972
Coloured	107,932	174,541
Native	191,913	266,502

(Patterson, 1953. Appendix T, p. 376)

In vocational education there were similar disparities in the facilities available and numbers of scholars attending courses. In 1950 at the Cape Town Technical College there were 11,524 European and 827 Coloured students; of these 2,765 and 412 respectively were apprentices. (Patterson, 1953, p. 101).

At the University level Non-European students are also somewhat restricted, apart from the economic difficulties in paying for higher education. Even at the University of Cape Town, which is a "mixed" University, Non-European students are not accepted for all faculties, e.g. Engineering and Fine Art, and medical students are restricted in their clinical work to attendance only at clinics, operations, and post-mortem examinations upon Non-European patients.

VII. HEALTH SERVICES

In primitive rural society there is little division of labour, but in industrial cities we depend heavily upon organized community services. Amongst these the public health service plays an important part both in overcoming the disadvantages of living in crowded communities and in the successful application of modern medical knowledge. If these services are adequate, and are properly utilized, much preventable disease and death can be avoided.

In Cape Town the Non-European population, being in general worse off economically and educationally, are more dependent upon health services organized by public bodies than are the European population.

1. NON-PERSONAL HEALTH SERVICES.

The provision and supervision of non-personal health services within the municipal area of Cape Town are the responsibility of the local authority. These duties have been imposed upon it by the Public Health Act of 1919, the Housing Act of 1920, and the Slums Act of 1934, as amended.

Although in theory all sections of the community have equal opportunities of benefiting from municipal services, in practice the low income groups are at a disadvantage. The poorer classes are, for example, generally the last to be provided with a new water borne sewage system, and are subjected to nuisances or poor housing conditions because of the limitation of choice of residence imposed by their poverty.

It has already been seen that there are a far greater number of Non-Europeans who are poverty stricken than Europeans, and that housing conditions of Non-Europeans are inferior. These differences are expressed in the contrasting vital statistics for the two main racial groups, as is shown later in this study.

2. PERSONAL HEALTH SERVICES.

Preventive health services which are free to the public are provided in Cape Town by a number of agencies. These agencies may be directly employed by the central Union Health Department, or they may be under the control of the Cape Provincial Administration or of the Cape Town City Health Department, and subsidized from Union Government funds. In addition there are charitable organizations who also give such services, and who are subsidized from public funds either directly, by means of donations and subscriptions, or indirectly by grants from Government departments. Thus many of these services, though provided by one agency, are paid for by some other body.

(a) Personal preventive services. The free personal preventive services available in Cape Town and the agencies who provide them are tabulated in Table 12.

TABLE 12

FREE PERSONAL PREVENTIVE HEALTH SERVICES AVAILABLE TO THE PUBLIC IN CAPE TOWN

SERVICE	AGENCY			
	Central govt.	Provincial govt.	Local govt.	Voluntary bodies
IMMUNIZATION:				
Small pox	E.C.N.			
Diphtheria/whooping cough			E.C.N.	
INFECTIOUS DISEASES:				
Isolation	E.C.N.		E.C.N.	
MATERNAL & CHILD WELFARE:				
Pre-natal clinics		E.C.N.	E.C.N.	C.N.
CONFINEMENT:				
Hospital		E.C.N.		E.C.N.
Domiciliary		E.C.N.		E.C.N.
Postnatal clinic			E.C.N.	E.C.N.
Family spacing			E.C.N.	E.C.N.
Infant welfare clinic			E.C.N.	E.
Day nurseries/nursery schools			C.N.	E.C.N.
Meals for mothers and pre-school children			E.C.N.	
SCHOOL SERVICES:				
Meals		E.C.		
Medical examination		E.C.		
Clinic			E.C.N.	
HEALTH VISITING			E.C.N.	

E = Europeans, C = Coloured and Asiatics, N = Natives.

For those who can afford it many of these services are provided by private family doctors or specialists who are presumably employed far more frequently by the European section of the population.

The extent to which the preventive services provided by the City Health Department were used in two typical years by Europeans and Non-Europeans is shown in Table 13. The live births occurring in these years are given as well to provide a basis for comparison.

TABLE 13

UTILIZATION OF MUNICIPAL PERSONAL PREVENTIVE SERVICES.
CAPE TOWN, 1937-38 and 1952-53

	1937-38			1952-53		
	EUR.	NON-E.	TOTAL	EUR.	NON-E.	TOTAL
Number of live births	2,925	7,016	9,941	3,522	10,700	14,222
ATTENDANCES AT:						
Pre-natal clinics	1,959	10,535	12,494	959	25,584	26,543
Welfare clinics	27,845	72,637	100,482	21,341	137,399	158,740
School clinics	4,202	7,304	11,506	1,505	13,212	14,717
FREE DINNERS FOR:						
Mothers (pregnant and lactating)	1,442	21,503	22,945	18	25,497	25,515
Children (pre-school)	3,160	61,564	64,724	92	79,505	79,597
IMMUNIZATIONS COMPLETED						
Diphtheria	3,463	3,304	6,767	-	-	-
Diphtheria and whooping cough	-	-	-	3,750	13,010	16,760

Source: M.O.H., Cape Town. 1937-38 and 1952-53

It can be seen that Europeans used the free municipal personal preventive services to a considerably lesser extent in 1952-53 than in 1937-38 despite a 20 per cent increase in births during that period; (the only exception was the number of diphtheria immunizations, which increased slightly). This may be due to increased utilization of private medical services as a result of greater prosperity in the war and post-war years. On the other hand, the Non-Europeans, among whom live births increased by about 50 per cent, generally made far greater use of the free municipal clinic services in 1952-53 than in 1937-38. However, although the number of dinners served to expectant and nursing

mothers and to pre-school children rose in absolute figures, this particular rise was not proportional with the increase in the number of births over the same period.

(b) Curative services. The provision of free curative medical services in Cape Town is also the responsibility of a number of agencies. These agencies again are financed by the public, either directly by donations and subscriptions, or indirectly from taxation. The services are subsidized by grants eventually derived from central Union Government funds.

The free curative services available in Cape Town and the agencies who provide them are tabulated in Table 14.

TABLE 14

FREE CURATIVE MEDICAL SERVICES AVAILABLE TO THE PUBLIC IN CAPE TOWN

SERVICE	AGENCY			
	Central govt.	Provincial govt.	Local govt.	Voluntary bodies
OUT-PATIENT				
General		E.C.N.	N.	C.N.
Infectious diseases			E.C.N.	
Venereal diseases			E.C.N.	
Mental diseases	E.C.N.	E.C.N.		
Dental clinics		E.C.N.	E.C.N.	
IN-PATIENT				
General		E.C.N.		
Infectious diseases			E.C.N.	
Venereal diseases			E.C.N.	
Mental diseases	E.C.N.	E.C.N.		
DOMICILIARY CARE				
District nursing				
"Poor Doctor"			E.C.N.	

E = Europeans, C = Coloured and Asiatics, N = Natives.

Cape Town, being an administrative centre, possesses hospitals with regional aswell as local functions. It is impossible to ascertain what proportions of the public medical services are used by citizens of Cape Town and by other members of the public respectively.

According to the standards quoted by the Cape Hospitals Commission (Union of South Africa, 1946-47), the number of hospital beds required for acute cases in urban areas was 4.5 per 1,000 of population. This commission estimated that the deficit of beds in 1946 for acute

mothers and to pre-school children rose in absolute figures, this particular rise was not proportional with the increase in the number of births over the same period.

(b) Curative services. The provision of free curative medical services in Cape Town is also the responsibility of a number of agencies. These agencies again are financed by the public, either directly by donations and subscriptions, or indirectly from taxation. The services are subsidized by grants eventually derived from central Union Government funds.

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Infectious diseases			E.C.N.	
Venereal diseases			E.C.N.	
Mental diseases	E.C.N.	E.C.N.		
Dental clinics		E.C.N.	E.C.N.	
IN-PATIENT				
General		E.C.N.		
Infectious diseases			E.C.N.	
Venereal diseases			E.C.N.	
Mental diseases	E.C.N.	E.C.N.		
DOMICILIARY CARE				
District nursing				
"Poor Doctor"			E.C.N.	

E = Europeans, C = Coloured and Asiatics, N = Natives.

Cape Town, being an administrative centre, possesses hospitals with regional aswell as local functions. It is impossible to ascertain what proportions of the public medical services are used by citizens of Cape Town and by other members of the public respectively.

According to the standards quoted by the Cape Hospitals Commission (Union of South Africa, 1946-47), the number of hospital beds required for acute cases in urban areas was 4.5 per 1,000 of population. This commission estimated that the deficit of beds in 1946 for acute

general cases in the whole of the Cape Province was 1,973 for Europeans and 5,975 for Non-Europeans.

The number of "acute general" beds, i.e. excluding those for maternity, infectious, mental and convalescent cases, in Provincial hospitals in the Cape Peninsula in 1951 was 634 for Europeans and 731 for Non-Europeans. (Cape Province Provincial Administration, Report of Director of Hospital Services, 1951). In addition the Municipality of Cape Town provided a 30-bed hospital for Natives in Langa (M.O.H., Cape Town, 1951-52, p. 57).

It should be noted that these public hospitals served the population of Greater Cape Town and also received a number of patients from other areas of the Province where special diagnostic and therapeutic facilities were not available.

On the standards previously suggested the numbers of hospital beds for acute cases for the population of the City of Cape Town in 1951 should be as follows:

TABLE 15

HOSPITAL BEDS AVAILABLE AND REQUIRED IN CAPE TOWN, 1951
(ACUTE GENERAL CASES ONLY)

	Population (1,000s)	Beds available	Beds required	Deficit
EUROPEANS	186.7	634	840	206
NON-EUROPEANS	254.6	761	1,145	384

The real deficit of beds for Cape Town is considerably greater than the figures indicate because many of the available beds are occupied by patients normally resident in other parts of the Cape Province. Whereas the deficit is largely, or even entirely, made up for Europeans by beds available in private hospitals or nursing homes, this is certainly not the case for Non-Europeans.

An indication of the increasing utilization of general hospital beds in Cape Town is given by the figures for admissions to hospitals in the Cape Peninsula. (Table 16).

TABLE 16

ADMISSIONS TO PUBLIC GENERAL AND MATERNITY HOSPITALS IN THE CAPE PENINSULA

Year	Europeans	Non-Europeans
1934	6,183	5,457
1942	11,254	9,769
1948	12,951	18,168
1951	14,564	19,919

Source: 1. Cape Hospital Board, Annual reports for 1934, 1942, and 1948.

2. Cape Province, Director of Hospital Services, 1951.

The Director of Hospital Services of the Cape Provincial Administration (1951) reported that the numbers of beds available in provincial hospitals in Cape Town in 1951 were 678 for Europeans and 757 for Non-Europeans. When it is remembered that the Non-Europeans in 1951 outnumbered the Europeans by nearly 70,000, that the great majority of Non-Europeans cannot afford private hospitalization, that home conditions of Non-Europeans in Cape Town are in general far worse than those of Europeans, and that a greater proportion of Non-Europeans cannot pay for private medical care, then it is patent that Non-Europeans in Cape Town are not able to enjoy the benefits of medical care to anything like the same extent that Europeans can. The notorious difficulty of obtaining admission to a provincial hospital in the case of Non-European patients, particularly if they are children, as compared with the relative ease of obtaining a bed for a European patient is further evidence of this inequality.

The proportions of Europeans and Non-Europeans who died in institutions also illustrates this difference. (Table 17).

TABLE 17

PROPORTIONS OF ALL DEATHS WHICH OCCURRED IN INSTITUTIONS CAPE TOWN, 1914-15 TO 1952-53

PERIOD	EUROPEANS		NON-EUROPEANS	
	Total deaths	Per cent deaths in institutions	Total deaths	Per cent deaths in institutions
1914-15 to 1918-19	7,116	23.1	14,980	9.3
1919-20 to 1923-24	6,287	25.3	12,348	11.4
1924-25 to 1928-29	6,140	34.1	13,802	16.2
1929-30 to 1933-34	7,083	35.8	15,116	19.0
1934-35 to 1938-39	7,943	40.5	16,139	22.0
1939-40 to 1943-44	8,684	39.2	17,969	23.6
1944-45 to 1948-49	9,098	39.3	18,619	24.0
1949-50 to 1952-53	7,192	41.5	14,537	26.0

Source: M.O.H., Cape Town. 1914-15 to 1952-53.

Apart from public hospitals, the institutions in which people died included private nursing homes, homes for the aged, mental hospitals, orphanages and gaols. However, the numbers of deaths which occurred in institutions not intended for the treatment of illness, were small and these percentages are a fairly sound index of the comparative availability of institutional medical care for Europeans and Non- Europeans respectively. It is probable that in earlier years a considerable proportion of Non-Europeans died outside of institutions because they refused admission. That this fear of hospitalization has now greatly diminished is borne out by the difficulty in obtaining hospital accommodation for Non-European patients seeking admission.

From Table 17 it can be seen that the proportion of deaths which occurred in institutions has been slowly increasing for both racial groups. Although the Non-European percentage has increased more rapidly it is still a long way behind the European level.

In a later section of this study it will be shown that in the quinquennium 1947-48 to 1952-53, 72.4 per cent of European and 36.7 per cent of Non-European live births in Cape Town occurred in institutions.

It is evident that for a larger proportion of Non-Europeans than of Europeans both death and birth are unassociated with the benefits of medical care in institutions.

3. CULTURAL DIFFERENCE AND MEDICAL CARE.

European doctors and nurses frequently encounter unexpected difficulties when dealing with members of a culture or sub-culture other than the one from which they themselves come. This is most apparent in South Africa when patients are Natives or Asiatics whose cultures are furthest away from the Western way of life. But even with Coloured patients health workers often have to face clinical problems for which their academic training has not prepared them.

Doctors and nurses often remark on the "unreliability", "superstition", "stupidity" or "obstinacy" of their Non-European patients, and cannot understand why the latter frequently delay in seeking medical care, or use "home remedies", or fail to take the advice given them. The patient, on the other hand, reacts by feeling that the doctor (or nurse) is harsh or unsympathetic, and does not understand his illness

or personal problems - all of which may have a basis of truth. He consequently uses the remedies he learnt from his parents, or goes from one medical agency to another in search of acceptable therapy and advice. This difficulty in the relationship between health worker and patient is extremely common in Cape Town, and in the long run is probably responsible for a considerable amount of avoidable morbidity and death. Palley and Bruwer (1946), for instance, found that 67 per cent of Native patients attending the paediatric out-patients department of the Groote Schuur Hospital, Cape Town, did not re-attend when required to do so. They stressed the economic, social and cultural reasons for this.

Increasing attention is being paid in recent years to the cultural reasons for people frequently failing to make use of Western medical services which are freely available and, to the doctors and nurses, obviously desirable. (Saunders, 1954; Levy, 1954).

Keen (1950), Longmore (1954) and Phillips (1954), among others, have discussed Bantu concepts of health and disease and stressed the need for European doctors to understand the ideas of the patients if their advice and treatment are to be offered in acceptable ways.

The author had eight years experience in providing a family health and medical service to several racial groups in Durban in the Institute of Family and Community Health. In this service the cultural background of patients was taken into consideration (Phillips and Cohn, 1954), and in the opinion of the author this approach was largely responsible for the comparatively high standard of health, despite poor socio-economic conditions, in the communities served. For example, in the Native population attended by the personnel of the Lamont Health Centre, which was a unit within the Institute of Family and Community Health, during the years 1949-50 and 1950-51 the infant mortality rates were respectively 65 and 83 per 1,000 live births. (Lamont Health Centre, 1950 and 1951). These rates compare very favourably with those in other Native townships such as Langa in Cape Town, which had infant mortality rates of 307.7 and 312.9 during the same years, even if due allowance is made for the under-registration of births in these communities.

VIII. ALCOHOLISM AND CRIME.

The inferior cultural and economic position of Non-Europeans

in South Africa is frequently attributed by Europeans to drunkenness, irresponsibility, laziness, lack of group loyalty, dirtiness, dishonesty, and criminality. "Statistics often support the latter stereotypes, but the South African white who cites them to support his stereotype rarely mentions the greater willingness of the police to arrest, and of courts to convict, Non-Europeans. He also ignores the causal factors of ignorance, poverty, frustration, insecurity, ill-health and bad housing which usually prevail in groups with a high crime rate". (Patterson, 1953, p. 180).

The same author considers that apathy and fatalism, drinking, dagga-smoking, gambling and violence are submissive, escape or resistance responses to the imposition of a status-hierarchy by a dominant group. (Ibid, p. 181).

One of the factors which undoubtedly helps to perpetuate or initiate alcoholic habits is the "Tot System" whereby employers of Coloured labourers are allowed to give their workers liberal quantities of unfortified wine during the course of the day. This custom is prevalent in the farming districts of the Cape Province whence many of Cape Town's Coloured population originate. The Cape Coloured Commission (U.G. 54/1937, par. 99) was of the opinion that the "Tot System" was a contributory cause to Coloured poverty and recommended its abolition. Nevertheless, the system persists. The Commission also expressed the opinion that alcoholism among many of the Coloured people was a form of escape from monotony, drudgery and poverty and that poverty was therefore both a cause and an effect of their drinking habits. (Ibid, par.84).

In a brief review of the reasons why people are addicted to the immoderate use of alcohol Gillin (1946, p.92-93) says that former theories held that it was due to the sinful nature of man. This was a pre-scientific rationalization on the basis of certain observed social results of alcoholism. Recent studies, however, have indicated that there are more fundamental bases in the constitution of the individual and in the economic, psychological and social conditions. Gillin also refers to studies which attribute the genesis of the alcoholic to the development of a weak ego which may be due to adverse conditions in childhood. A number of alcoholics are neurotic or mentally defective,

but changes in society have put strains upon the individual to which the previous experience of the race has not adapted him. Personality studies suggest that alcoholism may result from lack of adjustment to social conditions, and from having to meet unaccustomed crises. In addition, social conventions have been found to incite the formation of alcoholic habits.

It is evident that alcoholism and other forms of social maladjustment, are not primary causes of ill-health, but both are activating factors in the vicious circle. This cumulative effect of various adverse living conditions is well described by Myrdal (1944, p. 75) in discussing the social position of Negroes in the United States.

CHAPTER III

DEMOGRAPHY OF CAPE TOWN

DEMOGRAPHY AND HEALTH.

Demographic data provide the bases for any study of public health trends. Most vital statistics are computed from figures obtained from a census of the population at a particular moment of time, and on data derived from registration of events such as births, deaths, the occurrence of certain diseases, etc. When measurements of the health of a community are made it is necessary to correct for differences in age and sex composition so that valid comparisons with other communities can be drawn.

In addition, demography provides us with several indirect measures of the health of communities. Among these are the rate of growth and the age and sex composition of the population and the various reproductive rates, all of which provide more subtle measures of health and virility than do rates reflecting merely morbidity and mortality.

There are numerous inter-connections between demography and health. The growth of modern populations has been associated with improvements in nutrition and the control of mass diseases as a result of technical developments in agriculture, engineering and medicine. The more recent decline in fertility has been largely dependent on the development and use of contraception and the results are of interest to both demographer and health worker.

Cycles of war and peace and prosperity and depression usually affect marriage, birth, death and infant mortality rates. They may also severely disturb normal living by separating men from their wives, or children from their parents, causing changes in the age and sex composition of communities and resulting in various forms of ill health.

The decline in the mortality and fertility rates have resulted in an increasing proportion of old people in modern communities. This "ageing" of the population in various countries has been the cause of much concern to statesmen, economists and health workers. It is rapidly increasing the importance of the chronic and degenerative diseases in the work of the medical practitioner.

It will be seen that in Cape Town the Europeans and the Non-Europeans present marked contrasts both demographically and medically.

POPULATION GROWTH OF CAPE TOWN.

Before analysing the population trends in the City of Cape Town, it is necessary to remember that the population structure of a community at a particular time is the resultant of several dynamic forces. These forces are: 1. Reproductivity. 2. Mortality. 3. Migration.

When considering the population of a city trere is an additional factor which modifies the population picture, viz., the size of the geographical area which legally constitutes the municipality. The boundaries of the City of Cape Town since 1900 were in fact extended in 1913, 1928 and 1943 when substantial additions both in area and in population occurred.

"Greater Cape Town", i.e. the municipality itself together with the surrounding urban areas whose life is closely integrated with it, would probably be the proper unit for study from a sociological point of view. But in the present investigation the "Municipality of Cape Town" has been chosen as the unit for the reasons that it is more easily defined, and because more precise and uniform demographic and health statistics are available.

EARLY GROWTH.

For many years after the establishment of the Colony, Cape Town remained an outpost of civilization.

In 1690 the population of the settlement, then bounded by the Drakenstein Mountains 30 miles inland was reported to consist of the following: 836 Burghers (including their families), 381 Slaves, 489 Company staff.

By 1791 the settlement had expanded further inland and consisted of 3,613 Burghers, 2,460 women, 6,955 children, 495 male servants and 1,051 female servants. (Cape of Good Hope, 1905).

"Compared with the growth of the North American Colonies, or with that later of Australia and New Zealand, the growth of the Cape as a colony of Europe was extremely slow. By the end of the 18th century, 150 years after its establishment, the free burgher population numbered

only 16,000; there were 17,000 slaves and an unknown number of Hottentots, Bushmen and half-breeds - possibly 20,000 in all - giving a total of about 53,000 men, women and children within the borders of the colony. During roughly the same period the population of European settlements in North America had grown to more than six million, and New York, founded (as New Amsterdam) one year after Cape Town, was a thriving city that could have accommodated the total population of the Cape four or five times over." (Marquard, 1954, p. 56).

While large numbers of the Cape burghers moved inland to get away from the Dutch East India Company's - or later the British Government's control, and to seek new pastures, Cape Town grew slowly as the port, the market place, and the administrative headquarters of the colony.

The Municipality of Cape Town was legally proclaimed a local authority in 1838. In 1891 it consisted of what is now Central Cape Town, i.e. it excluded the then independent municipalities of Green and Sea Point, Woodstock, Maitland, Mowbray, Rondebosch, Claremont, Muizenberg and Kalk Bay, and Wynberg and the area of Windermere - all of which constitute the City of Cape Town to-day.

By the last quarter of the 19th century South Africa was beginning to attract immigrants in large numbers. In the 19th century the population of Britain increased from 10.5 million in 1801 to 37 million in 1901. In addition, the depression of the 1870's made millions of Britons emigrate. A number of these emigrants attracted by the discovery of mineral wealth, came to South Africa to seek their fortunes. Although these discoveries drew most of them inland, a fair number remained in Cape Town.

In 1891 the population of the Municipality of Cape Town consisted of:

EUROPEANS			NON-EUROPEANS		
Male	Female	Total	Male	Female	Total
13,703	11,690	25,393	12,547	13,311	25,858

(Cape of Good Hope, 1892)

Among the Europeans the proportion of males to females was 1.21 : 1, which was to be expected in a population which consisted

largely of immigrants. Among the Non-European population the ratio was 0.94 : 1 which was more in keeping with a settled community.

THE POPULATION OF CAPE TOWN AT THE BEGINNING OF THE 20TH CENTURY.

In July, 1902, a "rough census" of Cape Town was taken. As can be seen from Table 18 there was a great preponderance of males in the population which was only partially explained by the presence of several thousand military personnel.

TABLE 18

"ROUGH CENSUS" OF CAPE TOWN - 1902

	CIVIL		MILITARY		TOTAL	
	Eur.	Non-Eur.	Eur.	Non-Eur.	Eur.	Non-Eur.
Male	25,950	19,840	7,689	728	33,639	20,568
Female	13,949	12,571	88	-	14,037	12,571
Total	39,899	32,411	7,777	728	47,676	33,139

Source: M.O.H., Cape Town, 1902-1903.

In 1904 a more accurate and comprehensive census for the whole of the Colony of the Cape of Good Hope was taken. Some of the statistics for Cape Town are shown in Tables 19 and 20.

TABLE 19

POPULATION OF CAPE TOWN - 1904

	Persons	Male	Female
EUROPEANS	44,203	28,785	15,418
NON-EUROPEANS (Total)	33,465	18,832	14,633
(a) Malay	6,561	3,189	3,372
(b) Hottentot	379	245	134
(c) Fingo	801	786	15
(d) Kafir	1,346	1,253	93
(e) Mixed and others	24,378	13,359	11,019
TOTAL POPULATION	77,668	47,617	31,051

Source: M.O.H., Cape Town, 1904-1905.

It can be seen from Table 19 that there were more Europeans than Non-Europeans in the Municipality in 1904. The "mixed" with the

Malay groups constituted 92.5 per cent of the Non-Europeans. Among the Europeans the ratio of male to female was 1.85 : 1 and among the Non-Europeans it was 1.29 : 1. Only among the Malays were there more females than males. For the great majority of Cape Malays the neighbourhood of Cape Town had for many years been the traditional home (Lewis, 1949), and their home life had probably been least affected by migration from overseas or rural areas.

The cultural heterogeneity of the City was further increased by the great diversity of birth places of the European population. (Table 20). Approximately one-third of them were born in South Africa, one-third in Britain and the remainder elsewhere, mainly in other European countries.

TABLE 20

BIRTH PLACES OF THE POPULATION, CAPE TOWN, 1904

Birth place	Europeans		Others	
	No.	%	No.	%
AFRICA				
Cape Colony	15,859	35.9	28,991	86.5
Elsewhere in Africa	1,503	3.4	997	3.0
EUROPE				
Great Britain	14,783	33.4	10	-
Other countries in Europe	10,329	23.4	35	0.1
ASIA				
India	91	0.2	2,846	8.5
Other countries	152	10.3	285	0.9
AMERICA	628	1.4	298	0.9
AUSTRALIA	837	1.9	3	-
AT SEA AND UNSPECIFIED	21	-	-	-
Total	44,203	99.9	33,465	99.9

When one considers too the ethnic mixture which constituted the Non-European population of Cape Town, one realizes how well the City deserved the nickname "Tavern of the Seas".

POPULATION GROWTH IN THE 20TH CENTURY.

Urbanization.

The growth of the population of Cape Town from the beginning of the century must be viewed against the South African background because the city grew not only by natural increase and my immigration from overseas but also as a result of the drift from rural to urban areas. This

urbanization was the outcome of the industrial expansion of the country initially as a result of the development of the mines, but greatly stimulated by the two world wars. The extent of this urbanization in South Africa is shown by Table 21.

TABLE 21

PERCENTAGE OF POPULATION OF SOUTH AFRICA IN URBAN AREAS AT VARIOUS TIMES

CENSUS YEAR	EUROPEANS %	COLOUREDS %	ASIATICS %	NATIVES %	ALL RACES %
1904	52.91	-	-	-	23.18
1911	51.70	-	-	-	24.74
1921	55.78	45.82	39.90	12.50	25.05
1936	65.24	53.91	66.27	17.31	31.38
1946	72.46	58.15	70.28	22.99	37.34
1951	74.63	60.81	75.71	23.56	38.99

Source: Horrell, 1953, Table 15.

Further evidence of this townward drift is given by Table 22.

TABLE 22 a.

URBAN AND RURAL POPULATIONS OF CAPE PROVINCE 1936 AND 1946

	URBAN		RURAL	
	1936	1946	1936	1946
Europeans	503,997	617,969	287,577	252,826
Coloureds	356,368	469,264	325,880	360,286
Asiatics	10,198	14,828	310	346
Natives	219,229	333,812	1,826,341	2,004,517
All Non-Europeans	585,795	817,904	2,152,531	2,365,149
All races	1,089,792	1,435,873	2,440,108	2,617,975

Source: U.G. 51/1949. Table 6 (modified).

Table 22 (a) shows that in the Cape Province the urban population in the period 1936 to 1946 grew much more rapidly than the rural; in fact, the rural European population even showed a decrease during these ten years.

It should be noted, however, that these increases do not

necessarily indicate a physical movement of people into towns. Frequently peri-urban rural districts have been incorporated into urban local authorities, such as happened in the case of the area of Windermere when it was added to the municipality of Cape Town in 1943.

Another measure of the process of urbanization as it affected Cape Town is given by Table 22 (b).

TABLE 22 b

COMPARATIVE GROWTH OF CAPE PROVINCE AND THE CITY OF CAPE TOWN, 1891 - 1946 (Population in 1,000's)

YEAR	CAPE PROVINCE			CITY OF CAPE TOWN		
	Eur.	Non-Eur.	Total	Eur.	Non-Eur.	Total
1891	377.0	1150.2	1527.2	25.4	25.9	51.3
1904	579.7	1830.1	2409.8	44.1	33.4	77.5
1911	582.4	1982.6	2565.0	31.4	37.5	68.9
1921	650.6	2132.1	2782.7	101.7	81.3	183.0
1936	791.6	2738.3	3529.9	150.8	144.1	294.9
1946	870.8	3183.0	4053.8	180.8	203.0	383.8
Per cent increase 1891-1946	131	177	165	612	684	648
Average annual gain %	2.38	3.22	3.00	11.13	12.44	11.78

From Table 22 it is apparent that the rate of growth of the population of the City of Cape Town was about four times that of the Province in which it was situated.

Rapid urbanization has important public health implications. This mass movement to the towns is associated with problems of re-adjustment to a new environment and may have serious repercussions, as regards employment and recreation, housing and sanitation, family relationships, child rearing, exposure to infectious diseases and many other aspects of human activity. Adverse effects have been greatest among the Native population who, as a result of migrant labour conditions, have since 1870 been exposed to the same harmful social influences which are usually seen only in war time and which are associated with an

increase in venereal disease, tuberculosis, illegitimacy, juvenile delinquency, etc. One aspect of this, the social pathology of syphilis, has been discussed by Kark (1949).

The growth of the population of Cape Town is shown in Table 23 and illustrated in Chart 2.

TABLE 23

GROWTH OF POPULATION OF CAPE TOWN, 1891 - 1951
(In 1,000's)

	1891	1904	1911	1921	1926	1936	1946	1951
Europeans	25.4	44.1	31.4	101.7	113.0	150.8	180.8	186.7
Coloureds		31.3	36.5	75.0	87.3	127.6	165.6	207.5
Asiatics				2.2	2.5	3.5	6.1	6.8
Natives		2.1	1.0	4.5	11.6	13.0	31.3	40.2
Non-Europeans	25.9	33.4	37.5	81.7	101.4	144.1	203.0	254.5
All races	51.3	77.5	68.9	183.4	214.4	294.9	383.8	441.2

Note: 1. The City increased in area in 1913, 1928 and 1943.

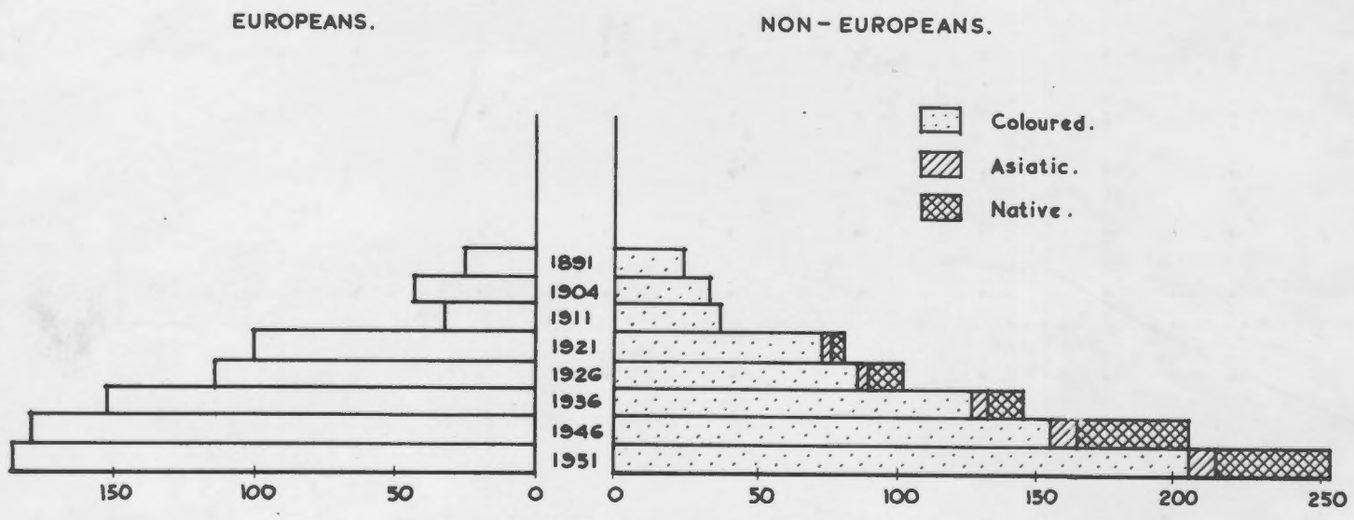
2. Before 1921 Asiatics were included among Coloureds.

The rapid increase in the Non-European population after 1936 is of particular interest. Another feature which is important from the point of view of comparative vital statistics is the decline in the proportion of the Coloured people among the total Non-European group. These proportions were as follows:

1904	93.7 per cent
1911	97.3 " "
1921	92.1 " "
1926	86.1 " "
1936	88.5 " "
1946	81.6 " "
1951	81.5 " "

The relative rates of growth of the various sections of the population of Cape Town from 1921 to 1951 are shown in Table 24.

CHART 2.



POPULATION GROWTH

CITY of CAPE TOWN 1891 - 1951

Increase in City Boundaries 1913 , 1928 , 1943

TABLE 24

RELATIVE GROWTH OF POPULATION BY RACE GROUPS
CAPE TOWN, 1921 to 1951

GROUP	INCREASE 1921-36 (per cent)	INCREASE 1936-1951 (per cent)	POPULATION 1951 CENSUS
Europeans	48.3	23.8	186,660
Coloureds	70.4	62.6	207,544
Asiatics	59.1	94.3	6,790
Natives	202.3	209.2	40,215
Non-Europeans	77.2	76.6	254,549
All Races	61.1	49.6	441,209

This rapid increase in the size of the City's population is an index of its prosperity and virility as a growing community. But at the same time it is an indication of the great demands made upon local and other government for the provision of housing, sanitation, health and welfare services, etc. that are essential for healthy living in large densely populated communities.

Age and sex distribution of the population.

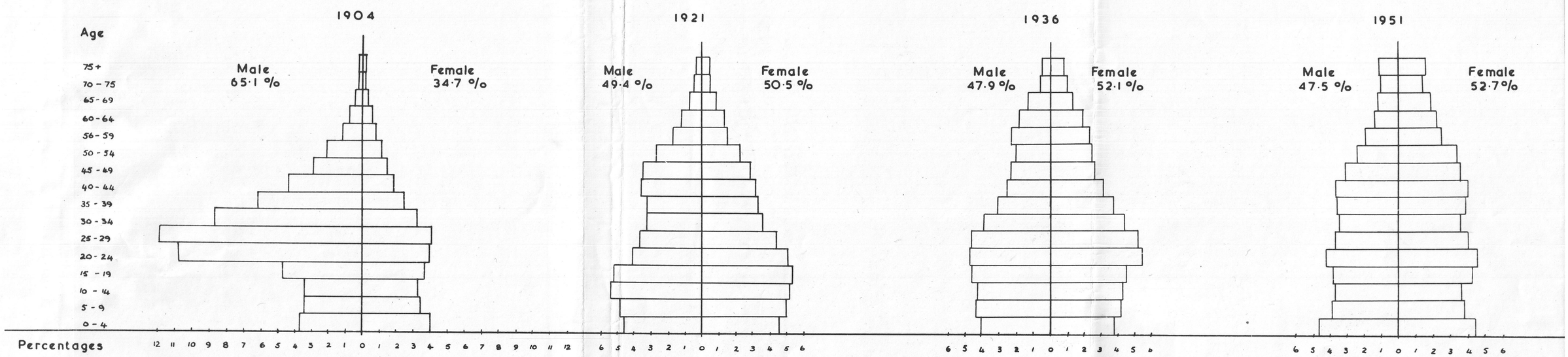
The population pyramids of the European and Coloured sections of Cape Town (Chart 3) provide a marked contrast in age and sex structure. The actual figures upon which these pyramids have been constructed are given in Appendix A.

The shape of the population pyramid for Europeans in 1904 is that of a community which is demographically very lop sided. The predominance of males in the 15 - 49 age group has already been remarked upon as probably being due largely to the aftermath of the South African war. The females were relatively deficient in numbers and consequently the proportions of young children in the population were less than one finds in a stable, growing community.

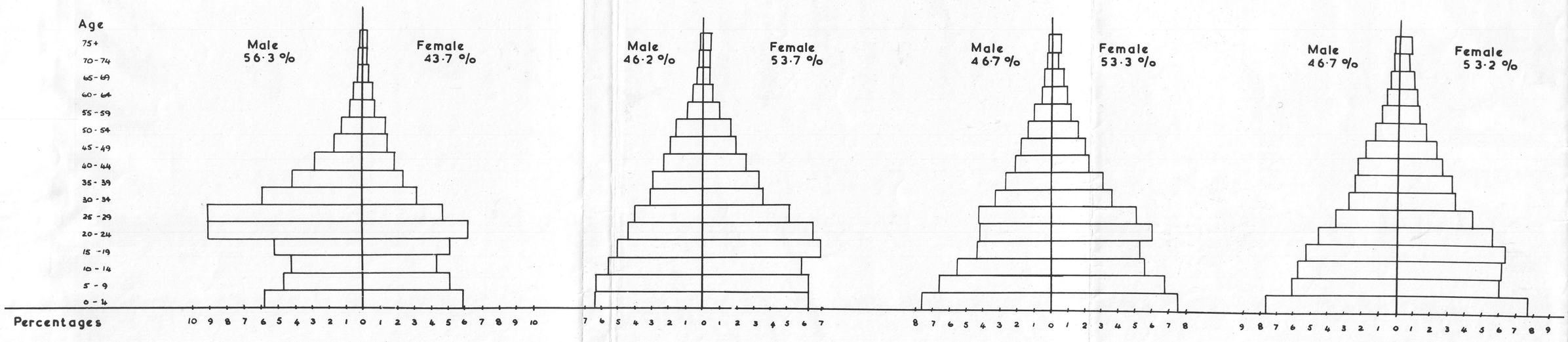
With each successive census, however, the European pyramids tend more and more to lose their irregular shapes and develop the broader bases indicative of the presence of children. Even in 1946, however, there are "bulges" in the pyramids at the 20 - 44 age group levels, probably due to the flow of young adult immigrants either from abroad or from rural areas.

CHART 3.

— EUROPEAN —



— COLOURED —



POPULATION PYRAMIDS — CAPE TOWN 1904 to 1951

It is interesting, too, to note the broadening of the apices of these pyramids indicating the increasing number of older people, especially among the females, in the population.

On the whole the relatively parallel sides of the European pyramids are an indication of the comparative absence of premature death. Only in age groups older than 45-49 do the sides of the 1951 pyramid tend to converge, whereas the narrowing tended to begin at an earlier age in previous censuses.

The Non-European population pyramids are very different in shape. They tend to have broad bases with fairly rapidly converging sides. These are features associated with high fertility combined with high mortality and both of these will be demonstrated in the birth and mortality statistics to be discussed later.

It should be noted that the 1904 and 1911 pyramids are for all Non-Europeans; later ones are for the Coloured population only. In 1904 the Natives constituted 7.5 per cent and in 1911 only 2.6 per cent of the Non-Europeans. Unfortunately the age distributions of the Natives living in Cape Town at the time are not available, so that corrections cannot be made. The Non-European pyramid in 1904, though also showing evidence of maldistribution in the various age and sex groups, is much more in keeping with a normal family life. Much of the disproportion in numbers of males and females was due to the presence of "Hottentot", "Fingo" and "Kafir" groups who together numbered 2,284 males and 242 females.

On the whole the Coloured pattern has changed far less than has the European. There has been only a slight broadening of the apices and little difference in the breadth of the bases or in the slope of the sides of the pyramids.

The predominance of young adult females among the Coloured as revealed by the "bulge" at the 15-19 and 20-24 age group levels appears in nearly all the pyramids. This is probably due to the presence of young Coloured girls and women coming from rural areas and finding work in the city. This preponderance of young adult females probably is a factor which is partially responsible for the persistently high Non-European illegitimacy rate with its consequent infant neglect and high

infant mortality.

It is interesting to compare the population structures of the Europeans and Coloureds in 1951 with those of the populations of Great Britain in 1891 and 1947 (Great Britain, 1949, p. 12). The Coloured 1951 pyramid is almost identical in shape with that of the British in 1891, while the European 1951 and British 1947 ones are very similar. In this instance, as in several others, the Coloured population show characteristics in the middle of the 20th century which the Europeans exhibited half a century earlier.

Sex ratios.

The sex ratios in the reproductive period (15 - 44) for the racial groups at various censuses are shown in Table 25. It is apparent that on the whole the ratio tended to approach unity in the later censuses, indicating the trend towards a more stable family life.

TABLE 25

SEX RATIOS IN CAPE TOWN ACCORDING TO RACE IN AGE GROUP 15-44 YEARS. (Male/female)

	1904	1911	1921	1926	1936	1946	1951
Europeans	2.4	1.3	0.9	0.9	0.9	0.9	0.9
Non-Europeans	1.6	0.9	1.0[x]	1.1	1.0	1.0	+
Coloureds	+	+	0.8	0.8	0.8	0.8	0.8
Asiatics	+	+	6.0	5.0	2.0	1.6	1.5
Natives	+	+	7.0[x]	6.0	2.8	2.7	+

x = Natives were grouped 15 - 49
\+ = Not available.

The very high sex ratio in certain groups has already been referred to and must be regarded as one of the many aspects of social pathology in Cape Town and other urban areas in South Africa.

Age distribution of the population.

The proportions of European and Coloured people under 20, and over 60 years of age are shown in Table 26. Although these figures are affected by migration to some extent, they are also largely affected by the presence of women of child bearing age in the population, the fertility of these women, and the mortality of the community at different ages. The combined proportions of these two age groups is also an index of the

number of dependents in the community.

As was noted previously, the population of Cape Town at the time of the 1904 census had a most irregular sex and age distribution, partly as a result of the South African war which ended two years previously.

TABLE 26

AGE DISTRIBUTION OF EUROPEAN AND COLOURED POPULATION OF CAPE TOWN 1904 - 1951. (Percentages)

AGE GROUP (years)	1904	1911	1921	1926	1936	1946	1951
EUROPEANS							
Under 20	29.7	38.1	40.0	37.5	34.2	32.3	32.4
60 +	3.2	5.2	6.4	7.6	9.8	11.5	12.0
Combined	32.9	43.3	46.4	45.1	44.0	43.8	44.4
COLOUREDS	+	+					
Under 20	40.5	47.8	48.9	49.1	49.5	50.8	51.0
60 +	2.9	3.6	3.8	3.7	4.3	4.4	4.6
Combined	43.4	51.4	52.7	52.8	53.8	55.2	55.6

(+) These figures for 1904 and 1911 are based on the total Non-European population of which the great majority were Coloured.

The following trends and differences in age distribution of Europeans and Coloureds from 1904 to 1951 are apparent from the data:

The proportion of persons under 20 rose among the Europeans until 1921, since when it has slowly fallen. Among the Coloured people this proportion continued to rise steadily until it exceeded 50 per cent in 1946 and 1951. If one disregards the 1904 census figures as being exceptional, there was a considerable fall in the proportion of Europeans under 20, and a slighter rise in the proportion of Coloureds under 20.

The proportion of Europeans of 60 years of age and over rose steadily from being approximately one-twentieth of the population in 1911 to nearly one-eighth in 1951. Among the Coloured population this age group hardly increased in relative size in this period.

In general it can be said that in respect of proportions of various age groups in the population the Europeans "aged" considerably in the period from 1911 to 1951, whereas the Coloureds hardly changed at all. The differences between Europeans and Coloureds in age

distribution in 1911 were accentuated by the passage of 40 years.

TABLE 27

AGE DISTRIBUTION OF POPULATIONS OF VARIOUS COUNTRIES
(Percentages)

		Under 20 years	Over 60 years
Cape Town Coloured	1911	47.8	3.6
South African European	1911	46.3	4.1
India +	1931	49.0	4.1
Cape Town Coloured	1946	50.8	4.4
South African Coloured	1911	49.2	4.5
Cape Town European	1911	38.1	5.2
South African Coloured	1946	52.0	5.6
Britain x	1891	45.0	7.0
South African European	1946	39.4	9.4
Netherlands +	1930	40.0	9.4
Australia +	1931	37.6	10.2
Cape Town European	1946	32.3	11.5
England and Wales +	1931	32.4	11.6
Netherlands ø	1952	37.3	11.8
Britain x	1947	28.0	15.0

Source: + = U.G. 28/1938, p. 11.
x = Great Britain, Royal Commission, 1949, p.12.
ø = De Haas (1955).

Other percentages from Censuses of the Union of South Africa, 1911 and 1946.

In this comparison the European population of Cape Town is seen to be considerably older than that of South Africa as a whole. In 1946 the age distribution of Europeans in Cape Town was almost identical with that of England and Wales fifteen years earlier.

The Coloured population of Cape Town both in 1911 and in 1946 had fewer persons at the extremes of age than that of South Africa as a whole. Their age distribution in 1936 (Table 26) was very similar to that in India in 1931.

C H A P T E R IV

INTER-RACIAL COMPARISON OF FERTILITY

REPRODUCTION AND HEALTH.

In general high reproductive rates are associated with high mortality rates and other evidence of low standards of health. There are many biological and social forces which influence the reproductive activity of a community. But high fertility usually accompanies low standards of living, and it is likely that these two factors inter-act with each other to produce a cumulative effect, or "vicious circle".

On the other hand, very low fertility in a community must be regarded as indicative of ill health, in either the people or the environment. The reproductive instinct is so strong that, apart from sterility due to physical disease, failure of a community to maintain its numbers is an indication of severe social or psychological mal-adjustment.

There are several measures of the reproductive activity of populations. The simplest of these is the Crude Birth Rate which is defined as the number of live births per annum per 1,000 population. The accuracy of the figure depends therefore on two factors:-

(a) The reliability of registration of births in the community, and (b) The reliability of the estimate of population.

In the Cape Colony registration of births has been compulsory by law since 1895. It is impossible to discover how many births have been unregistered since then, but it is probable that a larger proportion of births among the poorer sections of the City - especially the Non-Europeans - have not been recorded.

The population figure used in calculating the birth rate is an estimate of the population at the mid-point of the year under review. Its reliability depends largely on the performance of frequent accurate censuses from which an estimate of population can be made. Even with reliable census figures available, the population trends in Cape Town have fluctuated considerably so that it has been difficult to estimate inter-censal populations accurately and frequently earlier vital statistics have had to be re-calculated in the light of the results of a

new census.

Another factor which influences the birth rate is the age and sex constitution of the population. It has already been pointed out, for instance, that there was a predominance of young adult males in Cape Town in 1904, particularly among the Europeans. This tended to depress the birth rate so that comparisons with populations in other places or at other times have to be made with caution unless corrections are used.

The Fertility Rate is a refinement of the crude birth rate, because it eliminates the distortion due to variations in age and sex composition. It is usually defined as the number of live births per annum per 1,000 women aged 15 to 44. When data are available, age specific fertility rates are used.

Further refinements of measurement can be used. The gross Reproduction Rate is a measure of the number of female infants produced by the average woman in the population during her reproductive period. The Net Reproduction Rate is calculated from the gross rate by applying the female mortality rates, since not all female infants live to reach child bearing age. For the calculation of these figures large populations and accurate statistics over long periods are needed.

BIRTH RATES IN CAPE TOWN.

Crude birth rates have been calculated and reported regularly by the Medical Officers of Health of the City of Cape Town. (M.O.H., Cape Town, 1901 to 1954). These rates have been tabulated in Table 28 and are shown graphically in Chart 4; the actual figures are given in Appendix B. Only since 1938 have Non-European births and birth rates been separated for the three ethnic groups which make up the Non-European section of the population.

From the table it can be seen that during the period 1901 to 1954:

The birth rate for Non-Europeans has always been much higher than that for Europeans, the former rates generally being about twice as high as the latter. Among the Non-European groups since 1940 the rates for Asiatics have generally been the highest, those for Natives the lowest, with those for Coloureds intermediate.

CHART 4

CRUDE BIRTH RATES —— CAPE TOWN 1902 — 1953

TABLE 28

CRUDE BIRTH RATES, CAPE TOWN - 1901 TO 1953-54

(Annual averages 1901 to 1940)

PERIOD	EUROPEANS	NON-EUR.	COLOUREDS	ASIATICS	NATIVES
1901-10	23.3	49.9	...	...	...
1911-20	26.5	46.6	...	...	...
1921-30	21.8	49.5	...	...	...
1931-40	18.5	48.4	...	...	...
1940-41	18.2	45.9	46.3	53.4	37.6
1941-42	20.6	42.5	42.5	49.9	40.3
1942-43	22.0	42.2	41.8	54.4	43.6
1943-44	22.8	45.2	45.3	56.6	39.6
1944-45	20.5	44.2	45.0	42.0	38.8
1945-46	19.7	43.8	44.6	41.0	38.4
1946-47	21.9	45.7	47.8	30.5	33.2
1947-48	20.7	42.5	43.5	46.9	33.4
1948-49	20.3	44.3	45.8	41.2	33.4
1949-50	18.7	43.0	43.6	48.8	36.9
1950-51	18.0	41.4	42.3	46.7	33.6
1951-52	18.3	40.9	41.5	53.3	34.1
1952-53	18.4	39.4	39.9	43.2	35.2
1953-54	18.2	37.9	38.1	52.4	33.4

Source: M.O.H., Cape Town 1901 to 1954.

The rates for both Europeans and for Non-Europeans as a whole have tended to decline. In the second decade of the period under review the rate for Europeans rose somewhat; this is probably due to the increase in females in the population at that time. This rate also rose slightly in the years during World War II and immediately thereafter. The rates for Non-Europeans did not in general show similar fluctuations.

It is of interest to note that the rates for 1918-19 (not shown separately in the table) - the year of the influenza epidemic - were 23.8 and 41.2 for Europeans and Non-Europeans respectively. Both figures were considerably below those of the years immediately preceding and following the epidemic. (See Appendix B).

FERTILITY RATES IN CAPE TOWN.

As mentioned above, fertility rates allow for variations in the age and sex composition of the population.

Fertility rates for the various racial groups in Cape Town for the years during which censuses were taken are shown in Table 29. Owing to incompleteness of information it was not possible to calculate the rates for each group in each census year.

TABLE 29

FERTILITY RATES IN CAPE TOWN BY RACIAL GROUPS+

CENSUS YEAR	EUROPEANS			NON-EUROPEANS			
	Births	Females 15-44	Fertility rate	Group	Births	Females 15-44	Fertility rate
1904	1,049	8,500	123.4	Col.	x	x	
				Asiatic	x	x	
				Native	x	x	
				Total	1,672	7,746	215.9
1911	760	7,256	104.7	Col.	x	x	
				Asiatic	x	x	
				Native	x	x	
				Total	1,642	9,779	167.9
1921	2,526	25,952	97.33	Col.	x	21,203	
				Asiatic	x	175	
				Native	x	415	
				Total	3,769	21,793	172.9
1926	2,332	29,158	80.0	Col.	x	24,328	
				Asiatic	x	239	
				Native	x	1,279	
				Total	4,496	25,846	173.9
1936	2,769	40,111	69.0	Col.	x	33,013	
				Asiatic	x	493	
				Native	x	2,385	
				Total	6,782	35,891	189.0
1946	3,494	46,353	75.4	Col.	6,956	43,229	160.9
				Asiatic	240	1,169	205.3
				Native	802	5,998	133.7
				Total	7,998	50,396	158.7
1951	3,346	45,451	73.6	Col.	8,616	53,081	162.4
				Asiatic	314	1,273	246.7
				Native	1,083	x	
				Total	10,013		

\+ The Fertility Rate is defined as the number of live births per annum per 1,000 females aged 15 - 44 of the population. In this computation it was assumed that all live births which were registered occurred to females of this age group.

x Data not available.

Table 29 shows that there was a decline in the fertility rates of European women during the period under review. The rate in 1936 was the lowest of those calculated and it may possibly be connected with the economic depression which was ending at about that time. In the post-war years the rate was comparatively high, which is consistent with the trend in other countries at the same period.

The fertility rates for Non-European women also show a general decline in the period under review, but the rate in 1936 was unaccountably high - being the fourth of a series of rising rates - and it is possible that this pattern represents steadily improving birth registration. If this is the sole reason for the rise from 1911 to 1936, it is difficult to explain the very high rate in 1904.

Before 1946 the fertility rates for the Non-European groups cannot be calculated separately because of lack of data concerning births. It is likely that the Coloured fertility rates closely approximated those of the Non-Europeans as a whole because the great majority of Non-European women in the age group under consideration (15 - 44) were Coloured. The proportions were 97.3 per cent in 1921, 94.1 in 1926, and 92.0 in 1936. Where it was possible to calculate rates for the Non-European groups separately it can be seen that the rates for Asiatics were much higher than those for Coloureds, with the rate for Natives lowest. There is, however, evidence which strongly suggests that registration of Native births is far from complete. This will be discussed in a later chapter.

The table also shows that the fertility rates for Non-Europeans as a whole were considerably higher than those for Europeans. The disparity was greater in more recent years. The decline in the rates in the period between 1904 and 1951 was 40.4 per cent for Europeans, and 24.8 per cent for Coloureds.

COMPARISON WITH OTHER POPULATIONS.

The birth rates for Europeans and Non-Europeans from 1901 to 1951 are compared with those of other populations in Table 30.

This comparison shows that the rate for Europeans in Cape Town was consistently lower than that in South Africa as a whole. Except for the first decade of the century, when there were relatively few

European women in Cape Town, the rate was consistently higher than that for both England and Wales, and for London. During all periods shown the Cape Town European rates were lower than those of the Netherlands.

The Cape Town Non-European rates were the highest of all those shown in the table, and indeed were among the highest of any recorded birth rates. (United Nations, 1953).

TABLE 30

COMPARISON OF BIRTH RATES IN VARIOUS POPULATIONS
(Annual Averages)

PERIOD	CAPE TOWN		S. AFRICA	ENGLAND & WALES	NETHER-LANDS	COUNTY OF LONDON
	EUR.	NON-E.	EUR.			
1901-10	23.3	49.9	-	27.3	30.6	27.6
1911-20	26.5	46.6	29.8	21.7	26.8	22.0
1921-30	21.8	49.5	26.9	19.2	25.0	18.1
1931-40	18.5	48.4	24.6	15.1	21.0	13.7
1941-50	20.5	43.7	26.0	15.8	23.9	16.8
1951	18.0	41.4	25.5	15.4	22.3	15.6

Sources: Cape Town: M.O.H., Cape Town, 1901 to 1951.

South Africa: (a) 1911 to 1920 - Union of South Africa, Official Yearbook, No. 25. (b) 1920 to 1951 - United Nations (1953).

England and Wales and Netherlands: (a) 1901 - 1920, de Jong (1946). (b) 1920 to 1951, United Nations (1953).

County of London: London County Council (1952).

A comparison of fertility rates in Cape Town and in Britain is shown in Table 31.

TABLE 31

COMPARISON OF FERTILITY RATES IN VARIOUS POPULATIONS

Great Britain		Scotland		Cape Town		
					Eur.	Col.
1891	127.7	1900-02	121.9	1904	123.4	215.9
1947	71.7	1945	73.1	1946	75.4	167.1

Sources: Great Britain: Computed from figures given in Great Britain Royal Commission (1949, p. 14) and Great Britain, Ministry of Health (1953).

Scotland: Crew (1948 , p. 44.)

From this table it can be seen that the reproductive activity of Europeans in Cape Town was very similar to that of the population of Britain and of Scotland.

DISCUSSION.

It has been demonstrated that in Cape Town Europeans and Non-Europeans show markedly contrasting patterns of reproductive behaviour. Fertility has decreased in both groups over the past 50 years, but more so among Europeans who have closely followed the trend of other European populations. With the data available one can only speculate on the significance and implications of this difference.

Biological factors.

A basic biological factor in the expression of fertility is the reproductive drive or instinct without which no species or group can survive. Another such factor is the fecundity or innate capacity of the organism to reproduce. In practice it is impossible to measure human fecundity because of various social and biological checks to its expression. It is therefore impossible to compare the fecundity of two or more populations.

A number of pathological conditions lessen fecundity. Most important among these are infections of the reproductive organs occurring as a result of gonorrhoea, puerperal sepsis, mumps, etc. Various endocrine disorders as well as neoplasms also limit fecundity.

Reproductive capacity in animals is clearly affected by nutrition, and both starvation and obesity lower human fertility. (McLester, 1946, pp. 287-288). However, only when under-nutrition is extreme is fertility depressed. It is generally observed that reproductive rates are usually highest in under-privileged populations and social classes. This latter fact is illustrated in Cape Town when Europeans and Non-Europeans are compared.

It appears, therefore, that biological conditions such as disease and malnutrition are relatively unimportant in determining reproductive rates. It should also be stressed that these biological factors are greatly influenced by social conditions.

Social Factors.

During the past century all modern societies have experienced

or are experiencing a general fall in reproductive rates. These changes have been too rapid to be due to biological factors (Landis, 1943, p. 45). The Royal Commission on Population (Great Britain, 1949, p. 34) considered it extremely unlikely that a decline in the reproductive capacity of the population could account for the great fall in fertility in Great Britain since the middle of the 19th century.

Primarily the birth rate of a community is dependent upon the proportion of women in the reproductive period of life. This proportion is largely determined by the survival of female infants. However, the fall in fertility has continued despite the great decline in infant and child mortality in recent years. The proportion of potential mothers may also be affected by migration, as has occurred among both Europeans and Non-Europeans in Cape Town.

The expression of fecundity of women in the reproductive age is to some extent modified by marriage customs prevalent in the community. Early marriage, a tolerant attitude toward illegitimacy, polygamy and a low divorce rate all promote a high degree of fertility.

The development of an industrial society has had far-reaching effects upon family life. In pre-industrial or rural society kinship and group ties are strong. The family is not only a biological, but also a productive unit, in which having many children is an economic advantage. In the rural family children are taken for granted, and mating and reproduction are part of the rural scene (Landis, 1943, pp. 101-102). In industrial society, on the other hand, kinship and group ties are weakened, and people become more competitive, individualistic, ambitious and at the same time insecure. Because of the necessity for long periods of education and training, children in these circumstances remain dependent for much longer and are therefore far less desirable from an economic point of view. In the struggle for security and social promotion members of small families enjoy an advantage over those of larger families.

The decline in family size began first and proceeded fastest among the higher socio-economic groups. (Kiser, 1941; Great Britain, 1949). Only later did the fertility of the working classes diminish.

Another development in modern society is the change in the

status of women. Far greater consideration is being given to the wishes and comfort of the wife now than in Victorian times. The opportunities for employment of women in industry, commerce and the professions, have greatly increased in recent years. This increasing freedom for women in the 1930's was considered by Glass (1938, p. 199) to favour postponement, or even the rejection, of marriage.

There is, however, evidence that in some populations certain of these trends are tending to change. Myrdal (1940, pp. 49-51) for instance, has shown that in Stockholm the upper classes are becoming more fertile than some of the other groups. Kiser (1955) reported that in the United States the wives of professional men in the period 1940-50 had a relatively high percentage increase in fertility, even though this occupation group was still characterized by low fertility rates.

The growth of scientific knowledge concerning man's origin, and the development of effective methods of contraception made it more possible for people to accept and apply the idea of individual control of the size of their families. As was to be expected, the dissemination of knowledge concerning birth control proceeded most rapidly among the upper and better educated socio-economic classes. (Great Britain, Royal Commission, 1949, pp. 40-43).

When the European and Non-European sections of the population of Cape Town are compared in the light of the above summary, it can be concluded that what is known of the social factors is sufficient to account for the inter-racial differences in fertility found.

Among Coloured people, who make up the great majority of the Non-Europeans in Cape Town, there has been no deficiency of women in the reproductive age groups, probably as a result of migration from the country. Among the Natives there has been some shortage of women in these age groups, and this probably accounts to some extent for their relatively low birth rates but not for their low fertility rates. Among the Asiatics the high fertility and birth rates must be attributed largely to their low age at marriage and other cultural characteristics.

It will be shown later that illegitimacy is high among both Coloured and Natives, and their tolerant attitude towards extra-marital conception also makes for high fertility.

For many Non-Europeans a large family is still not undesirable because there is often little hope of obtaining or benefiting from prolonged education. Although a large family exaggerates their poverty, many poor people regard their children as an insurance against economic adversity. Also the majority of Non-Europeans, because they lack the prospects and hope for social and economic betterment, do not have the same drive to limit their families as the Europeans do. Non-European women, on the whole are still unemancipated, and opportunities for work in industry, commerce, and the professions have occurred only very recently.

All these factors account for the ignorance of Non-Europeans about contraception, and their attitudes towards it, and this is probably the most important single reason for their high fertility rates.

CHAPTER V.

COMPARISON OF MORTALITY TRENDS

MORTALITY AS A MEASURE OF HEALTH.

Although mortality rates provide only a negative measure of health, they are probably still the most valuable indices of the health of communities. They are based on the two most elementary demographic statistics, the census, and the number of deaths in a given period in the population, and are therefore most generally available. They are also probably the least unreliable of all the commonly used vital statistics.

The registration of deaths is far simpler than the recording of morbidity statistics, and in advanced communities is relatively complete. However, difficulties sometimes arise because of movements of people prior to their deaths, so that registrations should be corrected for inward and outward transfers. This applies particularly when dealing with small areas.

In Cape Town a number of people who come from other districts for medical care die within the city. Their deaths are excluded when mortality rates are calculated, i.e. the rates are "corrected for outward transfers". When persons normally resident in Cape Town die in other places, however, no correction is made. It is likely that this error has most effect on the mortality rates for Natives, many of whom return to their kinsmen in rural areas when ill. The rates for this group are therefore probably an underestimate.

Deaths occurring within urban areas in South Africa are fully registered because of the difficulties of burial unless a death certificate is provided. This does not necessarily apply in the rural areas.

The accurate enumeration of population is known to be beset with difficulties. It is likely that the errors in Cape Town have been greatest among the Non-Europeans, especially among the Natives who for various reasons may wish to avoid inclusion in the Census. Recording of age and social data at the time of census probably increases in accuracy with improving social conditions.

In multi-racial communities it is possible that the definition

of a particular racial group differs at the time of census taking, and at registration of death. (Collinson, 1936). This error may well be important in a city like Cape Town where not only public and officials, but even the laws are vague on questions of racial definition and there is frequently an advantage in belonging to one group rather than to another.

Another weakness in the utilisation of the death rates of Cape Town as indices of health is that many of the poorest and sickest people are to be found on the outskirts of the city boundaries, living hidden in the bush and sandy wastes of the Cape Flats. Sociologically these people belong to Cape Town although their vital statistics are not included in those of the City. With improvement in housing and social conditions it is possible that an increasing proportion of the City's socially maladjusted people drift towards the peri-urban area. If the boundaries of the municipality were extended for a few miles eastward across the Cape Flats the vital statistics would probably be very different from what they are.

It must be remembered too, that we have been using the municipal area of Cape Town as the basis of our vital statistics because data are available for this area. This geographical unit has, however, increased enormously in size from 1904 to 1951, and may well have changed in other ways which would tend to lessen the validity of comparisons between 1904 and 1951.

For the above reasons mortality statistics, however valuable, must be accepted and interpreted with caution.

Measures of mortality.

There are several methods of expressing the mortality experience of a community. The simplest of these is the Crude Mortality Rate, which is defined as the number of deaths per 1,000 population per annum. This rate has the disadvantage that it does not allow for differences in the age and sex composition of populations.

It is usual, therefore, to refine the crude figures by calculating mortality rates specific for sex and age groups. Since it is necessary to know the age and sex composition of the population for the calculation of age specific mortality rates, the rates in this study

have been limited to the census years.

The Infant Mortality Rate is essentially a form of age specific death rate. It is so important a measure of public health that it is discussed separately in Chapter VI.

A rough measure of mortality in relation to age is provided by calculating the proportions of deaths in various age groups, as has been done in successive reports of the Medical Officer of Health of Cape Town. These proportions, however, do not take into account the numbers of persons in the various age groups of the population, and are therefore of very limited value.

For purposes of comparison and therefore of observing trends in mortality, it is useful to calculate Standardised Mortality Rates. In essence these rates are fictitious figures representing the mortality which would have occurred in various populations if they had had the same age and sex composition as an arbitrary standard population. Such rates have been calculated in this study to compare European and Coloured mortality trends.

Where accurate data for large populations are available, Life Tables are calculated. These express the probability of dying at certain ages and are only referred to in this chapter in order to provide comparative figures.

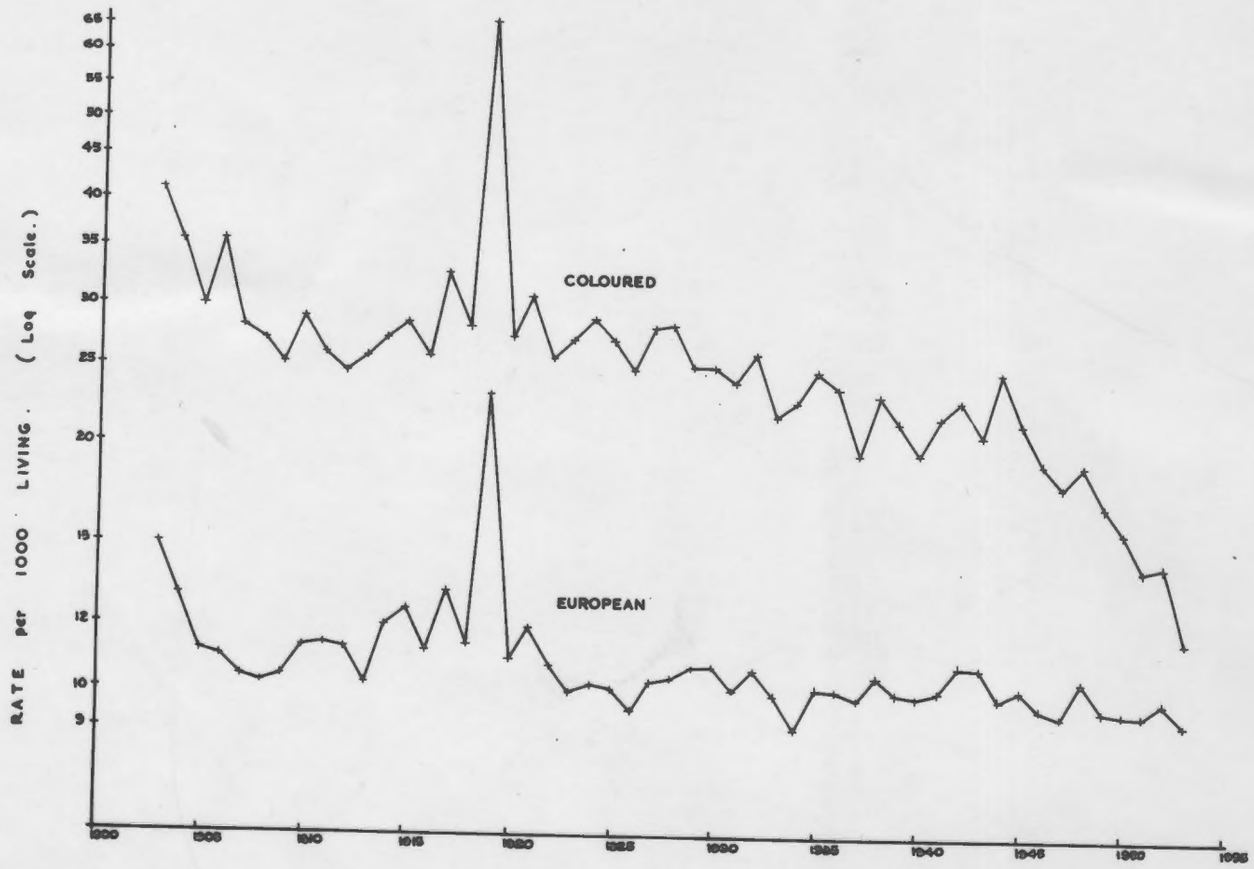
CRUDE MORTALITY RATES.

The crude mortality rates corrected for outward transfers for the City of Cape Town by race since 1901 are shown in Table 32 and Chart 5; the detailed figures are given in Appendix C.

It can be seen from this comparison that during the period 1901 to 1954 crude mortality rates for Europeans were always lower than those for Non-Europeans. There has been a considerable decline in both rates, but this has been much more marked for Non-Europeans. The reductions in the average rates for the period 1901-10 to 1950-54 were 33.1 per cent and 60.1 per cent for Europeans and Non-Europeans respectively. The average rate for Non-Europeans in 1950-54 was approximately the same as that for Europeans in 1911-20.

Separate rates for the various races became available after 1938; since then statistics indicate that among the Non-Europeans

CHART 5.



CRUDE CORRECTED DEATH RATES. CAPE TOWN 1903 - 1953.

mortality was lowest for Asiatics and highest for Natives, with Coloureds intermediate. This, together with the fact that the Coloureds formed over 81 per cent of the total Non-European population, both in 1946 and in 1951, accounts for the close correspondence between the mortality rates for Coloureds and for all Non-Europeans. It is probable that this correspondence applied in the years before 1940 as well.

TABLE 32

CRUDE MORTALITY RATES - CAPE TOWN 1901 TO 1953-54
(Annual Averages 1901 to 1940)

PERIOD	EUROPEAN	NON-EUR.	COLOURED	ASIATIC	NATIVE
1901-10	14.2	34.6	....	....	....
1911-20	13.8	32.0	....	....	....
1921-30	10.5	27.1	....	....	....
1931-40	10.2	22.8	....	....	....
1940-41	10.1	21.8	21.7	18.2	24.6
1941-42	10.8	23.4	23.1	14.6	30.1
1942-43	10.8	21.7	21.0	14.4	34.0
1943-44	9.9	25.5	24.9	16.5	34.2
1944-45	10.2	22.2	21.3	13.2	32.4
1945-46	9.6	20.0	19.2	10.3	29.0
1946-47	9.4	18.8	18.2	8.8	26.8
1947-48	10.5	19.5	19.1	11.1	25.4
1948-49	9.6	17.4	17.0	10.1	22.1
1949-50	9.7	16.4	16.0	8.8	21.3
1950-51	9.5	15.0	14.3	10.6	20.7
1951-52	9.9	15.0	14.4	8.6	21.2
1952-53	9.3	13.1	12.7	8.1	17.0
1953-54	9.4	12.2	11.8	8.5	15.8

Source: M.O.H., Cape Town, 1901 to 1953 - 54.

... = Data not available

The rates for Asiatics have consistently been far below those of the two other Non-European groups. In fact in the fourteen years under review Asiatic mortality rates have declined far more than those of the Europeans, and in the last three years quoted, their rates have been lower than those of the latter group. This has occurred in spite of a birth and a fertility rate two to three times greater than that of the Europeans, and an infant mortality rate which has, on the average, been nearly twice that of the Europeans in the years 1951-1954. On the other hand the Asiatic population has the advantage in age distribution. Whereas 61.6 per cent of the Europeans in 1951 were in the age groups 5-44 years - during which the chances of dying are least - 69.0 per cent

of Asiatics were in those groups. In the groups 45 years and over, the proportions were 28.8 per cent and 13.6 per cent respectively. An advantage which the Asiatics in Cape Town have over other Non-Europeans is that their economic position is considerably better on the average than that of the Coloured and Native sections.

Comparison with other populations.

The Crude Mortality Rates for a number of populations are given in Table 33. Comparison with the rates for Cape Town (Table 32) shows that:

The Cape Town European rates were higher than those for South African Europeans and for New Zealand Whites, but they were lower than those for England and Wales and London County. They were higher than the Netherlands rates from 1911 onwards.

The Cape Town Non-European and Coloured rates have been higher than those for other White populations as well as those of New Zealand Maoris from 1931 onwards.

TABLE 33.

CRUDE MORTALITY RATES IN VARIOUS POPULATIONS
(Annual Averages)

PERIOD	UNION OF SOUTH AFRICA			ENGLAND & WALES	NEW ZEALAND		NETHER-LANDS	LONDON COUNTY
	European	Coloured	Asiatic		Whites	Maoris		
1901-10	x	x	x	15.3	x	x	15.2	15.6
1911-20	11.2	x	x	14.1	x	x	13.4	14.9
1921-30	9.9	x	x	12.2	8.8	x	10.5	12.3
1931-40	9.7	x	x	12.0	8.6	17.4	9.3	12.7
1941-50	9.0	x	x	12.3	9.7	16.0	9.6	13.9
1951	8.8	19.4	9.7	12.5	9.6	11.4	7.5	12.6
1952	8.2	18.5	9.2	11.3	9.3	12.3	7.3	12.0
1953	8.9	18.9	10.1	11.4	x	x	x	11.6

x = data not available

Sources: Union of South Africa: (a) Europeans 1911-20 and rates for 1951-53 Official Yearbook of Union of South Africa, 1952-53, p. 1129-30.
(b) Europeans 1921-1950, United Nations,(1953).

England and Wales, and Netherlands: 1901-20, De Jong (1946).

London County Council: London County Council (1952).
1952 and 1953 rates from M.O.H., Cape Town 1952-3 and 1953-4.

Other data: United Nations (1953).

Since 1951, when mortality rates for Coloureds in the Union of South Africa became available, it has been seen that Coloureds in Cape Town have had lower rates than the country as a whole. A similar comparison in the case of Asiatics shows no definite tendency. No national rates for Natives are available for comparison with those in Cape Town.

Fluctuation of the death rates.

The curves of death rates for the European and the Coloured populations of Cape Town (Chart 5) show some interesting differences.

The European curve shows a moderate but definite decline in death rates from 1901 to 1953. There were fairly steep declines from 1903 to 1908, and from 1913 to 1916, but both of these may have been due, partially or even wholly, to decreases in the population caused by economic depression and the war; these could not be accurately allowed for when calculating the rates. The peak in the year 1918-1919 — not shown separately in the table — was due to the influenza pandemic which doubled the death rate for that year. From 1925 onwards there has been only a very small decline in the rate. The improvement in health, as reflected by the death rate, has, however, been greater than the downward trend suggests if one takes into account the steady ageing of the population.

It cannot be said that social conditions such as the two World Wars or the economic depressions of 1907 and the early 1930's appear to have had any noticeable adverse effect on the crude death rates of the European population.

The Coloured death rates have shown a considerable decline from 1901 to 1953. The most striking improvements occurred in the periods 1901 to1916, and 1944 to 1953. These downward trends are too marked to be accounted for by inaccuracies in estimating population. This applies particularly to the 1944 to 1953 period when censuses in 1946 and 1951 provided an accurate basis for calculating and correcting the rates.

One noticeable feature of the Coloured death rate curve is its far greater variability compared with that of the European. This suggests that the lives of the Coloured population were far more at the mercy of changing epidemiological conditions than were the Europeans.

The tremendous rise in the death rate as a result of the influenza pandemic in 1918-1919 is one illustration of this.

SEX, AGE AND MORTALITY.

1. SEX AND MORTALITY.

A sex difference in mortality rates has been found in most communities. The crude mortality rates for males and females by race in Cape Town are shown in Table 34.

TABLE 34

CRUDE MORTALITY RATES BY SEX AND RACE - CAPE TOWN IN VARIOUS YEARS

YEAR	EUROPEAN		NON-EUROPEAN		COLOURED		NATIVE		ASIATIC	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1904	14.2	12.5	35.1	35.2	x	x	x	x	x	x
1911	12.9	9.7	26.4	25.9	x	x	x	x	x	x
1921	13.2	10.8	31.0	30.3	x	x	x	x	x	x
1926	10.9	8.4	26.9	24.2	x	x	x	x	x	x
1936	12.3	9.2	25.0	22.7	x	x	x	x	x	x
1946	12.5	9.0	21.9	16.8	21.0	15.7	31.0	46.4	15.5	11.8
1951	10.5	8.6	16.7	13.3	16.2	12.8	20.8	20.5	12.2	8.4
1952	11.4	8.4	16.8	13.3	16.5	12.6	19.8	23.4	11.2	5.0
1953	10.6	8.2	14.9	11.4	14.6	11.1	17.2	16.6	10.6	4.5
1954	11.2	7.7	14.1	10.5	13.9	10.0	15.7	16.1	10.3	5.9

x = data not available.

Source: M.O.H., Cape Town, Annual reports.

An interesting finding is that the male rates are always higher than the female; the only exceptions are the rates for Natives, where in some cases the females had higher death rates than the males, and in the 1904 Non-European rates where females had a very slightly higher rate than males. It is also interesting to note that the differences appear to become relatively greater as the death rates fall.

2. PROPORTION OF DEATHS IN VARIOUS AGE GROUPS.

Successive Medical Officers of Health of the City of Cape Town have compiled tables giving the respective proportions of deaths in each age group according to the total deaths among Europeans and Non-Europeans.

These figures are summarized in Table 35.

TABLE 35

PROPORTIONS OF DEATHS IN VARIOUS AGE GROUPS
(Percentages)

(a) EUROPEANS

Age group	1904	1911	1921	1926	1936	1946	1951
Under 1 yr	19.3	15.9	19.6	13.7	7.6	7.3	4.5
1 - 5	6.6	6.4	7.4	4.8	3.7	1.2	1.0
5 - 25	9.6	8.2	9.4	7.4	7.6	3.5	2.3
25 - 65	50.2	50.0	39.9	42.6	41.2	39.2	34.0
Over 65	14.1	19.6	23.7	31.5	39.9	48.7	58.2
Total	99.8	100.1	100.0	100.0	100.0	99.9	100.0

(b) NON-EUROPEANS

						+	x
Under 1 yr	34.7	31.8	33.9	33.3	29.5	23.6	28.8
1 - 5	17.0	17.7	19.3	19.7	17.0	14.5	14.5
5 - 25	10.0	10.8	12.7	11.7	11.7	12.9	9.5
25 - 65	31.6	30.7	26.4	27.6	31.5	37.7	33.0
Over 65	6.5	9.0	7.6	7.6	10.3	11.3	14.1
Total	99.8	100.0	99.9	99.9	100.0	100.0	99.9

(c) NON-EUROPEANS IN 1951

	Coloured	Native	Asiatic
Under 1 yr	27.0	38.6	25.4
1 - 5	14.0	18.2	7.0
5 - 25	9.9	7.3	12.7
25 - 65	33.0	32.9	36.6
Over 65	16.1	3.1	18.3
Total	100.0	100.1	100.0

x = Including Windermere deaths
\+ = Not including Windermere deaths

It can be seen that of all European deaths there has been a diminishing proportion of deaths of young people and a corresponding increase in the proportion of deaths of old people. In 1904 25.9 per cent of European deaths were of children under 5 years of age. By 1951 the proportion had been reduced to 5.5 per cent. In 1904 of all

Europeans who died, only 14.1 per cent were 65 years or older; by 1951 the proportion was 58.2 per cent.

Among the Non-Europeans the trend was not nearly so marked. In 1904, 51.7 per cent of the Non-Europeans who died were under 5 years of age; in 1951 the proportion was 43.3 per cent. In 1904, 6.5 per cent of Non-Europeans who died were 65 years or older; in 1951 the proportion was 14.1 per cent.

The proportions of total deaths in the various age groups among the Coloureds, Natives and Asiatics in 1951 are also shown in the table. It can be seen that the proportions for Natives are much higher in the younger age groups, and much lower in the older age groups, compared with the Coloured and the Asiatic populations.

It is interesting to compare the percentage of total deaths in each age group in the United States in 1934 (Collinson, 1936) with the Cape Town figures of 1936. (Table 36)

TABLE 36

PERCENTAGE OF TOTAL DEATHS IN AGE GROUPS

	CAPE TOWN (European) (1936)	CAPE TOWN (Non-Eur.) (1936)	U.S. WHITE (1934)	U.S. NEGRO (1934)
Under 1 year	7.6	29.5	8.5	12.9
65 and over	41.2	10.3	42.8	17.9

The similarity of the proportions in the Cape Town Europeans and the United States Whites of about the same period is striking. There was a great preponderance of deaths among infants in Cape Town's Coloured population even when compared with the Negroes of the United States.

For reasons already stated these figures provide only a gross measure of the improvement in health.

3. AGE SPECIFIC MORTALITY RATES.

The calculation of death rates for specific age groups of the population overcomes the weighting which results from varying age compositions in different populations. The death rates of infants and old people are higher than the average for the population as a whole, and those of children in the age group 5 to 15 are below average. A change in the proportion of infants, old people or young children may therefore exaggerate or lessen a trend in mortality.

Age specific mortality rates for the various races in Cape Town are shown in Table 37 and Chart 6.

TABLE 37

AGE SPECIFIC DEATH RATES - CAPE TOWN, 1904 to 1951

(a) EUROPEANS

AGE GROUP	CENSUS YEAR							REDUCTION 1904-1951 (per cent)
	1904	1911	1921	1926	1936	1946	1951	
0 - 4	47.0	31.3	39.7	20.3	16.5	10.0	5.8	87.7
5 - 14	3.5	4.2	2.4	1.7	2.1	0.9	0.5	85.7
15 - 24	3.8	2.2	4.0	2.0	2.5	1.2	0.9	76.3
25 - 34	6.1	8.0	5.4	3.1	3.2	3.1	1.4	77.0
35 - 44	14.4	15.3	8.6	5.6	6.1	4.1	3.8	73.6
45 - 54	26.0	15.3	14.3	11.2	11.4	10.2	8.4	67.7
55 - 64	38.3	37.8	26.8	22.9	23.9	20.9	17.4	54.6
65 - 74	93.3	60.6	61.3	52.6	53.9	42.2	44.0	52.8
75 +	145.3	166.1	137.5	188.2	128.6	109.2	109.9	24.4
All ages	14.3	14.3	12.0	9.6	10.7	9.6	9.5	33.6

(b) NON-EUROPEANS

						(i)	(ii)	
0 - 4	162.9	97.9	x	97.5	74.5	48.0	37.1	77.2
5 - 14	7.1	5.2	x	4.7	5.0	3.8	2.0	71.8
15 - 24	10.3	9.0	x	8.6	8.2	6.2	4.2	59.2
25 - 34	17.2	16.2	x	9.2	12.0	10.1	7.0	59.3
35 - 44	28.1	18.7	x	14.0	15.0	15.7	9.0	68.0
45 - 54	33.7	33.3	x	25.2	22.1	25.7	21.1	37.4
55 - 64	59.3	44.9	x	49.3	48.7	45.6	31.5	46.9
65 - 74	87.9	75.7	x	85.1	79.2	70.8	67.8	22.9
75 +	228.4	246.7	x	124.2	119.0	68.6	102.9	54.9
All ages	36.2	28.6	30.6	24.9	23.7	19.2	14.3	61.5

x = age distribution not available
(i) = Coloured only. Does not include deaths of unknown number of Coloured persons living in Windermere. (See text).
(ii) = Coloured only. Includes Windermere deaths.

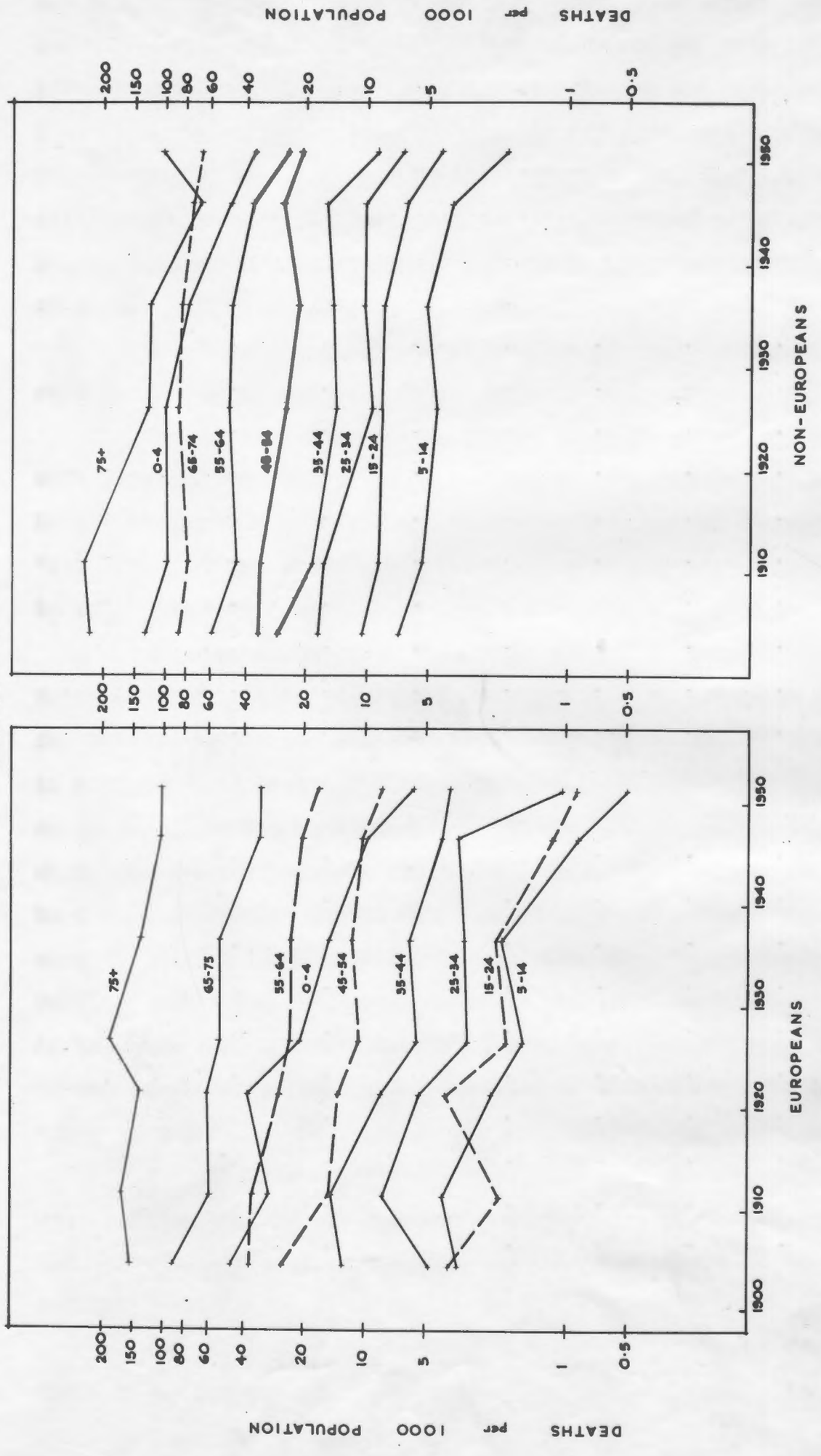


CHART 6.

AGE SPECIFIC DEATH RATE TRENDS
CAPE TOWN 1904 - 1950

The rates have been calculated on the figures obtained from the Reports of the Medical Officer of Health, Cape Town (1904 - 1951) and related to the population recorded at the censuses of 1904, 1911, 1921, 1926, 1936, 1946 and 1951. No correction has been made for the fact that censuses were usually taken in April or May, whereas the deaths occurred in a year which had its mid-point on 31st December - three to five months earlier than when the census was taken. The error thus produced is small because of the slow rate at which the age distribution changes.

In calculating age specific rates for Non-Europeans some difficulties were encountered.

In the 1921 census the ages of Natives in the City of Cape Town were given in the groups "Under 1 ", "1 to 14", "15 to 50" and "Over 50". Deaths in the City of Cape Town were reported only as "Europeans" and "Others". It was therefore impossible to relate deaths in age groups to their respective population numbers.

In the M.O.H, Cape Town's Annual Report for 1945-46 the Non-European deaths which occurred in Windermere were not shown separately for Coloureds, Natives and Asiatics. The 363 deaths among a population in Windermere of 13,678 Non-Europeans, about half of whom were Coloured, could therefore not be included in the calculation of age specific mortality rates separately for these races. In Table 37 these rates have been calculated on the total Coloured population of the city as obtained from the 1946 census, but omitting an unknown number of Coloured among the 363 Non-European deaths which occurred in Windermere. As the number of Coloured deaths in Cape Town (exclusive of Windermere) during the year was 2,947, the omission of Windermere Coloured deaths would probably not have lowered the rates appreciably.

The age and sex distribution of all the Non-European groups in Cape Town at the time of the 1951 census is not yet available. The age specific death rates for 1951 therefore are those of the Coloured population including those living in Windermere.

The trends in mortality in age groups of the Non-Europeans in Table 37 must therefore be accepted with some reserve.

From the figures in the table and Chart 6, it will be seen that

there has been a reduction in death rates in all age groups, and the speed of decline has decreased with increasing age. For the young groups the decline has been most marked since 1946. Whereas the 1951 rate for Europeans aged 0 - 4 years was reduced by seven-eighths of the rate in 1904, the rate of the "75 +" age group was reduced by only one-quarter of the earlier rate.

Among the Non-Europeans the trend has also been downward for the rates in each age group, but it has been more erratic than that of the European trend. Except for the oldest age group, the reduction has in each case been less than that of the respective European age specific rates.

Table 38 and Chart 7 show the ratio of Coloured to European age specific mortality rates in 1904 and in 1951.

TABLE 38

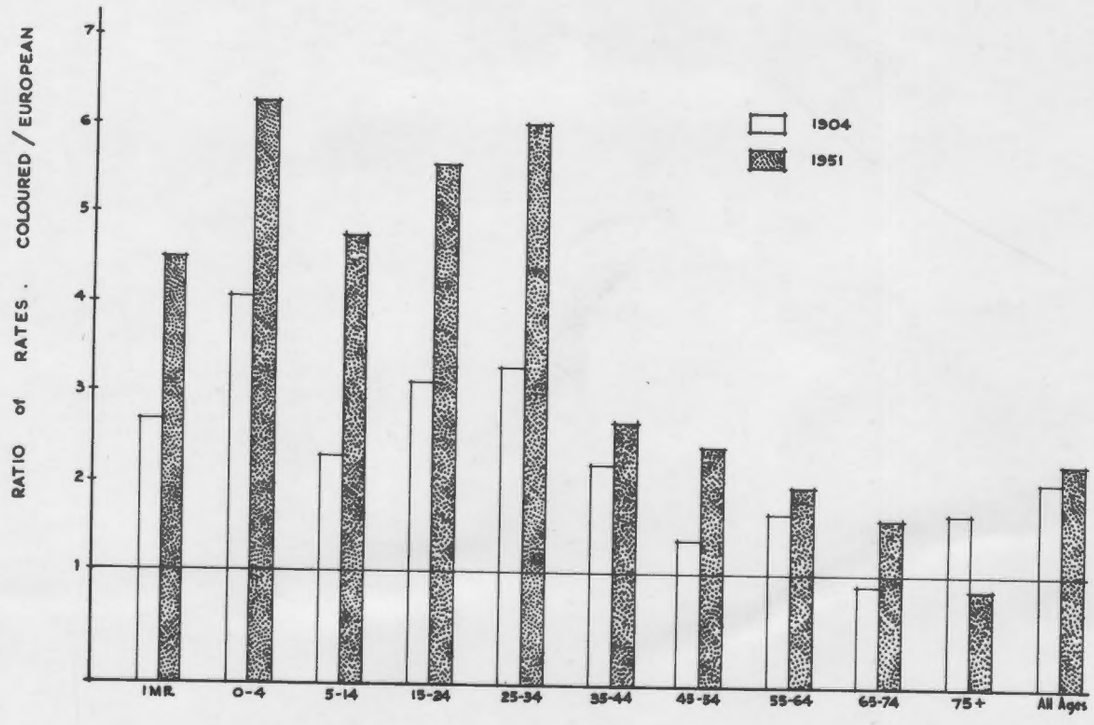
RATIOS OF COLOURED TO EUROPEAN AGE SPECIFIC MORTALITY RATES - 1904 AND 1951

AGE GROUP	1904	1951
0 - 4	3.5	6.4
5 - 14	2.0	4.0
15 - 24	2.7	4.7
25 - 34	2.8	5.0
35 - 44	1.9	2.4
45 - 54	1.3	2.5
55 - 64	1.6	1.8
65 - 74	0.9	1.5
75 +	1.6	0.9
All ages	2.5	1.1

It is readily apparent that the disparity between European and Non-European age specific mortality rates increased in this period in every age group except the oldest.

On the other hand, if we consider the reduction in the death rate for all ages together, i.e. the "crude death rate", European mortality has decreased by approximately 34 per cent whereas Non-European mortality has decreased by 60 per cent, more than twice as much.

CHART 7.



RATIOS of COLOURED to EUROPEAN MORTALITY RATES by AGE GROUPS.
CAPE TOWN 1904 AND 1951.

PUBLICATIONS - DR H.T. PHILLIPS.

(In support of M.D. Thesis presented to University of Cape Town).

1. Annual Reports, Coloured Section, 1946 and 1947: Lamont Health Centre 1948 to 1952 : In the Library of the Institute of Family and Community Health, P.O. Merebank, Natal.

   (one copy is in my possession and is available if required).

2. "A Whooping Cough Epidemic in an Urban Native Location". S. Afr. Med. J., 1951, 25, 110.

3. "Some Social and Ethnic Variations in the Physique of South African Nursery School Children". Arch. Dis. Child., 1953, 28, 226.

4. "The seasonal growth of Nursery School Children in relation to Social and Ethnic Factors". S. Afr. J. Clin. Sci., 1954, 5, 82.

5. "Magical Thinking in African Patients". Inyanga, 1954, 9, 46.

6. "Health Services in Universities". S. Afr. Med. J., 1955, 29, 443.

7. "The Domiciliary care of Sick Persons as part of a comprehensive health and medical care programme". (With Miss H.D.Cohn as co-author). S. Afr. Med. J., 1954, 28, 613.

8. "Some Social Aspects of Paediatrics". (With Dr E.J. Salber as co-author). S. Afr. Med. J., 1955, 29, 499.

This paradox can be explained by the weighting of the total rate which is due to the large proportion of Coloured deaths in the 0 - 4 age group. It has already been noted that in 1904 over 50 per cent and in 1951 40 per cent of the Coloured deaths occurred in children under 5 years of age. (+)

In absolute figures, the Coloured rate fell 125.8 per thousand in the 0 - 4 age group, while the European rate for the same age group fell 41.2 per thousand between 1904 and 1951. It is this tremendous saving in lives of young Coloured children which largely accounts for the fall in the crude death rate.

At the same time the smaller reduction in death rate for European children 0 - 4 years old represented a relatively larger fall for them as compared with the Coloured rate (87.7 per cent as compared with 77.2 per cent for Coloured children). Hence, although the relative reduction in age specific death rate was smaller in the Coloured population, the crude death rate fell relatively more for the Coloured population as a whole.

4. AGE AND SEX MORTALITY RATES.

It has been seen that both age and sex affect mortality rates. For proper comparison to be made between populations it is necessary to allow for both biological factors.

The calculation of the age and sex specific death rates in Cape Town was hindered by the same difficulties mentioned in the calculation of

---

(+) From 1904 to 1951 the death rate for Coloured children in this age group fell from 162.9 to 37.1 per 1,000. If this rate had remained at the 1904 level in 1951 there would have been $\frac{32,271 \times 162.9}{1,000}$ = 5257 deaths in the 0-4 Coloured group. In actual fact there were only 1,196 deaths in that age group in 1951. If these additional lives (i.e. 5257-1196 = 3061) had been lost, the total Coloured deaths for 1951 would have been increased from 2918 to 2918+3061 = 5979. If the death rate for Coloured children aged 0 - 4 years in 1951 had remained at the 1904 level, the crude death rate would have been $\frac{5979 \times 1000}{207544}$ = 28.8 per thousand, i.e. more than doubled.

TABLE 39

AGE AND SEX SPECIFIC MORTALITY RATES CAPE TOWN, 1926 - 1951

(a) EUROPEANS

AGE GROUP	1926		1936		1946		1951	
	M	F	M	F	M	F	M	F
0 - 4	20.1	20.5	16.5	14.5	11.2	8.8	7.1	4.4
5 - 14	1.7	1.8	2.3	1.8	0.7	1.0	0.6	0.4
15 - 24	2.6	1.4	2.2	2.7	0.8	1.6	1.1	0.7
25 - 34	3.4	2.9	2.8	3.5	3.3	2.9	1.2	1.5
35 - 44	5.4	5.7	7.5	4.9	5.7	2.7	4.8	2.8
45 - 54	14.5	7.7	16.1	7.6	13.3	7.6	10.0	7.0
55 - 64	27.3	18.2	31.2	16.6	27.3	16.0	24.6	11.9
65 - 74	67.1	40.0	68.3	41.1	52.2	33.3	56.6	34.7
75 +	99.7	113.3	128.3	128.9	113.7	102.0	112.1	108.3
All ages	11.2	8.6	12.6	9.6	11.1	8.8	10.5	8.6

(b) NON-EUROPEANS

AGE GROUP	Total Non-Europeans					
	1926 (1)		1936 (1)		1946 (2)	
	M	F	M	F	M	F
0 - 4	101.6	97.5	75.7	73.3	62.7	55.4
5 - 14	5.3	4.7	4.9	5.0	4.9	4.0
15 - 24	7.2	8.6	7.5	8.8	6.4	7.9
25 - 34	10.1	9.2	11.1	13.0	9.6	9.8
35 - 44	15.5	14.0	16.9	12.7	18.6	12.9
45 - 54	24.5	25.2	23.7	20.3	36.4	18.7
55 - 64	65.8	49.3	53.3	43.8	58.8	37.0
65 - 74	89.7	85.1	94.2	67.2	92.7	54.6
75 +	120.3	124.2	122.2	101.9	147.4	95.4
All ages	25.2	24.5	24.1	22.4	21.5	17.4

(c) 1946, COLOURED AND NATIVE. 1951, COLOURED.

AGE GROUP	Coloured		Native		Coloured	
	1946 (3)		1946 (4)		1951 (5)	
	M	F	M	F	M	F
0 - 4	51.1	45.0	127.9	99.3	40.2	33.9
5 - 14	4.2	3.4	12.4	9.7	2.3	1.7
15 - 24	5.4	6.9	6.5	13.1	3.9	4.4
25 - 34	11.5	9.1	5.3	9.6	7.6	6.6
35 - 44	20.4	11.7	9.7	11.8	12.3	6.4
45 - 54	35.8	17.1	25.3	20.9	26.5	16.5
55 - 64	58.7	35.7	48.9	32.6	41.2	24.3
65 - 74	96.2	52.3	62.5	62.5	85.3	56.8
75 +	89.4	57.1	22.2	41.7	121.5	91.9
All ages	20.6	15.3	16.6	23.6	15.9	12.5

1. Deaths of 116 Natives in Ndabeni not included, but computed on population of 101,336 Non-Europeans including 5,318 in Ndabeni.
2. Deaths of all Non-Europeans including Langa and Windermere.
3. Coloured deaths in Windermere not included.
4. Native deaths in Windermere not included but Langa deaths included.
5. Windermere deaths included.

age specific death rates. In addition, figures for deaths which occurred in Cape Town were not separated into male and female before 1925. It was therefore possible to calculate sex specific death rates only from 1926 onwards. These rates are shown in Table 39.

Apart from the Native population in 1946, which will be discussed separately, all the groups behaved in a similar pattern. Starting with a high, or relatively high mortality rate in the 0 - 4 group, the rates dropped to their lowest level in the 5 - 14 (or occasionally the 15 - 24) age group. Thereafter the rates rose with increasing age. The trend of mortality of the oldest age groups was erratic at times, but it must be remembered that they often consisted of numerically very small groups.

The striking feature about the age and sex specific rates was that, with few exceptions, they were higher in each age group for males than females. The exceptional groups were to be found between 5 and 34 years of age, where the female rates were somewhat higher. In every population analysed there was at least one age group where this occurred.

The secular trend was similar to that described in discussing the age specific rates undifferentiated for sex. If anything, it appeared that female death rates have fallen more than male, especially for the younger age groups in the period 1926 to 1951.

The Native age and sex specific rates for 1946 were somewhat different from the others. The crude death rate for females was higher than that of the males, the lowest rates were in the 25 - 34 age group for both males and females and the increase in death rates with age was rather irregular. After the age of 25 the rates for Native males were surprisingly low as compared with those of Coloured males, especially in view of the fact that Native female death rates were comparatively high.

The explanation for all these irregularities is almost certainly that after the age of 15 years there is a high selection of male Natives who live in Cape Town. Many, if not most, are migrant labourers, who come to Cape Town only if they feel fit enough to work, and return to the rural areas if they feel ill or are considered unfit to work. Many who fall ill in Cape Town go home if they think they are about to die. The oldest age groups of Natives are particularly small in number and

may easily give rates which are unexpected. In addition, difficulties in ensuring accurate enumeration of population and registration of deaths among Natives probably account for at least a part of the irregularity observed.

5. COMPARISON WITH OTHER POPULATIONS.

Difficulties arise in making international comparisons of age and sex specific death rates because of the varying ways in which the ages are grouped. The relative smallness of the Cape Town European and Coloured populations did not justify using groupings of less than ten years after the age of five. Deaths in Cape Town after the age of 15 are classified in 10 year age groups by the M.O.H. in his Annual Reports. Table 40 illustrates the differences in mortality specific for age and sex for Cape Town and other populations.

This table shows that in all the figures quoted the age groups 5 - 9 and 10 - 14 had the lowest mortality rates. Mortality was fairly high in infancy and in the oldest age groups. In populations with high mortality, such as the Coloured in Cape Town and the New Zealand Maoris, the proportionate divergence from populations with low mortality became less with increasing age. For example, the mortality for Maoris under 1 year was over three times that of New Zealand white infants. At 55 to 59 it was two and a half times, and at 85 years and over about one and one-eighth times as great.

On the whole New Zealand Whites and the Netherlands had the lowest age specific death rates. The rates of England and Wales were not much higher. The South African European age specific death rates for 1951 are not available, but the 1948 rates are considerably above those of New Zealand Whites, the Netherlands and England and Wales of 1951. The Cape Town European rates are better than the South African European rates for the ages 5 to 34, but it must be remembered that the Cape Town figures are more recent by three years than those of the latter population. The Cape Town Coloured rates are higher than those of all the other groups shown in the table, except for the 55 to 64 age group where the Coloured rate is lower than the Maori rate. This appears to be due mainly to the high death rate among the Maori females in these age groups.

TABLE 40.

COMPARISON OF DEATH RATES SPECIFIC FOR AGE AND SEX IN VARIOUS POPULATIONS.

	All Ages	Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cape Town : Eur. 1951.																				
Both sexes	9.5	5.8		0.5		0.9		1.4		3.8		8.4		17.4		44.0				109.9
Male	10.5	7.1		0.6		1.1		1.2		4.8		10.0		24.6		56.6				112.1
Female	8.6	4.4		0.4		0.7		1.5		2.8		7.0		11.9		34.7				108.3
Cape Town : Col. 1951.																				
Both sexes	14.3	37.1		2.0		4.2		7.0		9.0		21.1		31.5		67.8				102.9
Male	15.9	40.2		2.3		3.9		7.6		12.3		26.5		41.2		85.3				121.5
Female	12.5	33.9		1.7		4.4		6.5		6.4		16.5		24.3		56.8				91.9
South Africa : Eur. 1948.																				
Both sexes	8.9	37.2	3.1	1.2	0.9	1.3	2.0	2.2	2.6	3.5	5.1	7.1	11.7	16.3	23.8	35.3	53.4	79.9	125.2	216.8
Male	10.2	42.2	2.9	1.5	1.0	1.6	2.6	2.5	2.8	3.9	6.0	8.6	14.6	20.8	30.2	43.2	62.0	91.5	134.6	231.2
Female	7.6	32.1	3.2	0.9	0.7	1.0	1.3	1.9	2.4	3.0	4.2	5.6	9.0	12.0	17.7	27.4	44.8	68.7	116.8	206.1
England & Wales: 1951.																				
Both sexes	12.5	30.0	1.4	0.6	0.5	0.8	1.1	1.3	1.6	2.1	3.1	5.3	8.7	13.9	22.6	36.6	58.5	97.8	159.7	280.9
Male	13.4	34.0	1.4	0.7	0.6	0.9	1.4	1.5	1.7	2.3	3.5	6.3	11.2	18.5	30.6	48.0	73.8	117.5	179.4	318.2
Female	11.8	25.8	1.3	0.4	0.4	0.6	0.9	1.2	1.5	1.9	2.7	4.2	6.5	10.1	16.3	28.2	47.9	84.5	147.5	264.2
Netherlands: 1951.																				
Both sexes	7.5	25.6	1.7	0.7	0.5	0.6	0.9	1.1	1.2	1.6	2.5	3.8	6.0	9.5	15.3	26.1	43.7	78.5	130.9	226.6
Male	7.8	28.7	1.7	0.8	0.6	0.8	1.2	1.4	1.4	1.7	2.7	4.3	7.0	10.8	17.2	28.1	45.8	81.6	135.4	234.9
Female	7.2	22.2	1.6	0.5	0.4	0.4	0.6	0.9	1.1	1.4	2.2	3.2	5.1	8.3	13.6	24.3	41.8	75.7	127.0	220.0
New Zealand: (Whites) 1951.																				
Both sexes	9.6	24.0	1.3	0.6	0.4	1.0	1.3	1.4	1.6	2.0	3.0	5.0	7.8	13.0	20.4	31.1	50.3	81.8	132.3	240.5
Male	10.5	28.3	1.4	0.7	0.6	1.3	1.8	1.8	1.9	2.4	3.5	5.9	8.9	15.7	24.8	38.2	58.3	89.7	145.0	244.4
Female	8.7	19.4	1.2	0.4	0.3	0.6	0.8	1.1	1.3	1.6	2.5	4.1	6.7	10.6	16.3	24.4	42.9	74.8	121.7	237.7
New Zealand: (Maoris) 1951.																				
Both sexes	11.4	74.1	6.2	2.3	1.7	3.5	4.3	3.6	5.3	6.5	9.1	13.3	24.2	33.1	46.9	56.3	71.5	154.7	144.6	271.9
Male	12.5	83.7	6.6	2.3	1.3	4.5	5.8	3.8	6.2	8.0	7.2	10.7	23.9	32.7	42.7	73.8	78.4	152.9	150.4	369.0
Female	10.4	63.9	5.8	2.3	2.1	2.5	2.9	3.4	4.4	4.9	11.3	16.3	24.6	33.7	51.9	35.1	63.2	157.1	139.5	215.3

Sources: (1) Cape Town rates - based on data from M.O.H., Cape Town, 1950-51, and Census of Union of South Africa 1951.
(2) Other figures: United Nations 1953.

The ratios of male to female mortality rates in Cape Town in 1926 and 1951 among Europeans and Coloureds are shown in Table 41.

TABLE 41

RATIOS OF MALE TO FEMALE MORTALITY - CAPE TOWN 1926 AND 1951

	EUROPEANS		COLOUREDS	
	Ratio 1926	Ratio 1951	Ratio 1926	Ratio 1951
0 - 4	0.98	1.61	1.04	1.18
5 - 14	0.94	1.50	1.13	1.35
15 - 24	1.85	1.56	0.84	0.89
25 - 34	1.17	0.60	1.10	1.17
35 - 44	0.95	1.71	1.11	1.92
45 - 54	1.88	1.43	0.97	1.61
55 - 64	1.50	2.07	1.33	1.69
65 - 74	1.68	1.63	1.05	1.50
75 +	0.87	1.03	0.97	1.32
All ages	1.30	1.22	1.03	1.27

From the table it is apparent that the excess of male mortality tended to increase in the period 1926 to 1951 for most age groups. This trend was less regular for the Europeans.

STANDARDISATION OF DEATH RATES.

The insufficiency of crude death rates as a measure of relative vitality of the European and Coloured populations of Cape Town at different times has already been referred to. Specific death rates for various age groups and for males and females have been calculated to show the decline in mortality in the separate groups. But only by standardising mortality rates can we get single indices of the vitality of the various communities as a whole at different times.

There were certain difficulties in choosing a standard population on which to base a comparison because the age compositions of Coloureds and Europeans have been so markedly different. Using a Coloured population as a standard would weight mortality rates in childhood, and using a European population would weight rates in older age groups. Age distributions among Europeans in the early part of the period under review were most irregular. To overcome these difficulties, the rates have been standardised on the basis of the age and sex distributions of both the European and the Coloured population of 1951. The method used was the "direct" one (Hill, 1955, Chapter 18) and the

details are shown in Appendix D.

The results of standardising the mortality rates in these two ways are shown in Table 42. In both cases the 1904 mortality rates have been standardised for age only because data on the sexes of those who died in that year are not available.

TABLE 42

COMPARISONS OF 1904 AND 1951 MORTALITY RATES IN CAPE TOWN

			MORTALITY RATES 1904	MORTALITY RATES 1951	REDUCTION 1904 - 1951
European:	Crude		14.3	9.5	33.6 per cent
	standardised	(1)	24.1	9.5	60.6 " "
		(2)	17.8	4.9	72.5 " "
Coloured:	Crude		36.2	14.3	60.5 per cent
	standardised	(1)	44.7	19.1	57.3 " "
		(2)	43.2	14.3	66.9 " "
Ratios: Coloured:European					
	Crude		2.5	1.5	
	standardised	(1)	1.8	2.0	
		(2)	2.4	2.9	

(1) Standardised on 1951 European population.
(2) Standardised on 1951 Coloured population.

Table 42 shows that in the period 1904 to 1951 the reduction in crude mortality rates among Europeans (33.6 per cent) was far less than that among Coloureds (60.5 per cent).

When the rates were standardised the reduction was slightly more among Europeans than among Coloureds, and the same applied whether either of the two standard populations mentioned above was used.

The ratios of Coloured to European crude mortality rates decreased considerably in the period under review. When standardised rates were compared, on the other hand, the disparity between the two races increased slightly and the same applied whether either of the two standard populations was used.

DISCUSSION.

It has been demonstrated that in Cape Town crude mortality rates for both European and Non-European groups of the population have decreased in the past 50 years. In the former the decline was considerable in the first twenty years and changed very little thereafter.

In the latter the main decline occurred in the last fifteen years when the rates were approximately halved.

Similar trends have been seen in other populations. In countries with relatively low death rates such as England and Wales, Netherlands and New Zealand, there have been comparatively slight declines over the past fifty years. In these countries where mortality began to drop in the seventeenth century, the decrease in the rates was most marked from 1870 to 1900. (Sand, 1935, p. 46).

In technically advanced countries there has been an increasing preponderance of older people in the population as a result of the steady fall in mortality. Greenwood (1925) expected the death rate in England actually to start rising again from 1930 onwards. It did not do so because of the unexpected and marked fall in mortality, especially of children. (Martin, 1954).

In making comparisons, therefore, it is necessary to take differences of age distribution into account. The age distribution of the population in the Netherlands in 1952 was 0 - 4 years 10.9 per cent, 5 to 40 years 62.1 per cent, and 45 and over 27.6 per cent. The corresponding Cape Town European figures in 1951 were 9.1, 62,0 and 29.0 respectively - a very similar distribution. The Netherlands rate is therefore some indication of how much even the mortality rates of the Europeans of Cape Town could still improve; how much more so does this apply to Non-Europeans.

When comparing the rates of Cape Town or South African Europeans with those of European countries it must also be remembered that in the former groups we are dealing with populations where the lower social and economic classes are poorly represented, and we are thus comparing the better off groups in one city or country with the total population of another. Viewed in this light, the mortality rates of the Europeans of Cape Town or South Africa are much worse than those of England and Wales, and the Netherlands.

Moriyama (1954) discussing the trends in mortality rates in "areas of low mortality" pointed out that there was a rise in mortality in virtually all these countries during World War II. Although there was no apparent rise during the war in the death rate of South African

Europeans, there were slight and moderate rises in the death rates of Cape Town Europeans and Coloureds. Since the war there have been declines in the rates for virtually all countries rendering vital statistics, and this trend has been seen in Cape Town too.

1. BIOLOGICAL FACTORS.

Racial differences.

The differences in mortality in various racial groups may be regarded by some as evidence of racial differences in vitality. A comparison of expectation of life at birth and at one year reveals considerable variation in different populations. (Table 43).

TABLE 43.

LIFE EXPECTATION IN VARIOUS POPULATIONS AT BIRTH AND AT 1 YEAR

		MALE		FEMALE	
		0 yrs.	1 yr.	0 yrs.	1 yr.
SOUTH AFRICA					
European	1945-47	63.78	65.51	68.31	69.63
Coloured	"	41.70	47.81	44.00	49.53
Asiatic	"	50.70	53.05+	49.75	51.62+
Native	"	35.7	43.6	37.1	45.2
UNITED STATES					
White	1948	65.5	66.8	71.0	71.9
Non-white	1948	58.1	60.2	62.5	64.2
ENGLAND & WALES	1949	66.01	67.50	70.63	71.66
NETHERLANDS	1947-49	69.4	70.8	71.4	72.4

+ = Life expectation at 5 years.

Sources: 1. South African Europeans, Coloureds and Asiatics - Union of South Africa Yearbook for 1952-53.

2. South African Natives - Sadie (1951).

3. Other populations - World Health Organisation (1952). Table 175.

Table 43 shows that in 1945 - 1949 there were considerable differences in life expectation in various populations. That of South African Europeans was lower than that of the populations of England and Wales, the Netherlands, and the white people of the United States, but it was considerably higher than that of the Non-Europeans. The inter-racial differences in life expectation in South Africa are those one would expect from the mortality rates demonstrated in Cape Town.

It is interesting to note how much higher the life expectations

of Non-white people in the United States are compared with Non-Europeanns in South Africa.

There has been an increase in life expectation in nearly every country in recent times, so that even if genetic differences in longevity do exist, they are far less important at present than other factors. The great decrease in mortality among the Coloured people of Cape Town since 1944 is further evidence of this.

An important exception to the rule that life expectation has been increasing generally is provided by the Coloured population in South Africa between 1935-37 and 1945-47. In this period the expectation of life actually decreased at practically all ages for Coloured males, and at ages over 39 for Coloured females. This fact was attributed to increased mortality from tuberculosis by the Director of Census and Statistics (U.G. 14/1951, pp. xvi - xviii) and will be discussed later in this study.

Sex differences in mortality.

The higher male death rate in almost every age group in the Cape Town age and sex specific rates has already been referred to. The same trend was seen in the rates for various other populations shown in Table 40. A notable exception was the Maori population where in the 10-14 and 40-64 age groups the females had considerably higher death rates than the males. The same peculiarity was seen in the age and sex specific death rates of the Maoris for several other years from 1940. (United Nations, 1953, p. 210-211). A similar trend was seen in the age and sex specific mortality rates for Natives in 1946. (Table 39).

Newsholme (1923, p. 205) noted that except about the age of puberty, males had mortality rates greater than females, both in England and in the United States. He noted further that the male excess of infantile mortality seemed to be increasing and he suggested that as infant mortality rates declined, unavoidable deaths became proportionately more important. A higher proportion of male than of female mortality was therefore unavoidable, which was confirmed, he thought, by the greater male excess in the earlier months of infancy. Similar statistics were seen in foreign countries. It is interesting that the female excess mortality at puberty has now disappeared in England and Wales.

This is probably due to the decline in mortality from tuberculosis, which is the only disease of importance at this age in which female susceptibility appears greater than male.

Wiehl (1948) remarked on the increasing excess of female over male expectation of life at birth in the United States. She reported that "the excess life expectation for white females as compared to males increased from 2.2 years for the period 1919-21 to 5.1 years in 1945, and this is an increase in the percentage excess from 3.9 to 7.9 per cent. For Non-Whites the excess life expectation for females is less than for Whites, but it too has been increasing". From her data she concluded that the greater increase in life expectancy for women than for men was due almost entirely to a more favourable trend in female mortality rates at adult ages. For every age group the excess male mortality had increased for both Whites and Non-Whites. For Non-Whites variation in the excess according to age was not large, but for Whites it varied from 30 per cent to 60 per cent being highest at 15 - 30 and 45 - 60.

Martin (1951) in a discussion of the trends of male and female mortality stated that the higher death rate among males in England and Wales seemed to be of a permanent nature, not peculiar to that country nor to any set of living conditions that was known to affect the general death rate. "A satisfactory explanation has not been found for the male excess in the general rate, although for some causes of death a part of the difference between the sexes can be ascribed to occupational hazards, physiological factors or social habits .... However, the large increase in the proportion of women engaged in industry in recent years has not, as far as can be ascertained, affected the mortality sex ratios.

In 1841-45 the age adjusted male mortality was 9.6 per cent higher than the female, while in 1931-35 it was 27.6 per cent higher".

Martin pointed out that industrial conditions have improved considerably in the last fifty years, and should have affected male death rates more than female, and yet the female rate had declined more rapidly than the male rate. Furthermore, differences in the environment of male and female infants cannot explain the high mortality sex ratios in early life which were highest with the lowest infant mortalities. For adults

Martin found that in most age groups the mortality sex ratios were highest in upper social classes and lowest is the lower social classes, but the evidence of an occupational risk was not very conclusive.

Sowder (1954) reviewing the sex specific mortality rates in the United States and in Florida from 1920 to 1950, also stressed the increasing difference between male and female mortality rates. Using "age adjusted" rates for the males and females, he pointed out that in 1920 the death rate among white males in Florida was 14 per cent higher than the rate for white females. In 1930 the difference was 34 per cent, in 1940 53 per cent, and in 1950 no less than 62 per cent. He stated that the same trend was found for the United States as a whole and for the non-white population, though the differences are less than for white people in Florida. He found that the sex difference in 1950 was greatest in the 15 - 24 age group, whereas in 1920 it was greatest for infants. He suggested that perhaps women react to the worry, frustration, disappointment and tension of modern life "by being more vocal about these conditions, through tears or occasional hysterics. The reaction of men, on the other hand, may be in the form of coronary disease, hypertension or ulcers".

2. SOCIAL FACTORS.

The differences in the social conditions of the Europeans and the Coloured people in Cape Town have already been discussed. It is sufficient to state here that the Coloured population are at a disadvantage generally from the point of view of income, occupation, housing, education, availability of medical services, etc. (See Chapter II). Many studies have related mortality levels in other communities with social conditions.

Occupation.

Ramazzini (1633 - 1714) is generally regarded as the founder of industrial medicine. In his great work "De mortiis artificum diatriba" Ramazzini described occupational diseases, sought their technological causes and detailed the precautions which may be taken to prevent them. He pointed out that apart from occupational risks, the way of life which is forced upon the working classes by lack of means is no less detrimental to their health. (Sand, 1952, pp.307-312). The inequality

of the social classes in respect to sickness and death has been extensively reviewed by Sand. (1935, Chapter IX). He quoted numerous authors from Hippocrates to modern writers such as Chadwick in England and Chapin in the United States to the effect that the poor are more liable to die young than are those who are better off.

The Registrar-General of England and Wales has recognized the importance of the implications of occupation on the lives of the worker himself and on his family, by relating mortality rates not only of the occupied males, but also of their wives and infants to the occupation of the head of the family. The reports of the Registrar-General on occupational mortality provide a most valuable basis for the study of the relationship of social factors to mortality. (Great Britain, Registrar-General, 1954). The Registrar-General classifies all adult males into five main social classes based on occupation, viz:

Social class I Professional.
Social class II Intermediate.
Social class III Skilled.
Social class IV Partly skilled.
Social class V Unskilled.

The ratios of mortality of adult males in England and Wales in three different periods according to social class are shown in Table 44.

TABLE 44.

STANDARDISED MORTALITY RATIOS OF MEN AGED 20-64 BY SOCIAL CLASS.

YEARS	SOCIAL CLASS					All occupied and retired.
	I	II	III	IV	V	
1921-23	82	94	95	101	125	100
1930-32	90	94	97	102	111	100
1950	97	86	102	94	118	100

Source: Great Britain, Registrar-General (1954) p. 10.

Whereas in 1921-23 and 1930-32 there was a uniformly rising mortality gradient for men aged 20-64 from Social Class I to V, in 1950 the Standardised Mortality Ratios for Classes II and IV were unexpectedly

low. The Registrar-General remarked that it was possible that the 1950 figures, which were preliminary and based on a 1 per cent sample of the population, were more subject to random fluctuation than in the two previous studies which were based on much bigger samples. He advised caution in accepting these figures of low mortality in Classes II and IV.

In reporting on the death rates of men at separate ages for the three time periods, the Registrar-General stated that "at ages up to 55 there has been a large decline in mortality in each of the social classes. At ages 55 and over, there has been no improvement in Social Class I since 1921-23 and no improvement in Social Class III between 1930-32 and 1950. Looking at the figures from the point of view of social class gradient, this has been maintained at each period up to age 54. At higher ages although the gradient was rather less uniform it was fairly definite in 1921-23, but less so in 1930-32. In 1950 the gradient had disappeared at ages 65-69, with lowest rates in Social Classes II and IV; and at ages 70 and over recorded mortality was highest in Social Class I and lowest in Social Class V. Again it would be wise to await the five-year tabulation before accepting those comparisons without reserve". (pp. 10-11).

Married women were similarly classified into five main social classes according to their husbands' occupations in 1930-32 and 1950. (see Table 45). This comparison helps to measure the effects of social conditions other than the direct influence of occupation.

TABLE 45.

STANDARDISED MORTALITY RATIOS OF MARRIED WOMEN AGED 20-64 BY SOCIAL CLASS OF HUSBAND

YEARS	SOCIAL CLASS					All married women
	I	II	III	IV	V	
1930-32	81	89	99	103	113	100
1950	96	84	101	104	117	100

Source: Great Britain (Registrar-General, 1954, p. 17).

It will be seen that in 1930-32 there was a uniform upward progression of mortality from Social Class I to Social Class V. In 1950 the lowest standardised Mortality Ratio was recorded in Social Class II, the ratios in the other classes following a regular pattern.

In reporting on the death rates of women at separate ages in the five social classes for the two periods studied, the Registrar-General stated that "in 1930-32 a well defined mortality gradient from Social Class I to V was discernible at each age from 20-24 to 70 and over. In 1950 the gradient at ages 20-24 had become much steeper owing to remarkable reductions in mortality particularly in Social Classes I and II. At all higher ages Social Class II had slightly lower death rates than Social Class I. With increasing age the mortality gradient from Social Classes I and II to V lessened, and disappeared completely at ages 70 and over".

Infant and maternal mortality rates in relation to social classes in England and Wales will be discussed under separate headings.

Taking the European and the Coloured (Non-European) sections of the population of Cape Town as representing, among other things, two separate social classes, it is interesting to see how far the Cape Town experience corresponds with that of England and Wales. Comparative trends in England and Wales and in Cape Town are shown in Table 46.

In both England and Wales and in Cape Town there has been a fall in the age specific death rates for all social classes. In both populations the reduction has been greater in the young than in the old.

Up to the age of 34 the Europeans had a greater reduction in mortality. Thereafter the rates for Non-European females improved most, but the other three groups had irregular reductions, all tending to diminish with age.

In England and Wales the females of Social Class I had the bigger reductions up to the age of 34. Thereafter the rates of females of Social Class V showed the greatest improvement, but the other three groups had irregular declines, all tending to diminish with age. However, the rates of Social Class V improved more for both males and females over the age of 64.

TABLE 46

MORTALITY TRENDS IN CAPE TOWN AND ENGLAND AND WALES BY RACE AND CLASS

(a) Reduction in rates : Cape Town 1926-1951 (rates per 1,000)

AGE GROUP	EUROPEANS						COLOUREDS					
	Male			Female			Male			Female		
	1926	1951	Red. %	1926	1951	Red. %	1926+	1951	Red. %	1926+	1951	Red. %
15-24	2.6	1.1	58	1.4	0.7	50	7.2	3.9	46	8.6	4.4	49
25-34	3.4	1.2	65	2.9	1.5	48	10.1	7.6	25	9.2	6.5	29
35-44	5.4	4.8	11	5.7	2.8	51	15.5	12.3	21	14.0	6.4	54
45-54	14.5	10.0	31	7.7	7.0	9	24.5	26.5	-8	25.2	16.5	35
55-64	27.3	24.6	10	18.2	11.9	35	65.8	41.2	37	49.3	24.3	51
65-74	67.1	56.6	16	40.0	34.7	13	89.7	85.3	5	85.1	56.8	33
75+	99.7	112.1	-12	113.3	108.3	4	120.3	121.5	-1	124.2	91.9	26

(b) Reduction in rates : England and Wales 1930-32 to 1950. (rates per 100,000

AGE GROUP	SOCIAL CLASS I						SOCIAL CLASS V					
	Males			Married females			Males			Married females		
	1930-32	1950	Red. %	1930-32	1950	Red. %	1930-32	1950	Red. %	1930-32	1950	Red. %
20-24	334	140	58	242	24	90	336	167	50	310	119	62
25-34	288	47	49	222	90	59	374	224	40	371	178	52
35-44	439	241	45	332	210	37	667	417	37	507	264	48
45-54	984	792	20	623	451	28	1302	1041	20	853	600	30
55-64	2237	2257	-1	1371	1172	15	2535	2523	1	1825	1261	31
65-69	4549	4786	-5	2731	2661	3	5105	4663	9	3545	2484	30
70+	1047	12290	-2	6108	5554	9	12368	10559	15	7610	5652	16

+ = Rates for all Non-Europeans, of whom 86 per cent were Coloured.

Sources: (a) Based on data from M.O.H., Cape Town, and Censuses of the Union of South Africa

(b) Based on data from Great Britain, Registrar-General (1954), Tables 3 and 9.

Housing.

The effects of poor housing upon the health of the inhabitants are difficult to separate from the other concomitants of poverty. Rarely, if ever, is housing improved without other factors being changed too. Improvement in housing has been associated with a rise in mortality rates in one carefully investigated natural experiment described by M'Gonigle and Kirby (1936, Chapter VII). In this instance the increased mortality was ascribed to higher expenditure on rent and transport,

with a consequent lower expenditure on food.

The effects of housing conditions on the mortality from specific diseases have been investigated by a number of authors, but these will be reviewed separately when deaths from these diseases are discussed.

In Cape Town housing conditions for Non-Europeans have always been worse than for Europeans, and it is possible that poor housing has played a part in producing the differences between European and Non-European mortality rates.

Although it is difficult to prove scientifically, it is almost certain that overcrowding and poor housing and sanitation per se play a considerable part in raising the general mortality rates of the Coloured people by increasing the incidence of infectious diseases.

Nutrition.

The effects of human malnutrition, like those of poor housing on mortality are difficult to separate in a scientific manner from the other elements of the poverty complex.

There can be no doubt that much of the increased mortality under such conditions as Holland endured in the winter of 1944-45 ("The Hunger Winter") when the crude death rate rose from 8.7 per 1,000 pre-war to 15.3 in 1945 and fell again to 8.5 in 1946 was due largely to under-feeding, directly or indirectly. Similar rises occurred in most other countries where among other hardships, the inhabitants were short of food.

The Coloured people of Cape Town because of the high incidence of poverty among them, are almost certainly subject to greater degrees of under-nutrition as compared with the Europeans of the city.

Urban versus rural factors.

"When, in the middle of the seventeenth century, public attention was first focussed on the problems of human mortality, it was noticed that urban centres offered a much smaller chance of survival for their inhabitants than did rural areas. One of the four basic demographic principles expounded by JohnGraunt (in 1662) was that the urban death rate normally exceeds that in rural areas. As the industrial revolution advanced, urban-rural differentials became so alarming that cities were categorized as the "graveyards of mankind", attracting young

people from the provinces only to kill them off in a matter of a few years". (United Nations, 1954, p. 13).

This applied in the early years of the twentieth century to the United States (Wiehl, 1948) and to Britain (Newsholme, 1923 p.257). In the United States there has been a greater improvement in mortality in the urban as compared with rural rates (Dorn, 1942). Wiehl, however, points out that migration, racial and other cultural differences in the composition of the population may affect the death rates in ways which do not allow valid comparisons to be made.

In South Africa statistics for comparing urban and rural mortality are scanty, especially for Non-Europeans. The Union Health Department provides the following figures for Europeans in South Africa.

TABLE 47

DEATH RATES FOR URBAN AND RURAL AREAS IN SOUTH AFRICA - EUROPEANS

	Urban	Rural
1948	9.1	8.5
1949	9.0	8.3
1950	8.9	8.1
1951	8.9	8.4
1952	8.3	8.7

Source: Union of South Africa Official Yearbook 1952 - 53, p. 113.

According to Sadie (1951) the expectation of life in 1945-47 among European South African females and males was greater in rural than in urban areas. The differential in the case of females was only 0.7 years at birth, as against 3 years for males. The age specific mortality rates of the rural population were, however, not uniformly lower than those of the urban communities. The probabilities of dying at different ages were as follows:

Age 0 : rural rate lower than urban rate.

Ages 1 to 23 - 27 : rural rates exceeded urban rates.

Ages 28 to 73 - 77 (males) : rural rates were lower.

Ages 28 to 78 - 82 (females) : rural rates were lower.

Ages 78 (males) and 83 (females) upwards : rural rates exceeded the urban.

Sadie suggests that after the neonatal period until about the age of 28, and again in extreme old age, the proximity of medical facilities in the town outweighs the importance of the benefits of rural life.

In general it would seem that for Europeans urban life in South Africa in 1945-7 exerted very few deleterious effects upon the lives of female urban residents, but lessened the expectation of life of male urban residents by about three years at each age up to about 48 years. However, in periods of mass migration from rural to urban areas, there is also the possibility that there are variations in the viability of those who move to town and those who remain in the country. This may play a part in producing the differences in urban and rural mortality rates.

Although we know that crude death rates for Coloureds in Cape Town have been lower than in South Africa as a whole in 1950-53, it would be interesting to know what the effects of urban life were on the longevity of Non-Europeans, and to know if the disadvantages of life in densely populated areas like those to be found in Cape Town are outweighed by the economic and technical facilities more readily available in towns.

CHAPTER VI

MATERNAL AND INFANT MORTALITY

MATERNAL AND INFANT MORTALITY AS INDICES OF HEALTH.

In the heyday of the theories of Natural Selection and Survival of the Fittest, prominent scientists believed that early death was Nature's way of eliminating the biologically inferior, and that a reduction in childhood mortality by social reform would inevitably lead to an increase in mortality in young adults. (Pearson, 1912). Experience in the past half century has shown that they were wrong and that a low level of infant and child mortality generally goes hand in hand with low death rates at all ages. (United Nations, 1954, pp.2-3).

The health of children has been found to be one of the most sensitive indices of social and economic conditions. The young organism depends at first entirely upon its mother for the provision of its physical, biological and social needs and the infant is completely enveloped by the narrow world surrounding the family and household. As it matures the health of the child depends more and more upon gradually widening influences outside of the home. The standards of health of infants are therefore accurate reflections of the salubrity of home and family, the basic socio-biological unit.

In recent studies the health of mothers has been shown to be closely connected with the health of infants, and for this reason maternal and infant mortality will be considered and discussed together in this study.

MEASURES OF MATERNAL AND INFANT MORTALITY.

A number of methods of measuring maternal and infant mortality experience are in common use. The most regularly employed statistics are:

MATERNAL MORTALITY RATE:

The most accurate expression of maternal or puerperal mortality rate is

$$\frac{\text{Number of deaths from pregnancy or childbirth during the year}}{\text{Number of pregnant women in the mid-year population}} \times 1000$$

As pregnancy is not notifiable, but births are registered, it is much simpler to relate puerperal deaths to the number of births registered, thus:

$$\frac{\text{Number of puerperal deaths during year}}{\text{Number of births during year}} \times 1000$$

. Strictly speaking, the number of births should include live and still-births. If the denominator

used is "live births only", the maternal mortality rates for the year 1947-48 in Cape Town were 1.04 for Europeans and 2.10 for Non-Europeans. If still-births are included in the denominator, the rates become 1.02 and 1.94 respectively. As most maternal mortality rates given are based on live births only, the rates used in the tables which follow are calculated on live births, and not total births.

LATE FOETAL AND INFANT MORTALITY.

A still-birth is usually defined as the birth of a viable foetus that is dead at birth. Certain countries include live born infants dying shortly after birth, e.g. "within 24 hours" or "before registration as a live birth", as still-births. (United Nations, 1953, p.20). In South Africa a foetus is regarded as viable if it has completed 6 months of intra-uterine life, and the infant is "still-born" if it is viable, but showed no signs of life after complete birth. (Gordon, Turner and Price, 1953, p. 226, footnote 6).

It is possible that a proportion of still-births escape registration. In Cape Town this omission has probably been commoner in the Non-European population, especially in the earlier years of the period under review.

Still-births are more correctly related to total births, i.e. the "still-birth rate" = $\frac{\text{Number of still-births in year}}{\text{Number of live and still-births in year}}$ x 1000.
In some areas the still-births are related to the number of live births. This index is called the "still-birth ratio". (United Nations, 1954, p.7), and is defined as $\frac{\text{Number of still-births in year}}{\text{Number of live births in year}}$ x 1000.

In the tables which follow, the average annual still-births are shown, and the still-birth rate has been calculated by relating this number to the average annual total births.

Neonatal deaths are defined by the Medical Officer of Health, Cape Town, as deaths of infants under 4 weeks of age. The neonatal death rate is the number of neonatal deaths per year per 1000 live births in the same year.

The infant mortality rate is defined as the number of deaths of infants under 1 year per annum per 1000 live births during the same year. In some countries, e.g. England and Wales, the infant deaths are related to the same babies to whom the rate refers. This allows for infants who do not reach the age of 1 year during the year under review, but unless the numbers of live births or infant deaths are changing rapidly the

correction is small.

Where births are incompletely, and deaths are fully registered, the infant mortality rate will be unduly high. This has probably occurred to some extent among the Non-Europeans, especially the Natives, in Cape Town, and the statistical effects will be discussed later.

MATERNAL MORTALITY TRENDS.

(a) MATERNAL MORTALITY IN CAPE TOWN.

A comparison of the maternal mortality rates of Europeans and Non-Europeans in Cape Town is shown in Table 48.

TABLE 48

MATERNAL MORTALITY RATES IN THE CITY OF CAPE TOWN
(AVERAGE ANNUAL PUERPERAL DEATHS PER 1,000 LIVE BIRTHS)

PERIOD Years ending June 30th	MATERNAL DEATHS		MATERNAL MORTALITY RATES FROM					
			Puer. Sepsis		Other causes		All causes	
	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.
1914 - 19	7	23	0.59	1.30	2.13	3.55	2.72	4.85
1919 - 24	21	25	1.76	1.20	2.84	2.16	4.60	3.36
1924 - 29	13	41	1.03	1.71	1.74	3.73	2.77	5.43
1929 - 34	35	99	0.94	1.27	3.04	3.12	3.98	4.40
1934 - 39	46	159	0.96	1.39	2.43	3.30	3.38	4.49
1939 - 44	32	155	0.85	1.79	1.09	2.50	1.93	4.29
1944 - 49	20	97	0.14	0.52	0.79	1.70	0.93	2.22
1949 - 54	10	77	0.12	0.36	0.46	1.16	0.58	1.52

Source: M.O.H., Cape Town, 1953-54, p.20.

From Table 48 it can be seen that among the Europeans and the Non-Europeans there has been a considerable fall in maternal mortality in recent years. The decline among the former became marked after 1934-39 and among the latter after 1939-44. Prior to these periods the average annual rates have generally been a good deal higher than those of the Europeans, the relationship was reversed in the period 1919-24. The average European maternal mortality rate for 1914-19 was surprisingly low. These unusual findings are probably due to the small numbers of deaths upon which the rates are based. Another possibility is that there was incomplete reporting of births in the earlier years, but it seems improbable that this should be more marked among the Europeans in one period and among the Non-Europeans in another.

It is of interest that between 1939-44 and 1944-49 there was a big decline in the rates from puerperal sepsis, whereas the decline in deaths from "other causes" (e.g. abortion, toxaemia, ectopic gestation,

haemorrhage, etc.) occurred five years earlier.

Taylor and Dauncey (1954) pointed out that the maternal mortality rate in England and Wales failed to decline with the general mortality rate until 1937 when the former rate began to diminish considerably. In that country puerperal infection began to decline as a cause of puerperal mortality from 1937, whereas the two other major groups of causes, toxaemia and haemorrhage, began to diminish in importance 3 to 5 years later. Taylor and Dauncey attributed the fall in puerperal sepsis mainly to the introduction of sulphonamides. The annual maternal mortality rates in Cape Town show that the rate from puerperal septicaemia began to decline after 1943-44 for both Europeans and Non-Europeans which reveals that there was a considerable time lag in the effective application of this new therapeutic measure.

Because of the irregularity of the rates in earlier quinquennia it is difficult to compare the European and Non-European improvements in maternal mortality. However, one can state that the European rate appears to have been reduced to a considerably greater degree than the Non-European.

(b) COMPARISON WITH OTHER POPULATIONS.

The trends of maternal mortality in Cape Town are compared with those in other areas, in Table 49.

TABLE 49

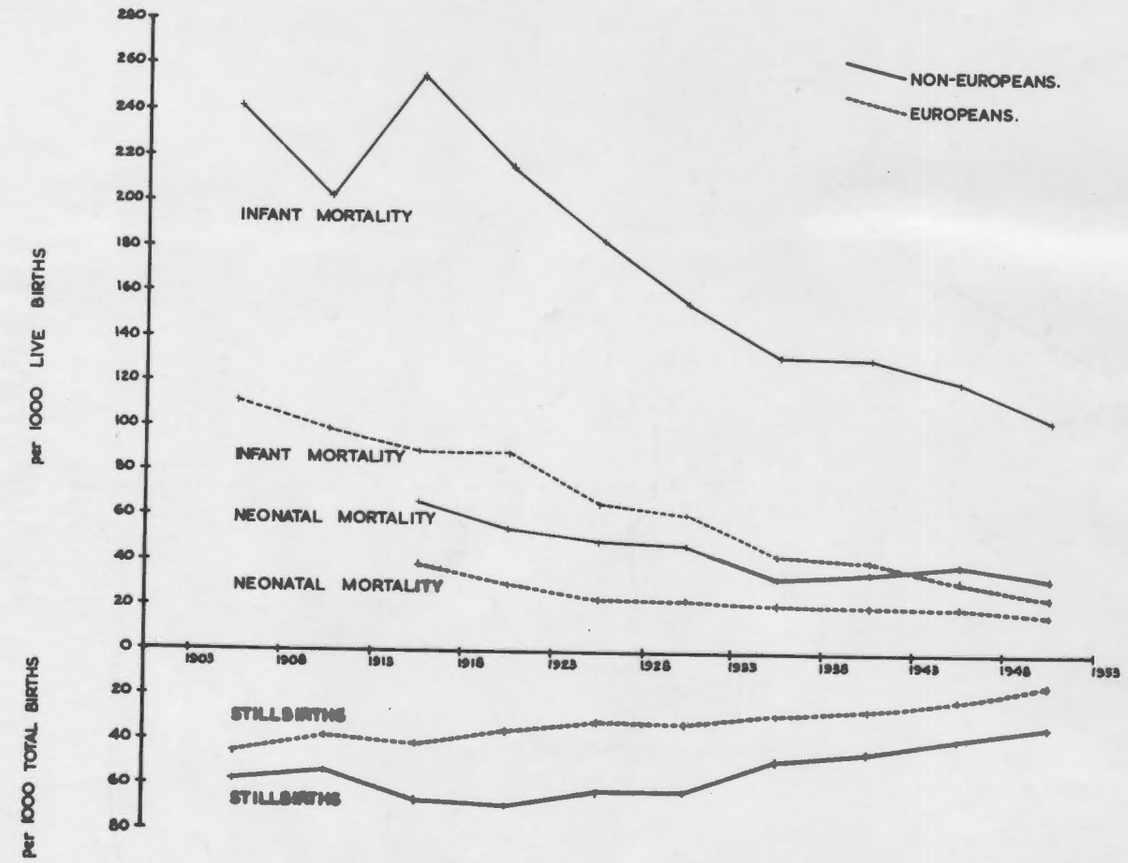
MATERNAL MORTALITY IN VARIOUS AREAS
(PUERPERAL DEATHS PER 1,000 LIVE BIRTHS)

PERIOD (approx)	CAPE TOWN (1)		SOUTH AFRICA (2)			ENGLAND & WALES (3)	LONDON (4)
	Eur.	N-Eur.	Eur.	Col	Asiatic		
1930-32	3.98	4.40	5.09	-	-	4.13	2.37
1950 (Averages)	0.44	1.43	1.0	2.6	2.6	0.84	0.46

Sources: (1) M.O.H., Cape Town, 1952-53. (Averages for 1928-29 to 1933-34 and 1948-49 to 1952-53).
(2) Union of South Africa, Official Yearbook No. 27, 1952-53. (Averages for years 1949-1952).
(3) Great Britain, Registrar-General, 1954.
(4) London County Council, 1952, p.140. (Averages for 1931-35 and 1949-51).

It will be seen that the rates for Cape Town (1948-49 to 1952-53) were considerably better than those of South Africa generally at approximately the same period. Unfortunately there are no available figures for maternal mortality among Natives in South Africa, but it is unlikely that the rates for Natives are lower than those for Coloureds and Asiatics.

CHART 8.



STILLBIRTH , NEONATAL MORTALITY and INFANT MORTALITY RATES .
FIVE YEARLY AVERAGES for EUROPEANS and NON-EUROPEANS.
CAPE TOWN 1903 - 1958

TABLE 50.

STILL-BIRTHS AND INFANT MORTALITY - CAPE TOWN, 1903 TO 1953.

(Annual Averages)

Period	Europeans					Non-Europeans				
	Still Births (Ave.)	Live Births (Total)	S.Birth Rate	Neonatal D.Rate	Infant M.R.	Still Births (Ave.)	Live Births (Total)	S.Birth Rate	Neonatal D.Rate	Infant M.R.
1902-03 to 1907-08	33.8	3640	44.7	+	110.7	84.4	6962	57.1	+	241.0
1908-09 to 1912-13	30.0	2801	38.0	+	97.6	94.6	8434	53.1	+	203.4
1913-14 to 1917-18 (a)	96.6	11382	41.5	39.0	89.4	244.8	16208	66.4	65.9	255.6
1917-18 to 1922-23	90.6	12148	35.9	29.9	89.5	294.0	19782	69.1	54.2	216.6
1923-24 to 1927-28	83.0	12992	31.0	24.0	67.4	326.0	24522	62.3	48.9	182.8
1928-29 to 1932-33	98.6	14342	32.9	24.8	60.6	408.0	30676	62.4	48.4	157.2
1933-34 to 1937-38	83.0	13477	29.9	23.2	43.8	348.2	33563	49.3	34.7	132.6
1937-38 to 1942-43	86.8	15600	27.1	21.7	41.0	332.4	35265	45.0	37.3	130.5
1943-44 to 1947-48	81.6	18666	21.4	20.8	33.8	334.6	41295	38.9	39.8	122.0
1948-49 to 1952-53 (b)	50.2	17445	14.2	16.6	26.6	344.0	49958	33.3	33.4	104.8
Reduction (a) to (b) Per Cent	-	-	65.8	57.4	70.2	-	-	49.8	49.3	59.0

+ Not available.

Source: Taken or computed from data in Annual Reports of M.O.H., Cape Town.

Compared with the rates for England and Wales, the Cape Town European figures are better, and the Non-European figures worse than those in that area. But the rates for London are better than those for Cape Town Europeans, despite the fact that all social classes are included in the former city, whereas the latter group generally enjoy more favourable social circumstances.

STILL-BIRTHS, AND NEONATAL AND INFANT MORTALITY.

The still-birth, neonatal and infant mortality rates for Europeans and Non-Europeans in Cape Town from 1903 to 1953 are summarised in Table 50 and Chart 8. These vital statistics show marked inter-racial differences, but unfortunately rates cannot be calculated in all cases for the three Non-European races separately.

STILL-BIRTH RATES.

(a) Cape Town data.

The still-birth rates of Europeans in Cape Town have consistently been lower than those of Non-Europeans. Like the Maternal Mortality rate, still-birth rates did not decline definitely till after 1928-33 from which time they followed the trends similar to those taken by general and infant mortality. Data for the four racial groups separately are available from 1947-48 onwards and comparisons between Coloured, Asiatic and Native still-birth rates are made in Table 51.

TABLE 51.

INTER-RACIAL COMPARISON OF NUMBERS OF STILL STILL-BIRTHS AND STILL-BIRTH RATES, CAPE TOWN 1947-48 TO 1952-53.

Year ended June 30th	EUROPEANS		NON-EUROPEANS		COLOUREDS		ASIATICS		NATIVES	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1948	71	18.2	331	35.7	249	30.7	13	41.4	69	80.8
1949	53	14.0	336	33.8	267	30.4	16	56.9	53	60.5
1950	56	16.0	341	33.7	266	30.4	4	12.3	71	68.4
1951	41	12.1	344	33.7	271	30.5	9	27.9	64	64.0
1952	42	12.2	329	31.3	255	28.1	12	31.8	62	57.9
1953	59	16.5	370	34.0	298	31.8	10	31.3	62	51.8
Average rate 1948-1953		14.8		33.7		30.4		33.6		63.9

These figures show that the Natives had still-birth rates which were on the average about twice as high as those of the other two Non-European groups. As there is probably considerable under-registration of births by Natives in Cape Town, it is likely that a part of the disparity in the rates is an artifact. It is interesting that here again the rates for the Coloured group and those for all Non-Europeans were not markedly different.

From Table 50 it was seen that both European and Non-European still-births declined considerably in the period under review. The European still-birth rate declined 65.8 per cent in the period between 1913-18 and 1948-53. The Non-European rates declined only 49.8 per cent in the same period, despite their higher initial rate.

Still-birth rates in 1953 for three maternity hospitals in Cape Town are available. Naturally, the admissions to these hospitals must have been highly selected, nevertheless the figures provide useful evidence of the inter-racial differences. The statistical reports for these hospitals for the year 1953 include the following data:

Hospital	Racial group	Total births in hospital	Still-birth rate
St. Monica's	Non-Europeans	1,106	32.5
P.M.H.	Mainly Non-Europeans	2,012	39.2
Mowbray M.H.	Europeans (lower income)	1,038	14.1

Source: University of Cape Town, Department of Obstetrics and Gynaecology. Undated.

(b) Comparison with other areas.

When the still-birth statistics of the City of Cape Town are compared with those of other areas for different periods it will be seen (Table 52) that Cape Town European rates compare favourably with those of other countries and with London, although they were higher than those for South African Europeans and the Netherlands in the 1930's. The rates for Non-Europeans, on the other hand, have been consistently worse than those for all the other areas selected.

TABLE 52

STILL-BIRTH RATES IN VARIOUS AREAS

PERIOD	CAPE TOWN (1)		S. AFRICA	ENGLAND	NETHER-	COUNTY OF
	Eur.	Non-E.	Eur.(+)(2)	& WALES(2)	LANDS (3)	LONDON (4)
1933-38	29.9	49.3			25.1	31.7
1936-38			23.7	40.6	25.6	
1938-43	27.1	45.0	21.9	35.9	22.3	28.5
1943-48	21.4	38.9	19.1	26.6	19.8	22.5
1949	14.0	33.8	17.7	23.2	19.3	19.7
1950	16.0	33.7	17.2	23.1	19.3	19.4
1951	12.1	33.7		23.6	18.2	20.1
1952	12.2	31.3		23.1	18.2	
1953	16.5	34.0			17.5	

(+) Still-birth "ratios" (which are slightly higher than still-birth "rates").

Source: (1) M.O.H., Cape Town.
(2) United Nations (1953), Table 8.
(3) De Haas (1955).
(4) London County Council (1952), p. 142.

INFANT MORTALITY RATES.

(a) Cape Town data.

The infant mortality rates of Europeans and Non-Europeans during the period 1903 to 1953 have already been shown in Table 50. The inter-racial rates since 1938 for the four main races are shown in Table 53.

TABLE 53.

INTER-RACIAL COMPARISON OF INFANT MORTALITY RATES
CAPE TOWN, 1938-1953.

(Numbers of infant deaths shown in brackets)

Year ended June	EUROPEANS	NON-EUROPEANS	COLOUREDS	ASIATICS	NATIVES
1938	41.0 (120)	128.9 (893)	127.3 (813)	46.6 (9)	233.3 (71)
1939	41.9 (121)	123.6 (862)	123.0 (786)	45.7 (10)	180.3 (66)
1940	40.8 (125)	123.9 (881)	122.6 (801)	33.9 (6)	185.9 (74)
1941	35.7 (108)	128.8 (929)	126.9 (840)	73.9 (15)	188.8 (74)
1942	43.8 (143)	150.6 (1052)	149.6 (949)	40.4 (8)	214.9 (95)
1943	42.5 (148)	125.8 (878)	120.4 (756)	50.9 (11)	229.3 (111)
1944	31.9 (125)	134.6 (1031)	127.7 (891)	78.6 (18)	268.7 (122)
1945	34.6 (125)	119.0 (923)	113.7 (781)	51.7 (12)	198.7 (130)
1946	36.8 (131)	102.8 (811)	95.9 (667)	58.3 (14)	188.1 (130)
1947	27.5 (110)	108.0 (977)	93.2 (759)	74.1 (14)	283.3 (204)
1948	37.1 (142)	122.2 (1093)	109.3 (859)	66.4 (20)	272.6 (214)
1949	29.3 (109)	110.9 (1065)	101.7 (866)	71.7 (19)	218.7 (180)
1950	29.6 (102)	101.5 (993)	92.3 (784)	31.1 (10)	205.8 (199)
1951	23.9 (80)	104.2 (1028)	91.3 (787)	57.3 (18)	238.2 (223)
1952	28.8 (98)	106.3 (1083)	91.3 (805)	49.3 (18)	257.7 (260)
1953	21.3 (75)	101.3 (1065)	90.2 (818)	35.6 (11)	207.9 (236)

Averages:	Eur.	Non-E.	Col.	Asiat.	Natives.
(a) 1938-41	39.8	126.3	124.9	50.0	197.1
1942-45	38.2	135.0	127.8	55.4	227.9
1946-49	32.7	111.0	100.0	67.6	240.7
(b) 1950-53	25.9	103.3	91.3	43.3	227.4
Per cent reduction (a) to (b)	34.9	18.2	26.9	13.4	-15.4

Source: M.O.H., Cape Town Annual Reports. (All deaths and rates are corrected for outward transfers).

These figures show that Non-European infant mortality rates have been consistently higher than those of Europeans, but both have dropped considerably in the past fifty years.

When the annual rates for the two groups are examined (Appendix E) it can be seen that there was greater fluctuation in the Non-European infant mortality rates. This conforms with the finding

of Woolf and Waterhouse (1945) that in communities with high rates the variability is greater than in those with low rates. This high variability suggests that adverse conditions like epidemics, etc., are less well tolerated in these latter communities. The enormous peak in the year of the influenza epidemic (1918-19) in the Non-European curve as compared with the much smaller European peak is one evidence of this.

The comparative reductions in infant mortality rates between the quinquennium 1913-18 (the first after "unification" of the City in September, 1913) and the quinquennium 1948-53 is interesting. Whereas the absolute decrease for Europeans was 52.8 and for Non-Europeans 140.8 per 1,000 live births, the proportional decreases were 70.2 and 59.0 per cent respectively. In other words, European infant mortality, despite its lower level, has decreased relatively more rapidly.

Part of the explanation for this may lie in the fact that in recent years, especially since the beginning of World War II larger numbers of Natives were born in Cape Town. Native conditions of life are generally worse than those of Coloured people and consequently the infant mortality rates for all Non-Europeans are elevated by the increasing numbers of Native babies born in the city. This is confirmed by the infant mortality rates for the four racial groups shown in Table 53.

However, even when the Coloured infant mortality rates are separated from the other Non-European groups, the proportional reduction from 1938-41 to 1950-53 is greater among the Europeans than among the Coloured population. Among the Natives there was an actual rise in mortality in this 15-year period, but it is impossible to know how much of this was due to differences in completeness of registration, to chance fluctuations, or to other causes.

It is interesting that the infant mortality rate for Non-Europeans in 1948-49 was the same as that for Europeans in the first decennium of the century.

(b) Comparison with other areas.

The average infant mortality rate for Europeans in Cape Town in 1901-05 was 136 per 1,000 live births and that for Non-Europeans 261. At the same period the rates for London and for England and Wales were 139 and 138 respectively, while that for the Netherlands was 136.

In 1900 the rate for New York City was 200. The Cape Town rate at the beginning of the century thus compared favourably with those of advanced communities elsewhere at that time.

The infant mortality rates in various areas during the last 30 years are shown in Table 54.

TABLE 54

INFANT MORTALITY RATES IN VARIOUS AREAS 1921 - 1953.

Period	Cape Town Eur. (1)	S.Africa Eur. (2)	England & Wales (2)	County of London (3)	Oslo (4)	Netherlands urban areas (5) +
1921-25	72	73	76	71		
1926-30	63	67	68	64		
1931-35	50	63	62	63	37	34
1936-38	44	56	56	61	32	
1939	42	49	51	46	30	29
1940	41	50	57	45	33	
1941	36	51	60	46	33	
1942	44	48	50	50	27	33
1943	42	47	49	51	29	
1944	32	43	45	50	32	
1945	35	40	47	44	20	
1946	37	36	41	38	21	32
1947	27	34	41	34		30
1948	37	36	34	31		26
1949	29	38	32	27		23
1950	30	36	30	26		24
1951	24	33	30	25		24
1952	29	33(1)	28(1)	23(1)		21
1953	21	25(1)	27(1)	24(1)		19

Sources: (1) M.O.H., Cape Town.
(2) United Nations (1953)
(3) London County Council (1952).
(4) World Health Organisation (1951).
(5) Posthuma (1955). (+)(Municipalities with over 100,000 inhabitants).

The Cape European rates have generally been lower than those for Europeans in South Africa and for England and Wales, and higher than those for Oslo and urban areas of the Netherlands.

NEONATAL MORTALITY.

Statistical study of mortality in infancy has revealed the fact that neonatal deaths (i.e. those in the first four weeks or month of life) appear to be less easily prevented than those which occur in the remaining 11 months of the first year. Increasing attention is therefore being paid to the problems of the neonatal period.

(a) Cape Town data.

Neonatal mortality rates of Europeans since 1913-18 have always been lower than those of Non-Europeans in Cape Town. (Table 50).

In both groups there has been a considerable decline from 1913-18 to 1948-53, but the European rates have been reduced 57.4 per cent as compared with a Non—European reduction of 49.8 per cent in the 35 year period.

From Chart 8 and Table 50 it is apparent that neonatal mortality has decreased proportionately less than has infant mortality. As infant mortality as a whole decreased, deaths in the first month of life became relatively more important. The proportion of infant deaths which occurred in the first four weeks of life, i.e. neonatal as a percentage of infant mortality, is shown in Table 55.

TABLE 55

RATIO OF NEONATAL TO TOTAL INFANT DEATHS - CAPE TOWN 1913 TO 1953. (PERCENTAGES)

Period	European	Non-European
1913-18	43.6	25.8
1918-23	33.4	25.0
1923-28	35.6	26.8
1928-33	40.9	30.8
1933-38	53.0	26.2
1938-43	52.9	28.6
1943-48	61.5	32.6
1948-53	62.4	31.9

This proportion has increased more rapidly among the Europeans than among the Non-Europeans even though since 1913-18 it has always been lower in the Non-European group. It can be seen that in 1948-53 only 37.6 per cent of European infant deaths occurred in the post-neonatal period (over 4 weeks but under 1 year of age) whereas 68.1 per cent of Non-European infant deaths occurred in that period. It is in this post-neonatal period that the infant's life depends so much on external environment and that mortality has been so greatly reduced. It is evident that the improvement in general conditions has been less among the Non-Europeans than among the Europeans.

A comparison between neonatal mortality rates in Cape Town and in other areas is shown in Table 56.

TABLE 56

NEO-NATAL MORTALITY RATES IN VARIOUS AREAS 1931 TO 1955

PERIOD	CAPE TOWN Eur. (1)	CAPE TOWN Non-E. (1)	S. AFRICA Eur. (2)	ENGLAND & WALES (3)	LONDON (3)	NETHERLANDS (4)
1931-35			24.8	31.4	25.1	22.6
1933-38	23.2	34.7				
1936-40			23.7	29.0	22.9	20.8
1939	22.8	39.0	23.5	28.3		19.7
1940	21.5	34.7	22.0	29.7		21.4
1941	19.4	37.2	23.1	28.9		22.7
1942	23.1	39.9	22.4	27.1		21.0
1943	21.4	36.0	21.5	25.2	23.4	20.5
1944	17.0	38.0	20.8	24.2		23.1
1945	20.6	37.8	20.6	24.9		29.7
1946	23.6	38.9	21.0	24.2	22.2	20.9
1947	18.9	41.4		22.7	18.1	18.3
1948	24.3	40.4		19.8	17.5	17.4
1949	18.0	37.3		19.3	17.5	16.7
1950	14.5	33.5		18.5	16.9	16.2
1951	16.1	30.6		18.9	17.3	16.7
1952	19.7	32.7				14.9
1953	14.5	32.9				14.8

Sources: (1) M.O.H., Cape Town.
(2) World Health Organisation (1951). Table 6.
(3) London County Council (1952), p. 13.
(4) De Haas (1955).

As in the case of other mortality rates already quoted, the neonatal death rates for Europeans in Cape Town compare favourably with those of other countries with low rates. The Cape Town Non-European rates compare unfavourably.

The European Cape Town rates and trends are very similar to those of London and the Netherlands, and are better on the whole than those for South African Europeans and for England and Wales.

Baumgartner (1953) showed that in the United States post-neonatal mortality dropped 80 per cent and neonatal mortality only 52 per cent, between 1915 and 1949. Among the European population of Cape Town the post-neonatal mortality rate declined from 50.4 to 10.0 and the neonatal from 39.0 to 16.6 per 1,000 live births in approximately the same period. These represent reductions of 80 and 57 per cent respectively - figures which correspond very closely with the American ones.

DISCUSSION.

Factors affecting maternal and infant mortality.

There is a very extensive and rapidly growing literature on the subject of maternal and infant mortality. Only work concerning the underlying biological and social factors will be briefly reviewed here.

It must be stressed, however, that biological and social factors are closely connected, one often acting through the other. The age and parity of the mother and the size of her family, for instance, are determined to a very considerable extent by social and economic factors. Overcrowding, nutrition, and the quantity and quality of maternal care, on the other hand, are closely linked with size of family. It is therefore impossible to separate biological from social influences to any great extent, but for practical purposes it is convenient to describe such influences as age and parity of the mother, the incidence of premature and multiple births, and the possibility of genetic differences between "racial" groups as biological factors, even though we know that some of these factors are largely activated by social conditions.

The investigation of the relationship of social factors to health is extremely complex. The collection and measurement of social data is often fraught with difficulties because of the problems arising from lack of standardised methods and the frequent necessity of having to rely upon subjective statements. In addition, almost every social index such as housing, diet, educational standard, social class, etc., is a measure of a number of associated conditions which can be separated only with great difficulty, if at all.

In general it is probably true to say that the biological factors are the more important in causing foetal and neonatal deaths, while the social factors are more influential in determining post-neonatal mortality. However, it is not impossible that many conditions now thought to be due to biological or genetic factors will be found to be greatly affected by environmental influences.

BIOLOGICAL FACTORS.

1. RACE.

There is little, if any, evidence that racial factors *per se* exercise any measurable influence over the reproductive capacity of

women or the ability to survive of their children. Any ethnic differences which do exist as a consequence of genetic variations must be so modified or masked by cultural social or economic circumstances that they become of much less importance.

In South Africa, Heyns (1946), on the basis of the comparative ease with which Bantu women gave birth despite relatively small pelves, concluded that the South African Native as a parturient was greatly superior to the white woman. He suggested that the difference lay in the powers (uterine and other muscular action) which are used to the full in the Native but suffer a partial inhibition in the white woman. (Without further investigation it would be impossible to say whether this were due to racial or acquired characteristics).

Apart from this observation on the superiority of South African Native women, no other statement could be found to suggest any racial differences between Europeans and Non-Europeans which would influence maternal and infant mortality.

2. AGE AND PARITY OF MOTHER.

(a) Maternal mortality.

Age and parity of mother are naturally closely related to each other, since women of high parities are more likely to be older than women of low parities.

According to a report on an investigation into maternal mortality (Great Britain, Ministry of Health, 1937, p.279) the risk of maternal death in Britain increased steadily with advancing age. The risk at the first was apparently greater than at succeeding confinements until about the eighth and those subsequent to the eighth; the third confinement appeared to carry the least risk. The average risk of confinement at the first pregnancy was 25 per cent in excess of the general risk for all pregnancies. After the eighth pregnancy the risks became even greater than for first confinements.

This investigation showed too that the falling fertility for England as a whole had hardly affected the puerperal mortality rate because the effects of the increase in the proportion of primiparae was offset by a greater relative decrease in confinements of high parity.

The high fertility in Cape Town of Coloured women aged 15 to

44 as compared with European women (see Table 29) indicates that there would be (1) relatively fewer primiparous births, and (2) relatively more births of high parities among Coloured women. These two factors worked in opposite directions in Britain, and it seems reasonable that we can presume that the one went far towards neutralising the other in Cape Town too.

In Cape Town there are unfortunately no statistics concerning ages of mothers in relation to maternal mortality.

(b) Foetal and infant mortality.

The association between age and parity of the mother and still-birth, neonatal death and post-neonatal death rates have been studied by a number of workers. Yerushalmy (1938), Baird (1945), Burns (1942), Sutherland (1949), Registrar-General of England and Wales (Great Britain, 1954) and Heady et al (1955) have generally found similar variations, viz.:

(i) Still-births tended to increase with mother's age.

(ii) Still-births were high in first births for each age group. The rate was low for second infants, and it steadily rose with increasing parity.

(iii) Neonatal death rates tended to follow the same trends as still-birth rates in relation to mother's age and parity, although the variations were less marked in the former.

(iv) Post-neonatal deaths rose steadily with mother's parity. (This was mainly due to higher mortality from infections and will be discussed under the heading of "Size of family and mortality").

(v) Post-neonatal deaths were lower with older mothers as compared with younger ones.

Without the necessary data on age and parity of European and Non- European mothers in Cape Town it is impossible to say what the ultimate effects of these biological factors have been on foetal and infant mortality in this population. Because of the higher fertility rates among Non-Europeans (Table 29) it can be said with a considerable degree of confidence that the disadvantages associated with higher parities operate more frequently among that group. This would reveal itself in the still-birth rate and especially in the post-neonatal death

rate - both of which are higher among the Non-Europeans than among the Europeans.

The Asiatic group in Cape Town, however, has the highest fertility rates, but its infant mortality rate is considerably lower than that of the Coloured or the Native group and it is likely that social factors play a bigger part in producing these differences in infant mortality than do biological factors.

3. RAPIDITY OF BREEDING.

A small number of investigators have attempted to assess the effect of the shortness of the intervalbetween births on the viability of infants.

The results of studies reported by Woodbury in 1925, Rochester in 1923, Burns in 1942 and Yerushalmy in 1945 (United Nations, 1954, p.9) indicated that the interval of two to four years between successive births usually resulted in optimum survival rates.

Sutherland's (1949) figures showed that among young mothers who had unusually large families for their age the still-birth rate tended to be excessive.

Heady et al (1955), in an analysis of 691,640 single legitimate births in England and Wales in 1949, showed that young women who had high parities (i.e. who bred rapidly) tended to have infants with high neonatal and post-neonatal death rates.

On the other hand Eastman (1944) in a careful study of 5,158 women (2,151 white and 2,262 coloured "ward" patients, and 745 "private" patients) found that infants born 12 to 24 months after a previous viable delivery had at least as low a still-birth and a neonatal mortality rate as did infants born after longer intervals. Moreover, the longer the interval between births, the more likely the mother was to develop some form of complication. The incidence of toxaemia of pregnancy was lowest when the interval was 12 to 24 months, and significantly higher when the interval was longer. This was true of white and coloured ward patients and of private patients. When the interval between births was 12 to 24 months the incidence of the following conditions was no greater than when it was longer: premature labour, anaemia, post-partum harmorrhage and puerperal infection. He concluded that the youth of the

mother was more important than the intervals between her pregnancies.

However, in these studies on the effect of rapidity of breeding, no allowance was made for social influences (including the standard of medical care) which were likely to affect foetal and infant life, simultaneously with diminishing intervals between births. In other words, it is possible that poorer survival rates among children in families with small intervals between births, may be due just as much to social as to biological influences. It is possible that short intervals between births under good social circumstances does no harm to mother or infant.

Because of the high fertility rates among Non-European women in Cape Town one can assume that rapid breeders are more common among them than among European women. It is possible that this is also a factor predisposing Non-European infants to higher mortality rates even though the evidence of studies in other communities is somewhat conflicting.

4. MULTIPLE BIRTHS.

In an investigation into 1,436 maternal deaths in England and Wales (Great Britain, Ministry of Health, 1937, p. 110) it was found that one out of 19 maternal deaths accompanied a twin birth. The proportion of twin to total confinements was about one in 90. It was concluded that twin pregnancy enhanced the average maternal mortality risk considerably.

In a review of a number of studies on the effect of multiple births on the vitality of infants it was concluded that the still-birth ratio was generally twice as high for multiple births as for single births. Neonatal mortality among infants born in plural births was several times higher than that of single births. Similar, although less pronounced differentials in infant mortality left no doubt that the "biological abnormality" of plural birth substantially decreased the chances of survival of foetuses during at least the latter part of pregnancy and of infants after they had been born. (United Nations, 1954, p. 10). It is known that certain ethnic groups have a higher incidence of multiple births than do others. According to a report of the United Nations Department of Social Affairs (ibid. Table 11), the

incidence in 18 countries varied from 1.1 to 1.8 per cent of all births. In an analysis of all the births which were registered in Durban in 1948, Salber (1955a) found that the incidences of multiple births among the 3,277 European, 6,510 African (Natives), 674 Coloured and 5,217 Indian births were 1.2, 2.2, 1.5 and 1.0 per cent respectively. Ross (1952) reported the occurrence of 100 pairs of twins in 3,464 births in Southern Rhodesian hospitals - an incidence of 2.9 per cent.

It is therefore possible that in Cape Town Non-Europeans have a higher incidence of multiple births than Europeans and that this may play a part in increasing the number of maternal and infant deaths. By no stretch of the imagination, however, could this factor be considered to be a major influence in producing the large inter-racial differences in maternal and infant mortality seen in Cape Town. There is nevertheless a need for investigation of this as well as other basic biological factors in the rapidly changing multi-racial society.

5. PREMATURITY.

By definition a premature or immature infant is a liveborn infant with a birth weight of 5½ pounds (2,500 grm.) or less. If the weight is not specified, a liveborn infant with a gestation period of less than 37 weeks is considered to be premature or immature. (World Health Organisation, 1948, p. 212).

As pointed out by Taback (1951) the use of birth weight as a basis for definition of prematurity is unsatisfactory, as it does not allow for any possible racial differences. (Nor does such a definition allow for the sex differences in birth weight or for any genetic variations in body size within racial groups).

Accurate assessments of the proportion of all births which are premature are difficult to secure because data are obtainable generally only from hospitals or other institutions where an unusually large proportion of premature infants are likely to be born.

The incidence of prematurity varies considerably in different populations. Yerushalmy (1938) found 5.5 per cent of all births in 1936 in New York State (excluding New York City) to be premature, while Crosse (1946) reported the incidence in Birmingham in 1944 to be

6.3 per cent. The Joint Committee in their national survey of maternity in Great Britain (1948) found an incidence of 6.4 per cent.

Baumgartner et al (1950) reported that in 1939 and 1940 in the City of New York 7.3 per cent of white and 12.4 per cent of non-white babies were premature.

In South Africa racial differences in the incidence of prematurity have also been reported.

Salber and Bradshaw (1953) in a study of birth weights of South African babies found the incidences of prematurity among the four racial groups to be:-

	Incidence of prematurity
European	4.2 per cent
Coloured	9.6 per cent
Bantu	11.5 per cent
Indian	18.3 per cent.

Their data were derived from hospital statistics, and it was likely that Non-European admissions would be more highly selected for abnormalities than those of Europeans, for whom access to maternity hospitals was easier. It is highly probable, however, that European babies in South Africa generally, have a lower incidence of prematurity than do babies of the Non-European groups and there is no reason to believe that this does not apply in Cape Town too. Support for this assumption is provided by the average birth weights of babies delivered in Cape Town by hospital staffs in 1933 to 1936.

The average birth weights were as follows:-

	IN-PATIENTS		HOME CONFINEMENTS	
	Number of births	Average birth wgt.	Number of births	Average birth wgt.
		lbs.		lbs.
Non-Europeans (mainly Coloured)	1, 763	7.01	906	7.31
Europeans	906	7.42	187	7.61

Source: U.G. 54/1937, p. 88-89.

Immature or prematurely born infants are exposed to greater risks of death before, during, or after birth than are infants who are mature or of normal weight. For example, McNeil (1942) found a still-

birth rate of 322 per 1,000 total births and a neonatal death rate of 211 in a series of 653 viable premature babies in the Edinburgh Royal Infirmary. During the same period the corresponding rates were 44 still-births and 29 neonatal deaths per 1,000 mature births. Similarly in Birmingham, although the incidence of premature birth was only 6.3 per cent, yet 44.2 per cent of the still-births and 57.3 per cent of the neonatal deaths occurred in association with these premature births. Douglas (1950) reported that in a national survey in Great Britain in 1946, premature infants contributed 52 per cent of all neonatal deaths.

In the aetiology of prematurity several factors, both biological and social, have been found to play a part.

Yerushalmy (1938) and Martin (1954) reported that prematurity was more common where mother's age was below 20 or over 30. Premature births were more frequent in multiple pregnancies. (Yerushalmy, 1938; Baird, 1945; Crosse, 1945) and in first births (Anderson and Lyon, 1939). Douglas (1950) and Anderson and Lyon (1939) both remarked on the high incidence of prematurity in multiparae with closely spaced pregnancies.

Maternal ill-health, especially toxaemia of pregnancy, is a common cause of premature birth. Baird (1945 a) showed that the association of toxaemia with prematurity was twice as common in the poor as in the well-to-do.

Illegitimacy was associated with a high incidence of prematurity (Yerushalmy, 1938).

Baird (1945 a) found the prematurity rate and the mortality rate for premature infants higher among the lower social classes. In a later paper (1952) he showed that prematurity rates were higher in women who were of shorter stature and who were of poor physical health. He found that these two characteristics were commoner among poorer class women.

Martin (1954) also found a higher incidence of prematurity among the wives of semi-skilled and unskilled manual labourers.

The association between defective diets and the frequency of premature births has been reported by a number of investigators, but this factor will be discussed more fully in another section of this

chapter.

The position with regard to prematurity is well summed up by the report of the Joint Committee of the Royal College of Obstetricians and Gynaecologists and the British Paediatric Association (Great Britain, 1949, p. 51) in the following remarks: "Measures to reduce the frequency of premature labours are of the utmost importance, but the prospects of successful prophylaxis are naturally dependent upon the aetiology of each case, and it must be realised, as previously stated, that the cause remains unknown in about 40 per cent to 50 per cent of all cases - even when the mothers have received antenatal care at clinics staffed by obstetricians. There is, however, some reason to believe that these unknown causes will become fewer as preventive treatment of a general character is extended - e.g. improvement in economic, social and educational status of the poorer classes".

In the chapter which follows it will be shown that in 1948 to 1953 the Non-European infant mortality rate for prematurity was twice as high as the European rate.

The above evidence from both South African and other sources makes it evident that the incidence of prematurity is higher among Non-European infants and that much of the disparity between the races is due to adverse social conditions and is preventable.

6. OTHER BIOLOGICAL FACTORS.

Another aspect of child health and survival is the variation in lactational ability in different racial groups in South Africa. If ability to breast feed infants successfully is an index of natural efficiency in child bearing and rearing, then the Bantu and Coloured mothers of South Africa are superior to European mothers because Salber (1955 b) found that 93.4 per cent of European, 97.9 per cent of Coloured and 98.6 per cent of Native mothers in Durban successfully breast fed their babies on discharge from hospital. If average birth weight of infants is taken as an index of natural ability to survive, then Europeans in South Africa are superior to Coloured and Native (Bantu) and they to Indian babies. (Salber and Bradshaw, 1953). If growth in weight in the early months of life is used as such an index, then the Native (Bantu) babies are superior to the other groups because of their

more rapid gains in weight in the early months of life as compared with other South African babies (Salber, 1955 b).

Nevertheless, the infant mortality rates of these three racial groups in 1950-53 were 25.9, 91.3, and 207.9 per 1,000 live births in Cape Town for Europeans, Coloureds, and Natives respectively.

It is obvious from all these data that there is little or no evidence of a biological superiority for one or other racial group in South Africa which could account to any appreciable degree for the large racial differences in mortality rates in Cape Town.

The large reductions in general and infant mortality rates in Cape Town in the space of one generation make it far more likely that improvements in life expectation are due to various environmental changes in the lives of both Europeans and Non-Europeans. The poorer health of the latter group are reflections very largely of inferior social conditions and their slower rate of improvement in health is most likely due to relatively slower betterment of social environment among them.

SOCIAL FACTORS.

1. URBAN - RURAL DIFFERENCES IN MATERNAL AND INFANT MORTALITY RATES.

It has already been noted that the Cape Town maternal mortality rates are better than those of corresponding racial groups in South Africa as a whole. The latter groups include a considerable proportion of women living in rural areas.

The Registrar-General (Great Britain, 1954, Table 35) reported that in 1950 the maternal mortality rates of married women per 1,000 total legitimate live and still-births in England and Wales were:

Conurbations	0.70
Urban areas outside Conurbations	0.90
Rural areas outside Conurbations	0.92

These figures agree with the finding of the Investigation into Maternal Mortality (Great Britain, Ministry of Health, 1937, p.63) which concluded that there was not sufficient reason to believe that overcrowding tended to have an adverse influence on the puerperal mortality rate. It is probable that the availability of skilled nursing

and medical services plays a major part in determining the differences between the rates in various areas.

In several countries the records show that infant mortality rates used to be higher in cities than in rural areas, but with improvement in urban conditions city rates are now lower than rural rates. For instance, in Sweden in 1841-50 the ratio of urban to rural infant mortality rates was 1.51; in 1946-50 the ratio was 0.89. Similarly in the United States the urban - rural ratio for infant mortality in 1915-19 for all races was 1.10, whereas in 1945-49 it was 0.91 (United Nations, 1954, p. 13-14).

Sadie (1951) gave the following figures for the probability of dying in 1945-47 for European South African infants in urban and in rural areas:-

	MALES		FEMALES	
	Urban	Rural	Urban	Rural
During 1st month	.0249	,0194	,0197	,0133
During 1-2 months	.0179	.0180	.0149	.0146
Total mortality in infancy	.0428	.0374	.0346	.0279

It will be seen that the urban neonatal chances of mortality were considerably higher than the rural, but in the post-neonatal period the differences were slight. It will be seen also that in the period 1945-47 in South Africa Europeans living in rural areas still had infant mortality rates which were lower than those of Europeans living in urban areas. (Table 57).

Sadie concludes that "the neonatal mortality rate, i.e. the probability of dying during the first month of life, being chiefly a function of the state of the mother's health during the pre-natal period, shows that rural children are being born of biologically superior mothers. After the first month or two the conditioning environment becomes of more importance and favours the survival of the urban child whose life can be more easily prolonged because of better medical facilities".

It should be noted, however, that in South Africa "urban areas" are not defined by size of population, but by the existence or

absence of an urban local authority. Comparison with urban - rural differential trends in other countries is therefore not possible. It should also be remembered that Europeans in South Africa represent on the whole the economically better-off section of their communities. Unfortunately statistics for Non-European urban - rural differentials in infant mortality are not available.

On the whole it can be seen that European infants in Cape Town have at least as good a chance of survival in recent years as infants living in rural areas. As in so many social factors, it is impossible to separate the various components such as income, housing, educational standards, availability of medical services, etc., which may play a causal part in producing differences in urban and rural infant mortality rates.

TABLE 57

INFANT MORTALITY RATES IN URBAN AND RURAL AREAS FOR EUROPEANS IN SOUTH AFRICA.

Period	South Africa (1)	Urban Areas (1)	Rural Areas (1)	Cape Town (2)
1946	35.9	36.8	33.6	36.8
1947	34.4	36.4	29.0	27.5
1948	36.0	36.2	35.5	37.1
1949	38.5	39.8	34.8	29.3
1950	35.7	37.3	31.1	29.6
1951	33.5	34.5	30.8	23.9
1952	32.8	34.3	28.3	28.8
1953	34.1			21.3

Source: (1) Union of South Africa, Official Yearbook, 1952-53, p. 1133
(2) M.O.H., Cape Town.

2. SOCIAL CLASS AND SOCIO-ECONOMIC CONDITIONS.

"Social classes" in England and Wales and in the Netherlands are based upon the occupation of the head of the family. Many vital statistics in England and Wales are related to the five social classes defined by the Registrar-General.

Apart from differences in social status, these social classes imply differences in income, educational standards and tradition. Associated with these basic differences are the secondary effects of social class upon housing, nutrition, use of health services, occupation of mothers, etc., all of which determine the way of life of the members of the various classes. Social class differences, therefore, are the resultant of numerous inter-acting and inter-dependent social factors.

The maternal mortality rates in England and Wales in 1930-32 and 1950 by the Registrar-General's social classes are shown in Table 58.

TABLE 58

DEATHS OF MARRIED WOMEN PER 1,000 LEGITIMATE LIVE BIRTHS FROM ALL MATERNAL CAUSES. ENGLAND AND WALES.

	SOCIAL CLASS					ALL CLASSES
	I	II	III	IV	V	
1930-2	4.01	4.52	4.11	4.17	3.89	4.13
1950	0.80	0.93	0.78	0.86	0.99	0.84
Reduction per cent	80	79	81	79	75	80

Source: Great Britain, Registrar-General, 1954, Table 33.

It can be seen that in 1930-32 there was no definite social gradient in maternal mortality rates for legitimate births. The Report on an investigation into Maternal Mortality (Great Britain, Ministry of Health, 1937) suggested that the reason for this was the greater fall in fertility in the higher classes with a consequently greater proportion of first births in social classes I and II. As previously noted, it was found that the average risk to mothers at first pregnancy was about 25 per cent in excess of the general risk of all confinements and it exceeded the risk for subsequent pregnancies up to about the eighth, after which the risks became greater than that of a first confinement. It followed that social classes with low fertility rates would be at a disadvantage which to some extent would be offset by the greater number of births of high order in classes with high fertility rates.

In 1950 the social gradient in England and Wales was only slightly more definite than in 1930-32, and all social classes improved by about the same amount.

Compared with the maternal mortality rates of England and Wales by social classes in 1950 it will be seen that the Cape Town Europeans have a rate considerably better than that of Social Class I, and the Non-Europeans, on the other hand, have a rate considerably worse than Social Class V.

Sydenstricker (1933) showed how infant mortality rates in the United States declined as the earnings of the father increased. Investigations in Britain have revealed similar correlations between socio-economic class and infant mortality rates (Grundy, 1949; Douglas, 1951).

The Social Class variations in foetal and infant mortality rates are more definite than those for maternal mortality in England and Wales. (Table 59).

TABLE 59

FOETAL AND INFANT MORTALITY - ENGLAND AND WALES - 1950, AND CAPE TOWN - 1948-1953

	ENGLAND & WALES - SOCIAL CLASSES+					ALL CLASSES	CAPE TOWN	
	I	II	III	IV	V		Eur.	Non-E.
Still-birth	16.6	19.4	21.9	24.2	26.0	22.2	14.2	33.3
Neonatal mortality	12.9	16.4	17.9	20.5	22.2	18.5	16.6	33.4
Post-neonatal mortality	5.0	6.1	10.6	14.0	18.9	11.3	10.0	71.4
Total infant mortality	17.9	22.5	28.4	34.5	41.1	29.9	26.6	104.8

Source: (+) Great Britain, Registrar-General, (1954, Table 14 and 24).

The figures show that in England and Wales in 1950 there was a definite social gradient in foetal and infant mortality. Still-birth, neonatal, post-neonatal and total infant mortality rates rose steadily from Social Class I to Social Class V.

On the whole the rates for Cape Town Europeans correspond fairly closely with those of Social Class III (skilled workers, e.g. artisans, clerks, etc.) in England and Wales. The outstanding differences between the two sets of rates was the still-birth rate in Cape Town which was only two-thirds of the corresponding rate for Social Class III, and was lower even than the rate for Social Class I. When the rates for Cape Town Europeans are compared with those for social classes in conurbations, or with smaller urban areas, the same correspondence with the rates of Social Class III occurs, and the still-birth rate in England and Wales remains considerably higher.

Sutherland (1949) found that the still-birth rate in the county boroughs was associated with unemployment and poorly paid work. During the war, although in many respects the environment of the pregnant woman deteriorated, there was not only a fairer distribution of food, with priorities for expectant mothers, but there were also increased earnings with which to purchase food. Sutherland considered that this was the main reason for the continued decline in the still-birth rate in England and Wales during the war.

De Woolf and Meerdink (1953) give the following rates for infant mortality and still-births in Amsterdam for 1946-1950 by social groups:-

Social Group	Infant mortality rate	Still-birth rate
I	17.1	12.2
II	32.3	25.2
III	22.6	14.8
IV	31.3	18.6

The four groups are based on father's occupation thus:-

I e.g. liberal professions, managers of large or medium sized enterprises, teachers, etc.

II e.g. shop-keepers, artisans.

III e.g. lower officials, foremen, clerks, etc.

IV e.g. manual workers.

They suggest that the high mortality in group II is due to their lower educational level and the probability that many of the wives in this group assist their husbands at work or in business.

It is interesting to see that here again the Cape Town European still-birth rate of 14.2 per 1,000 births compares very favourably with the Amsterdam rates, being higher only than that of group I.

It may well be that this comparatively low still-birth rate for Cape Town Europeans can be explained on the differences in their ages and parities as compared with those of England and Wales and in Amsterdam, since still-births are more prevalent in older women and in primiparae and in women of high parities. On the other hand, there may be differences in the physique of Cape Town European women or even possibly in the standards of medical care which would account for the differences.

This low still-birth rate in Cape Town is worthy of further investigation.

Rate of reduction in infant mortality in relation to social class. Several authors have commented with surprise on the fact that despite the great improvement in the infant mortality rates the social class differences persisted in England and Wales between 1911 and 1950. (Logan, 1954; Morris and Heady, 1955).

This unexpected result was not easy to explain. Morris and Heady (1955) suggested that the possibility that this lag on the part of the infant mortality rate of the working classes might have been due to a delay in the development of wiser spending habits despite the improvement of economic conditions. "There may be a lag also in the knowledge of, use by, or availability to families in the classes IV and V of new scientific advances, of services, and of facilities, compared with classes I and II". Again slowly changing factors such as housing and education might have been the cause of delay in improvement. And finally it was possible that the effects of the mother's early childhood persisted and affected the health of her off-spring.

It was seen in Tables 50 and 53 that there was no closing of the gap between European and Non-European infant mortality rates; in fact, the disparity increased considerably. It is likely that some or all of these factors mentioned above operated in the population of Cape Town as well. But it is probable that, in addition, a part of the lag in the improvement in the Non-European rates was due to the greater disparity between the social, cultural and economic conditions between the races, especially when the factor of rural - urban migration is considered.

3. HOUSING.

Among the adverse effects of poor housing must be included such aspects as defective ventilation, bad sanitation, impure water supplies and over-crowding. It is almost impossible to separate these aspects of poor housing from the other components of the poverty complex such as under-nutrition, ignorance, lack of suitable medical and nursing facilities, etc.

From an investigation into maternal mortality some twenty

years ago (Great Britain, Ministry of Health, 1937) it did not appear that over-crowding was associated with unusually high maternal death rates in England and Wales.

In the Report on Maternity in Great Britain (Joint Committee, 1948, p. 50) it was concluded that over-crowded home conditions, apart from the poverty with which they were associated, did not by themselves increase the risks of delivery.

There was, however, an increase in the combined still-birth and neonatal death rate, for both home and hospital confinements, for first births, as crowding in the home increased. The similar increase in both home and hospital confinements suggested that the underlying poverty was the causative factor. For multiparae, on the other hand, the combined still-birth and neonatal death rate increased only in home confinements, but not for hospital confinements. There was evidence that domestic ties resulted in many women being confined at home who would have been more safely confined in hospital.

Sutherland (1949) reported that in the county boroughs of England the still-birth rate showed no association with the degree of over-crowding. For neonatal mortality there was such an association which was attributable to infections in the early weeks of life.

Stocks (1934) in an investigation into the association between mortality and housing in Britain found that increasing density per room at constant density per acre had the effect of increasing mortality. The influence was greatest at ages 1 to 5 years, and was less in infancy and at school age. He analysed his data to measure the correlation of overcrowding with low income, and concluded that not more than a part of the explanation of the association between overcrowding and high mortality was due to economics.

Charles (1951) noted that in Birmingham the standardized neonatal mortality rate rose according to degree of over-crowding.

Investigations into the effects of over-crowding and poor housing generally on infant mortality have been reviewed by the United Nations (1954, pp. 20-22). By comparing the proportion of over-crowded dwellings (two or more persons per room) with the infant mortality rates in 17 countries, they found that in those countries where over-crowded

dwellings did not exceed 10 per cent of the total, the infant deaths were generally below 50 per 1,000 infants born alive. By contrast, in those countries where over-crowded dwellings constituted 30 per cent or more of the total, the infant mortality rate exceeded 100. Studies are quoted from the United States (Woodbury, 1925), England and Wales (Woolf and Waterhouse, 1945) and Italy (Somogyi, 1937) showing the same correlation. Finally they cite a Swedish study by Rietz (1930) which demonstrated that under poor housing conditions the greatest differential mortality rates occurred in the second half of the first year of life. Among the various causes of death, contagious diseases, diseases of the respiratory system, and rickets seemed to be most closely related to poor housing.

In the City of Cape Town housing conditions, especially for Non-Europeans, have for many years been the subject of adverse comment on the part of Medical Officers of Health. The various surveys of housing which have been carried out are discussed elsewhere. If poor housing is indeed a factor in increasing infant mortality, then there is sufficient reason for thinking that at least a part of the high mortality of Non-European infants is due to this factor.

4. NUTRITION.

The effect of nutrition of the mother in her childhood and during pregnancy on the health of her children has been studied by a number of workers. Josey (1954) has reviewed the subject extensively. Unfortunately, comparatively little attention has been devoted to the effects of nutrition upon the mothers' own health.

In Wales an experiment carried out under the direction of Lady Rhys Williams (1936-7) illustrated broadly the effect of improving the diet of pregnant women, as shown in Table 60.

TABLE 60.

MATERNAL DEATH RATE[+] AND STILL-BIRTH AND NEONATAL DEATH RATE [x] PER 1,000 BIRTHS IN TWO AREAS IN SOUTH WALES.

	One area 1934		Another area 1936	
Before experiment	After medical care for 1 yr.	After medical care and additional food for 1yr.	Before experiment	After additional food only
+) 7.20	11.29	4.77	6.65	3.75
x) 92.0	84.0	59.0	-	(National rate 3.64)

This was a pioneer experiment and though not statistically conclusive it did serve to draw attention to the importance of diet in pregnancy.

Ebbs, Tisdall and Scott (1941) carried out an experiment in Toronto on a group of women confined in the General Hospital between 1938 and 1941. The diets of the women were assessed in the early months of pregnancy and on this basis the women were divided into those with "good" and with "poor" diets. Alternate women in the "poor" diet group were given food and vitamin supplements and nutritional advice for an average of 4.7 months. The other women in the "poor" diet group were given no special treatment, and the "good" group were given only nutritional advice. Cases with major disease were excluded, leaving 120 women with "poor" diets, 90 with "supplemented" diets, and 170 with "good" diets. The first group were consistently inferior as regards the incidence of still-births, miscarriages,and premature births. They also had a higher incidence of prenatal and intranatal complications.

The People's League of Health (1942) carried out an experiment in London on over 5,000 pregnant women, half of whom were given vitamin and mineral supplements, the other half acting as controls. It was concluded that the supplements reduced the incidence of toxaemia of pregnancy and of premature births, and slightly increased the birth weight of babies born to women over 30.

Burke et al (1943) on a study of 216 women in Boston concluded that there was a significant relationship between the quality of maternal diet and the course of pregnancy and the condition of the infant at birth and during the first two weeks of life. Poor diet was found to be significantly related to incidence of toxaemia.

Balfour (1944) reported the results of a study of nearly 20,000 pregnant women from the lowest income groups in England and Wales. It was found that the infant's health benefited when supplements of yeast, vitamins A and D, calcium, iron and phosphorous were given. Still-birth and neonatal death rates were significantly lower in the children of the women given the supplement than in those of the controls. No difference was found in maternal mortality rates, and although the experimental group had a lower incidence of toxaemia the difference was

not significant.

Criticism of these three experiments reported by Ebbs, Tisdall and Scott, by the People's League of Health and by Balfour, were made on experimental and statistical grounds by Sinclair (1944). These criticisms, though not necessarily invalidating the conclusions of the authors, showed how difficult it was to plan human experiments and to prove scientifically the value of a good diet in maintaining the health of mothers and infants.

Cameron and Graham (1944) analysed the ante-natal diets of 100 mothers who had still-births, 100 who had premature births and 100 who had full-term births. The diets of mothers of still-born and prematurely born infants showed remarkably little difference from one another but those of mothers of full term infants were significantly better than those of the other two groups. The differences were most noteworthy as regards first class protein, calcium and phosphorus. To confirm these results they supervised the diets of 500 unselected pregnant women. Dietary advice was given and it was seen that these women applied for their priority allowances of food. To serve as a control, the records of 500 unselected "booked" cases were analysed. All confinements occurred in hospital. The supervised group had fewer still-births, premature births and neonatal deaths as well as having more breast fed babies on dismissal from hospital.

Toverud (1950) reported on the experience of a team of workers at a health station providing a service to about one quarter (70,000 people) of the City of Oslo in the years 1939-44. Women were medically supervised from early in pregnancy and through lactation, given dietary advice and food supplements, and the mothers and infants were examined regularly. All the women who attended the health station were volunteers. It was found that the still-birth rate, neonatal mortality rate, the incidence of prematurity, and failure of lactation, were all lower in the women and infants attending the health station as compared with other women and infants from Oslo generally, and from the district in which the station was situated. To evaluate the importance of medical supervision, dietary management and food supplements independently was not possible. This investigation therefore

did not provide conclusive evidence for the importance of correct nutrition in reducing foetal and infant mortality, especially as the women involved were all volunteers and may very well have been superior mothers, apart from being given better diets.

Jeans, Smith and Stearns (1955) studied the dietary habits of 404 women of low income. They found that the incidence of prematurity rose sharply with decrease of nutritional status. The lowest birth weights and a larger number of deaths in the newborn period occurred among the infants born to the most poorly nourished mothers.

On the other hand, a number of studies tended to show that dietary inadequacy in pregnancy did not have serious effects on the mothers. Scrimshaw, Culver and Stevenson (1947) could not explain the variations in incidence of toxaemia on racial, dietary, therapeutic or climatic factors in a 15 year survey involving 10,000 deliveries in Panama. They suggested that adverse social and psychological factors in certain groups may have been an important influence.

Williams and Fralin (1942) studied 514 women in Philadelphia. Of these women 10 were regarded as having good, 209 fair, and 295 poor diets. They found no correlation between adequacy of diet and certain complications in pregnancy and childbirth. Their series was, they admitted, too small to show a correlation between dietary intake and most of the complications of pregnancy, and between dietary intake and still-births and neonatal deaths. The diets of women who were morbid after delivery did not differ markedly from those of the rest of the group.

Smith (1947) found that the war time period of starvation in Holland was associated with a decreased incidence of toxaemia and that the incidences of still-birth and neonatal deaths were unaffected, although birth weights decreased during this period.

McGanity and his co-workers (1955) carried out a study from 1945 to 1949 on 2,046 white women who attended the Vanderbilt pre-natal clinic. The socio-economic status of these women ranged from a "low" to a "low-moderate" income level. The average calorie intake varied from 2,020 to 2,200 calories in the three trimesters of pregnancy. Comparatively few women did not consume a balanced diet, and only 27 per cent were given medicinal dietary supplements. The women had

minimal overt evidence of malnutrition though the average intakes were below usually recommended levels. The team found that in their patients they were unable to indict nutrition as a major causative factor in the development of commonly encountered obstetric and foetal abnormalities. They considered that this meant that either there did not exist a direct causative relationship between malnutrition and these abnormalities, or that their patients were above any such level of nutrition required to precipitate disease.

It can be seen that although some authors have found an association between poor diet of mother in pregnancy and infant morbidity and mortality, others have failed to find such an association. The most likely explanation for this is probably the fact that the foetus has high priority in the competition for nutrients in the maternal blood stream and is able to survive even in fairly severe states of maternal undernutrition. (Hammond, 1944). Only when the maternal nutrition reaches a very low level does the foetus or neonate die. Added to this difficulty is the problem of devising experiments on pregnant women which will provide results which will satisfy the statistical requirements and show a direct and independent association between undernutrition and a depression in the health of mother or infant.

In Cape Town, as we have seen, there is no conclusive scientific proof that Non-Europeans are more malnourished than Europeans, but there is ample circumstantial evidence that this is the case. The previously mentioned frequency of poverty and the high incidence of clinical signs of malnutrition among the Non-Europeans in Cape Town renders it certain that underfeeding is very prevalent in this group. It is highly probable that nutritional factors play an important part in producing inter-racial differences in maternal and infant mortality rates.

5. SIZE OF FAMILY.

The relationship between the parity of the mother (which ultimately determines family size) and the incidence of maternal mortality has already been discussed under the heading of Age and Parity of the Mother. (See Biological Factors).

A number of investigations into the association between size

of family and child health have been carried out.

Yudkin (1944) found that the nutrition of elementary school children from large families was inferior to that of similar children from smaller families. This difference was accentuated in families coming from poor areas as compared with children from a better-off area. He concluded that this was an expression of the common finding that with increasing size of family there was a decreasing available income per head.

Although this investigation was done with elementary school children, there is no reason to believe that similar conditions do not apply to younger children and infants. It has in fact been found in a number of studies that although first born children on the average weigh less at birth than subsequent children, the latter overtake the former in weight growth by the end of the first year. (Meredith, 1950). This is, too, probably an expression of the larger amount of money and food available per head in small families, although other factors such as maternal care and infection also play a part.

In the study by the Joint Committee of the Royal College of Obstetricians and Gynaecologists and the Population Investigation Committee (1948, pp. 19, 32, 56, 98 and 113) it was found that large families, which were commoner among the poorer classes, both restricted the use mothers were able to make of maternity and infant welfare services and lowered the standard of living of the whole family. As family size grew there was a rapid increase in the proportion of over-crowding. Only in the most prosperous group was there no restriction of mother's activity, impoverishment or over-crowding as family size increased.

Robinson (1951) found in a study of 3,266 infants that with increasing size of family there was a rise in the rates of morbidity, mortality and case mortality. Infant mortality per 1,000 infants rose from 13.6 among first, to 23.5 for second and third infants and 45.4 for fourth to twelfth infants. She did not, however, attempt to ascertain whether this effect was independent of social class - an important consideration as many, or even most, of the children in the higher birth orders were probably of the lower social and economic classes.

In a study of the incidence of infectious disease in the

first three years of life related to social circumstances, Lowe and McKeown (1954) found that mortality from infection was higher in children of higher birth rank. This was especially so if the mother was under 30 and living in a poor area.

In Cape Town we have no direct evidence of the differences in family size among Europeans and Non-Europeans. From the differences in fertility rates, however, we can assume that the latter have larger families and that larger size of family with all that it implies, is a factor associated with higher infant mortality.

6. OCCUPATION OF WOMEN.

According to the Report on an investigation into Maternal Mortality (Great Britain, Ministry of Health, 1937) there was an appreciable and important, although not a large association between the puerperal mortality rate and the percentage of women gainfully occupied in England in 1931 (p. 67). The coefficient of correlation was +0.32 $\pm$ .11. No attempt was made in this investigation to see if occupation of mother acted independently of other social factors.

The Joint Committee of the Royal College of Obstetricians and Gynaecologists and the Population Investigation Committee (1948, p. 209) found that where mothers continued working during the last five months of pregnancy the incidence of still-birth and prematurity was considerably higher than when the mother ceased work before the fourth or fifth month of her pregnancy. As the authors pointed out, it is possible that those mothers who worked later in pregnancy were the poorest and worst fed.

In Cape Town no figures are available for the proportions of European and Non-European mothers who worked late in their pregnancies. It is common knowledge, however, that Coloured women, many of whom are employed as domestic servants and in industry, continue to work till pregnancy is fairly far advanced - to a greater extent than do European women, because of their lower socio-economic status.

7. ILLEGITIMACY.

Illegitimacy is known to be one of the social factors associated with high still-birth and infant mortality rates. The reasons for this are not far to seek. The unmarried mother is more likely to

be primiparous and very young, both of which factors increase risks of foetal or infant death. She is more likely also to come from the poorer economic classes, to attempt to conceal her pregnancy, and seek ante-natal care late. After the birth of her baby she and her infant are frequently faced with adverse social and economic conditions. Furthermore, illegitimate infants are much more often unwanted in most societies and therefore tend to be neglected to a greater extent than babies born into complete families.

The incidence of illegitimacy varies considerably from country to country. The United Nations Department of Social Affairs (1954, p. 14) reported the following distribution for 41 countries for the period 1929-36:-

Illegitimate births as per cent of all live births.	Number of countries.
Less than 5 per cent	12
5 to 9 per cent	15
10 to 24 per cent	7
25 per cent and over	7

Sutherland (1949, p. 36) found that in England and Wales the illegitimate still-birth rate was consistently higher than that for legitimate infants, but the excess declined from 36.6per cent in 1928-30 to 15.6 per cent in 1945.

In 22 countries between 1929 and 1936 the mortality rates for illegitimate infants were on the average one and two thirds greater than for legitimate infants. (United Nations, 1954, p. 16). There was little consistency in various countries either in secular trends in this excess of infant mortality for illegitimate infants, or in the way the excess varied among neonates and older infants.

In Cape Town the incidence of illegitimacy has always been higher among the Coloured and Non-Europeans than among the Europeans, as can be seen from Table 61.

In considering the illegitimacy rate among Non-Europeans it should be remembered that certain "customary" or religious marriages are not legally recognised in the Cape Province. Thus children of Moslem marriages (U.G. 54/1937, p. 20) and of Bantu unions recognised

by "lobola", are considered illegitimate unless the parents have also gone through some form of civil marriage. Many unions among Non-European couples are often of long duration and stable, even though they have not been formally legalised. On the other hand, as mentioned previously, births, especially among Non-Europeans, are under-registered and it is likely that illegitimate births have been even less completely registered than legitimate births.

TABLE 61

ILLEGITIMATE BIRTHS AS A PERCENTAGE OF ALL BIRTHS
CAPE TOWN, 1913 - 1951

PERIOD	EUROPEANS		NON-EUROPEANS	
	Total live births	Per cent Illegitimate	Total live births	Per cent Illegitimate
1913-14 to 1915-16	5,670	6.99	7,283	25.83
1916-17 to 1920-21	12,123	6.52	18,390	25.12
1921-22 to 1925-26	12,296	5.35	22,339	24.76
1926-27 to 1930-31	14,327	5.50	28,622	23.10
1931-32 to 1935-36	13,315	4.96	32,319	22.55
1936-37 to 1940-41	11,552	4.93	35,307	21.86
1941-42 to 1945-46	17,861	3.82	37,767	22.96
1946-47 to 1950-51	18,418	2.95	48,428	23.65

Source: M.O.H., Cape Town.

There may thus be considerable differences between the incidence of illegitimacy as measured by legal and by sociological criteria. From the health point of view the sociological criteria are probably more important than the legal ones.

It can be seen from Table 61 that the incidence of illegitimacy (as measured by legal standards) has steadily declined among the Europeans in Cape Town, but that the Non-European incidence has remained at about the same level since 1913-14.

Only in the years 1951-52 and 1952-53 are data available for illegitimacy in Cape Town for the various races separately. It will be seen from Table 62 that in these two years the incidence of illegitimacy is highest among the Native population and lowest among the Asiatics, with Coloureds and Europeans in between. These differences are all

highly significant.

TABLE 62

ILLEGITIMACY BY RACIAL GROUPS - CAPE TOWN
1951-52 AND 1952-53

BIRTHS:	Europeans	Non-Europeans	Coloureds	Asiatics	Natives
Legitimate	6,702	15,780	13,533	669	1,324
Illegitimate	225	5,327	4,359	5	818
Illegitimacy rate, per cent	3.25	25.24	24.36	0.74	38.12

Source: Based upon data from M.O.H., Cape Town.

The association between the incidences of illegitimacy and still-births and infant deaths in Cape Town is shown in Table 63.

TABLE 63

ILLEGITIMACY, STILL-BIRTHS AND INFANT MORTALITY -
CAPE TOWN - 1946-47 TO 1952-53

	EUROPEANS		NON-EUROPEANS	
	Legitimate	Illegitimate	Legitimate	Illegitimate
Total births	24,861	790	53,169	17,169
Total still-births	379	25	1,686	702
Total infant deaths	666	49	4,863	2,388
Still-births/1,000 total births	12.24	31.65	31.71	40.89
Deaths/1,000 live births	27.20	64.05	94.46	145.02

Source: M.O.H., Cape Town, Annual Reports.

The illegitimate foetus and infant are exposed to far greater risks of mortality than the legitimate, both among Europeans and Non-Europeans. The disparity is greater in the infant mortality rates than in the still-birth rates. This suggests again that postnatal conditions are for illegitimate infants more depressed than are prenatal conditions.

For the years 1951-52 and 1952-53 data are available concerning the incidence of infant mortality by legitimacy in the four

main racial groups separately. (Table 64).

TABLE 64

INFANT MORTALITY RATES IN CAPE TOWN
1951-52 AND 1952-53 BY RACE AND LEGITIMACY

	EUROPEAN	NON-EUR.	COLOURED	ASIATIC	NATIVE
INFANT DEATHS:					
Legitimate	159	1,355	1,036	28	291
Illegitimate	14	740	575	1	174
INFANT MORTALITY RATE:					
Legitimate (a)	23.7	85.9	76.6	41.9	219.8
Illegitimate (b)	62.2	138.9	129.6	200.0	212.7
Ratio (b) to (a)	2.6	1.6	1.7	4.8	1.0

Source: Based on data derived from M.O.H., Cape Town

Only tentative conclusions can be drawn from these figures because the number of Asiatic births is small and because the data, especially for Natives, are unreliable. Bearing these limitations in mind, it can be seen that illegitimacy is associated with the greatest proportional increase for Asiatics and the least for Natives, with the European and Coloured increases intermediate. Among Natives the infant mortality rate for illegitimate infants was actually slightly lower than that for legitimate infants. In other words, where illegitimacy was frequent, the difference between infant mortality rates of legitimate and illegitimate infants was small or absent, and vice versa.

It is also noteworthy that where the illegitimacy rate was high, the infant mortality was high, and it is possible that both rates are functions of the same aspects of social pathology.

8. AVAILABILITY AND UTILISATION OF MEDICAL SERVICES.

Another important social influence on maternal and infant mortality is the availability of skilled medical and nursing care and the ability or the willingness of the population to use these facilities. There are several elements in this aspect of preventive and curative medicine.

The increasing availability of effective prophylactic and therapeutic agents such as vaccines, sulphonamides, antibiotics, etc.

has no doubt been a major factor in reducing the morbidity and mortality from infectious diseases. The general decline in mortality from puerperal infections, diphtheria, smallpox, pneumonia, meningitis, tuberculosis, etc. is due to such developments in medical science. But these declines in mortality have usually occurred earlier in technically advanced countries with efficient public health services and among the better-off and better educated sections of the community. To a large degree the utilisation of these scientific developments to their fullest extent is dependent upon the quantity and quality of medical and nursing personnel in the community.

The ability of the people to pay for such medical and health services is primarily determined by the wealth of the members of the community. To a varying extent the economic disadvantages of the poorer sections of the community are overcome by the provision of services which are paid for either by public funds, or charity, or both.

Altenderfer and Crowther (1949) investigated the association between infant mortality rates in 973 urban areas in the United States with populations over 10,000, and four socio-economic factors, viz. per cent of births occurring in hospital, per capita income, percentage of white persons in the population, and size of city. When these factors were tested independently they found that there was a meaningful negative correlation between the percentage of births which occurred in hospital and the infant mortality rate. The correlations for percentage of white persons in the population, and for per capita income independently were much lower. There was virtually no correlation between size of city independently with the infant mortality rate. They concluded that the high correlation between infant mortality and percentage of births in hospital did not necessarily indicate a causal relationship. It was the concomitant circumstances - such as an aseptic environment, the availability of skilled care and of facilities for dealing with emergencies and the better prenatal care associated with hospitalisation - that saved many infant lives.

Sutherland (1949) found no correlation between the still-birth rate and the <u>quantity</u> of ante-natal supervision. "The <u>quality</u> of ante-natal care, which is difficult, if not impossible to measure, is probably

of greater importance". He also found a definite negative correlation between the still-birth rate and the percentage of births which occur in institutions.

Even when medical and health facilities are freely available in a community, there may still be cultural barriers which may prevent mothers seeking and accepting Western pre-natal and post-natal care. Saunders (1954) has, for instance, described the difficulties which Spanish Americans meet in co-operating with Western medical practitioners because of differences in tradition, practice and belief concerning health. His generalisations from experience with patients who were culturally dissimilar from their medical attendants in the United States, apply equally well to the South African situation where doctors and patients are frequently of different cultural backgrounds. Longmore, (1954) showed how the customs and beliefs of Bantu women on the Witwatersrand affected the health of their infants.

Even in relatively homogeneous cultures, such as in Britain, there are social class differences in the way in which health services are utilised.

In the study of Maternity in Great Britain (1948, p. 33) it was found that the wives of men in the better-off social classes came under antenatal supervision earlier than those of the poorer classes. Mothers of larger families, who were usually those least able to pay for private medical supervision of children, were usually the least frequent attenders at child welfare clinics. The authors of the study considered that the well-to-do were not only able to afford private care, but were also more aware of the need for medical supervision during and after pregnancy and were seldom prevented by household ties from making use of the services available. (p. 207).

Gordon (1951) reported on the use of preventive medical services by members of different social classes. He drew attention to the fact that vaccination, immunisation, ante-natal and post-natal supervision and uptake of vitamin foods were provided free, yet advantage of these services was taken to a greater degree by the middle classes than by the poorer classes. He suggested that health education was as important as free provision of services.

The experience of the author in the Lamont Government Health Centre in Durban from 1948 to 1953 is illuminating in this regard. When the Centre was first established the inhabitants of Lamont Native Township were highly suspicious of the motives of the staff. Rumour went round that the Centre's function was to recruit Native patients for the tuberculosis hospital, which was also a Government institution. One of the rare patients in the early weeks confirmed this suspicion because she had seen the letters "TB" printed prominently on a card on the waiting room wall; only later did she discover that this card was for testing eyesight!

Part of the Health Centre's programme was to provide dried milk powder and selected foods free, or at a nominal charge to patients in need of such therapy. At first great difficulty was encountered in getting patients to use these nutritional supplements, and frequently packets of milk powder were found discarded in the bushes not far away from the Centre. Patients wanted only bottles of medicine, or preferably injections, at that stage.

Members of the Health Centre's staff were aware of the part they played as educators of both patients themselves and the community as a whole. By consciously making use of the techniques of health education in their clinical and other contacts, doctors, nurses and health assistants were able to change the ideas and attitudes of the Township towards food supplements, health examinations and hospitalisation which had previously been unpopular with a large proportion of patients.

In 1950-51, 96.8 per cent of 220 Lamont women who gave birth had ante-natal care at a clinic, and 90.9 per cent were delivered by qualified midwives. And in that year the infant mortality rate was 83.7, the neonatal death rate 27.9 and the still-birth rate 31.5. All these rates compared very favourably with those in other municipal housing schemes, and with those of the Non-European population of Cape Town - the majority of whom were Coloured and economically and socially in a better position than the Natives of Lamont Native Township.

In Cape Town the vital statistics for Europeans, particularly in recent years, have been on the same level as those of most modern Western countries. This is probably due to the fact that medical and

other services as well as the social background of the European population have more or less kept pace with developments in advanced industrialized communities in Europe and the United States.

On the other hand, the vital statistics of the Non-Europeans and of the Coloured people, the major group among them, have lagged considerably behind those of the Europeans in the same city.

Although in theory medical and health services are provided free to all citizens of Cape Town if they cannot afford private services, in practice it is far more difficult for Non-Europeans generally to gain admission to a hospital, than it is for Europeans. This is largely due to the fact that the Provincial hospitals cannot cope with the large and increasing numbers of Non-Europeans who require admission. Not only can most Non-Europeans not afford to pay for private maternity and medical services, either as out-patients or as in-patients, as many Europeans can, but their home circumstances are also more unsuitable for domiciliary confinements or medical treatment. In addition the actual numbers of births and deaths are far higher for Non-Europeans in Cape Town.

The total numbers of births registered and percentages of these which occurred in hospital in the city are shown in Table 65.

TABLE 65

NUMBERS AND PERCENTAGES OF BIRTHS IN INSTITUTIONS BY RACE
CAPE TOWN, 1947-48 to 1952-53

RACE	LIVE BIRTHS		STILL-BIRTHS		Significance of difference (1) and (2)
	No. Registered	Per cent in institutions (1)	No. Registered	Per cent in institutions (2)	
Europeans	21,277	72.38	322	70.81	None
Coloureds	51,370	32.44	1,606	44.46	Significant
Asiatics	1,876	37.47	64	28.12	None
Natives	5,655	84.77	381	49.61	Significant
Non-Eur.	58,901	36.68	2,051	44.90	Significant

It can be seen that of mothers who had live born infants the proportion of Non-Europeans who delivered in institutions was approximately

half that of the Europeans. In Cape Town the policy is to admit to public maternity hospitals for delivery only those women who are primiparae or of high parity, or in whom complications are present or expected. Without further data on mothers it is impossible to state how the criteria mentioned above affect European admissions to hospital. It is certain, however, that many more Europeans can afford admission to private maternity nursing homes and are not prevented by family ties from being delivered away from home.

The high proportion of registered Native births which occurred in institutions is interesting. The reason for this figure is probably that all births to Natives in institutions are registered, while many, if not most, domiciliary births remain unregistered. This gives a false impression of a high degree of institutional confinement among Natives. It is likely that the same error applies to the other races, to a considerably smaller extent.

Still-births in all races are most probably completely registered because of the necessity for obtaining a burial certificate. The relative proportions of registered live births and still-births which occur in institutions can be affected by two factors. These are:

1. the completeness of registration of live births, and
2. the extent to which admission of pregnant women to institutions is determined by the presence of conditions which predispose to foetal death.

It can be seen that among the Europeans the proportions of live and of still-births which occurred in institutions were about the same. Assuming that birth registrations are complete, this means that the presence or likelihood of conditions which predispose to still-birth are not an important factor in determining the admission of European women to institutions.

Among the Coloured women the proportion of still-births occurring in institutions is significantly higher than that of live births. If under-registration of Coloured live births had occurred, as it probably did to some extent, the real disparity would have been increased. This indicates that for them admission to an institution for childbirth is determined largely by the presence of factors predisposing to still-

birth, e.g. primiparity, high orders of parity, complications, premature birth, etc.

For Asiatic women the proportions of still-births and live births occurring in institutions are not significantly different.

Among the Natives the proportion of still-births occurring in institutions is much lower than that of live births. It is improbable that Native women likely to produce a still-birth are admitted less frequently than women not so predisposed. The explanation of this unusual finding must certainly be the marked under-registration of Native live births. This conclusion is important because it means that all rates based on registered Native live or total births must be markedly inaccurate. The birth and fertility rates for Natives are therefore under-estimates, and the infant mortality, neonatal mortality and still-birth rates are all over-estimates of the true figures.

The proportion of still-births among Europeans which occurred in institutions is markedly higher than those of the Non-European races. Although other factors may play a part in producing this difference, the inability of Non-Europeans generally to pay for private institutional confinements or to obtain admission to the public maternity hospitals owing to shortage of beds are important factors.

9. MATERNAL EFFICIENCY, INTELLIGENCE AND LITERACY

Ashby (1915) many years ago remarked on the observations of numerous doctors to the effect that in the reduction of infant mortality the intelligent care of the mother was more important than the physical surroundings or the method of feeding of infants.

Paton and Findlay (1926, p. 227-241) considered a mother to be inefficient when the children were repeatedly found to be dirty or verminous, badly clothed and left in bed till all hours of the day and when the house was constantly dirty and uncared for. They concluded that maternal efficiency played a significant part in determining the nutrition of the infant and was more important than over-crowding, as measured by air space per person, or by size of family, or than income per person. If the nutrition was determined by this factor, then it is probable that infant mortality was similarly affected.

Savage (1946) found that infant mortality rates in problem

families had an inverse relationship to intelligence of mothers. The rate rose from 35.4 per 1,000 live births among women of average intelligence to 88.7 per 1,000 among women who were intellectually defective.

Thwaites and Sutherland (1952) reported a method used in the Oxford Child Health Survey for assessing maternal efficiency. The criteria used were:-

(a) State of the home.

(b) Attitude of mother to her child.

(c) State of the child.

(d) Diet of the child.

(e) Health of the mother.

In their masterly long-term study of 1,000 infants and their backgrounds in Newcastle-upon-Tyne, Spence and his co-workers (1954) concluded that "in the study of these families and in attempting to correlate their environments with the health of the children, there emerged one dominating factor - the capacity of the mother. If she failed, her children suffered. If she coped with life skilfully and pluckily, she was a safeguard of their health. In spite of lapses and failures the mother stands out as the cornerstone of the family structure, and our experience confirms that in all sections of society she remains the chief guardian of child welfare, a fact which is sometimes in danger of being forgotten. A family with a good mother can withstand a feckless or even a vicious father, but rarely can a family survive if the mother fails".

The United Nations Department of Social Affairs (1954, p. 22) related illiteracy among women in the reproductive ages and infant mortality in 27 countries and found a positive correlation between these two factors. This does not of course necessarily imply a causal connection, because a high illiteracy rate must go with most of the other factors such as poverty, lack of medical facilities, bad housing, etc. which are known to be associated with high infant mortality rates.

Without a scientific study of the behaviour of mothers in Cape Town it is impossible to compare the efficiency of European and Non-European mothers. If the criteria employed by Thwaites and

Sutherland mentioned above were used, it is probable that the performance of Non-European mothers in general would be considered less efficient on the grounds of the state of the home, the state of the child and the diet of the child. If the mother's health can be gauged by mortality rates, then Non-European mothers would again be assessed as being less efficient because of their higher death rates. It would, however, be difficult to compare attitudes towards children in the different races.

Of course much of this superior efficiency of European mothers is due to the economic advantages they enjoy. It has frequently been observed by the author that even within the lowest social and economic group the infants of some families survive far more readily than those of others. The main deciding factor is the intelligence, energy and resourcefulness of the mother, which varies greatly from home to home even among the most wretched of shack dwellers. This opinion is based on eight years experience in providing a family health and medical care service to several Non-European and European communities in Durban and on a number of intensive family studies carried out over two years in the Windermere, Langa and Retreat areas of Cape Town. However, many Non-Europeans have to face enormous socio-economic problems, and the proportion of mothers who can cope with their difficulties is relatively small.

Another criterion of maternal efficiency that may be used is the incidence of illegitimacy. Although it is basically evidence of family disorganization, the prevalence of unmarried mothers leads to large scale neglect of children and a consequently greater risk of infant mortality.

On the basis of formal educational level Non-Europeans are at a considerable disadvantage as can be seen from the data given in Chapter II. The great popularity of night schools, the sacrifices which many parents make to educate their children, the tremendous rise in the number of scholars, and the over-crowding of schools are all evidence of how keen Non-Europeans as a whole are to acquire the benefits of formal education.

CHAPTER VII

THE MEDICAL CAUSES OF DEATH

I. GENERAL TRENDS

1. TRENDS OF ALL AGES COMBINED.

Mention has already been made of the pitfalls existing in the use of certified causes of death as a basis for epidemiological study, and in comparing the causes of death at different periods.

The lists of causes of death in the Medical Officer of Health's reports in the early decades of the century illustrate one aspect of the difficulty. In these lists appear, inter alia, the diagnoses "ague", "remittent fever", "splenic fever", "dropsy", "debility" and "mortification", each of which would be difficult to fit into a modern nosological table. It is interesting to note also that until 1925 "beri-beri" was classified as a "miasmatic disease", along with small pox, measles, enteric fever, phthisis and influenza.

The difficulties presented by changes in diagnostic fashions and medical knowledge can be largely overcome, at the expense of some specificity, by considering the trends of broader groups of disease.

The registered causes of death for Europeans and Non-Europeans in the City of Cape Town are set out in Table 66.

In this table the first period consists of the first nine complete years after the unification of Cape Town in September, 1913. It includes the year 1918 - 19 when the influenza epidemic produced sharp rises in both European and Non-European death rates.

It can be seen that the Non-European mortality rates have been higher than the European rates for all causes except cardiac diseases, cancer and diabetes mellitus, which are mainly the illnesses of older people.

In the great majority of cases there has been a fall in the rates during the forty years under review. The extent to which the mortality rates for various causes have changed is revealed by Table 67.

TABLE 66

CAUSES OF DEATH BY RACE IN CAPE TOWN 1914/15 TO 1952/53
(Average annual rates per 100,000 population)

Cause of death	1914/5-1922/3		1923/4-1932/3		1933/4-1942/3		1943/4-1952/3	
	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.
Enteric fever	26	45	8	19	2	6	1	5
Measles	7	30	4	23	2	16	1	10
Whooping cough	10	35	8	33	2	34	1	19
Diphtheria	10	15	9	10	6	13	2	4
Tuberculosis (pulm)	84	379	65	396	68	412	47	382
Tuberculosis (other)	21	74	12	62	11	77	9	73
Bronchitis, pneumonia	174	678	91	555	67	408	37	224
Diarrhoea, enteritis	125	437	57	367	25	258	13	223
Syphilis(+)	5	50	6	74	10	59	7	36
Rheumatic fever	3	6	6	14	5	22	2	8
Nephritis	53	69	47	68	47	58	34	36
Cardiac diseases	167	164	161	188	219	179	273	181
Diabetes mellitus	16	3	16	5	31	15	21	12
Cancer	116	53	110	67	139	74	142	73
Violence	63	72	53	66	49	71	44	68
Other causes	393	1129	378	653	345	523	342	469
All causes	1274	3239	1031	2600	1028	2225	976	1823

Source: Taken or calculated from data provided by Medical Officer of Health, Cape Town, 1914/15 to 1952/53.

(+) The diagnosis "syphilis" did not include general paralysis, locomotor ataxia and aneurysm of the aorta in the 1929 classification. In the 1938 revision, these diagnoses were grouped together. (World Health Organisation, 1951, p.36).

TABLE 67

TRENDS OF MORTALITY FROM DIFFERENT CAUSES - CAPE TOWN
1914/15 TO 1952/53

CAUSE OF DEATH	EUROPEANS				NON-EUROPEANS			
	1914/5 to 1922/3	1923/4 to 1932/3	1933/4 to 1942/3	1943/4 to 1952/3	1914/5 to 1922/3	1923/4 to 1932/3	1933/4 to 1942/3	1943/4 to 1952/3
Enteric fever	100	31.3	7.8	5.1	100	42.3	13.4	10.2
Measles	100	59.7	29.9	10.4	100	75.7	52.6	34.2
Whooping cough	100	80.0	20.0	15.0	100	93.8	96.6	54.0
Diphtheria	100	90.0	60.0	18.0	100	68.5	89.0	28.8
Tuberculosis (pulm.)	100	77.8	81.3	56.2	100	104.5	108.7	100.9
Tuberculosis (other)	100	56.6	51.9	39.2	100	83.7	103.9	98.8
Bronchitis and pneumonia	100	52.3	38.5	21.3	100	81.9	60.9	33.1
Diarrhoea and enteritis	100	45.6	20.0	10.6	100	83.9	59.0	51.0
Syphilis (+)	100	113.2	188.7	132.1	100	147.7	117.8	72.7
Rheumatic fever	100	181.8	151.5	51.5	100	229.5	360.7	137.7
Nephritis	100	87.9	87.9	63.6	100	98.3	83.8	52.5
Cardiac diseases	100	96.3	131.0	163.2	100	114.7	109.2	110.6
Diabetes mellitus	100	104.4	196.2	135.4	100	165.5	517.2	417.2
Cancer	100	94.9	119.9	123.0	100	125.5	138.6	137.3
Violence	100	83.5	77.2	69.8	100	92.2	99.2	94.6
Other causes	100	96.2	87.7	86.9	100	57.8	46.3	41.3
All causes	100	81.0	80.7	76.7	100	80.3	68.7	56.3

(+) See footnote to Table 66.

From this table it can be seen that:

For Europeans: The decline in crude mortality rate has been greatest in enteric fever, measles, diarrhoea and enteritis, whooping cough, diphtheria, bronchitis and pneumonia, tuberculosis, rheumatic fever and nephritis - all diseases in which infection plays a prominent

TABLE 68

RATIOS OF NON-EUROPEAN TO EUROPEAN CRUDE MORTALITY RATES CAPE TOWN, 1914-15 TO 1952-53 BY DECENNIA.

Cause of death	1914-15 to 1922-23	1923-24 to 1932-33	1933-34 to 1942-43	1943-44 to 1952-53
Enteric fever	1.8	2.4	3.0	3.5
Measles	4.5	5.8	8.0	14.9
Whooping cough	3.5	4.3	17.0	12.7
Diphtheria	1.5	1.1	2.2	2.3
Tuberculosis (pulmonary)	4.5	6.1	6.1	8.1
Tuberculosis (other)	3.5	5.2	7.0	8.8
Bronchitis and pneumonia	3.9	6.1	6.1	6.1
Diarrhoea and enteritis	3.5	6.4	10.3	16.8
Syphilis (+)	9.5	12.3	5.9	5.2
Rheumatic fever	1.8	2.3	4.4	4.9
Nephritis	1.3	1.4	1.2	1.1
Cardiac diseases	1.0	1.2	0.8	0.7
Diabetes mellitus	0.2	0.3	0.5	0.6
Cancer	0.5	0.6	0.5	0.5
Violence	1.1	1.2	1.4	1.5
Other causes	2.9	1.7	1.5	1.4
All causes	2.5	2.5	2.2	1.9

(+) See footnote to Table 66.

part. Deaths from violence (accidents, homicide, and suicide) declined moderately in incidence. Deaths from cardiac diseases, diabetes mellitus and cancer increased in frequency. Deaths from various forms of syphilis appeared to increase, but this is due largely or wholly to changes in the classification of causes of death employed at different times.

For Non-Europeans: The decline in crude mortality rates has been greatest for enteric fever, diphtheria, bronchitis and pneumonia, measles, diarrhoea and enteritis, nephritis and whooping cough - again all diseases in which infection plays a prominent part. Practically no change occurred in the incidence of deaths due to violence and to tuberculosis. The death rate from syphilis was affected in the same way as for Europeans.

The incidence of deaths from cardiac diseases increased slightly and from rheumatic fever and cancer, moderately. The mortality rate for diabetes mellitus increased very markedly.

In all cases the percentage European decline was greater than the Non-European, with the exception of nephritis. For cardiac diseases there was a greater increase for Europeans than for Non-Europeans, but for cancer and diabetes the increase was greater for Non-Europeans than for Europeans.

The greater decline generally among Europeans for the incidence of various causes of death is shown by Table 68 which gives the Non-European ratios of mortality rates for various causes at different times.

The ratio of Non-European to European incidences of the various causes of death showed an increase in the period under review for all diseases except for syphilis, which decreased considerably, and for nephritis, cardiac diseases and cancer, which remained more or less the same. The great increases in the ratios for the infectious diseases, rheumatic fever and diabetes mellitus are striking.

The mortality rates from various causes in Cape Town and London in two comparable periods are shown in Table 69.

This comparison shows how markedly mortality from infectious diseases, except for tuberculosis, decreased in all three populations. In the two periods reviewed, the mortality rate from all forms of tuber-

culosis for the Non-Europeans of Cape Town remained stationary, but there were considerable decreases in the rates for the two other groups. In general, the improvement in the infectious disease mortality rates for Europeans in Cape Town was greater than that for London, but for the Non-Europeans it lagged far behind.

TABLE 69

COMPARISON OF MORTALITY RATES BY CAUSES
CAPE TOWN AND LONDON. (Per 100,000).

	CAPE TOWN		LONDON	CAPE TOWN		LONDON
	1923-4 to 1932-3		1926-30	1943-4 to 1952-3		1946-50
	Eur.	Non-E.		Eur.	Non-E.	
Enteric fever	8	19	1	1	5	0
Measles	4	23	16	1	10	1
Whooping cough	8	33	11	1	19	2
Diphtheria	9	10	10	2	4	1
Tuberculosis (pulmonary)	65	396	90	47	382	55
Tuberculosis (other)	12	62	14	9	73	6
Bronchitis and pneumonia	91	555	172	37	224	149
Cardiac disease	161	188	229	273	181	331
Diabetes	16	5	12	21	12	7
Cancer	110	67	152	142	73	210
All causes	1031	2600	1230	976	1823	1184

Source: London figures from London County Council (1952), p. 140.

The high rates for mortality from bronchitis and pneumonia in the London population in both periods as compared with that of Cape Town Europeans was probably due to climatic conditions. In the case of cardiac diseases and cancer the comparatively high London rates were probably due largely to differences in age distribution in the two populations.

Before attempting to draw any conclusions from these rates and trends it is necessary to examine these statistics more closely.

When faced with a variation in the incidence of a particular disease over a period of time, or in two communities, one has to decide whether the differences could possibly be due to demographic factors such as variations in the age and sex composition of the communities being compared. It is also necessary to ask whether the diagnoses made in different periods of time are comparable. The World Health Organisation, in a report on the comparability of statistics of causes of death (1952a, p. 5), stated that: "The most difficult problems arose from a conflict between two aims: (1) to bring the nomenclature and system of classification into line with modern concepts, and (2) to maintain continuity of statistics of causes of death as far as possible. Rearrangements of the International List to make it conform to advances in medical science, such as recognition of new disease entities or new knowledge about the etiology of particular diseases, represented only one cause of breaks in the continuity of mortality statistics. More serious difficulties of comparability stemmed from other factors, most important of which were changes in the form of death certificate in use, and increasing tendency to enter more than one cause of death upon it, and diversity in the principles by which the primary or underlying cause was selected for statistical use when more than one was entered".

It is beyond the scope of this study to try to overcome these difficulties, even if the quantity and the quality of the basic data had justified such an attempt. The statistics on the general trends of the causes of death which have been given provide only a broad picture of the differences between Europeans and Non-Europeans in Cape Town.

In general it can be said that the trends of mortality from various causes among the Europeans have been very similar to those of economically and socially advanced communities, whereas those of the Non-Europeans resemble those of less highly developed countries. (Stocks, 1950; Logan, 1954; Taylor and Dauncey, 1955). The main numerical differences in mortality between the two racial groups have been due to the common infectious diseases, tuberculosis, bronchitis and pneumonia, and gastro-enteritis. A large part of these differences in mortality from various causes occurred in infancy.

A sharper focus on these trends will be obtained by a

closer study of the causes of death in infancy in the two racial groups, and of specific diseases which, for various reasons, have been selected to serve as indices of the health of the two populations.

2. TRENDS IN INFANCY.

(a) In the first year of life.

Because of the generally recognized sensitivity of infant mortality to social conditions, it is well to begin with an inter-racial comparison of the trends of the causes of infant deaths. In both the European and the Non-European populations of Cape Town there has been an impressive fall in infant mortality. The changes in the certified causes of death in infants in these groups over the past decades reveal interesting differences in the mechanisms of death which throw light upon the ways in which social conditions express themselves medically.

The mortality rates by causes per 1,000 live births in the same year for European and for Non-European infants under the age of one year are shown in Table 70 and Chart 9.

In this table the causes of death have been grouped by the Medical Officer of Health, Cape Town, and the group "common infectious diseases" includes scarlet fever, erysipelas, diphtheria, whooping cough and measles. The "developmental diseases" group comprises the diagnoses "prematurity", "congenital malformations", "congenital debility", and "diseases peculiar to the first year of life".

Comparing the first quinquennium (1916-17 to 1920-21) with the last (1946-47 to 1950-51), we find that the biggest reductions in mortality of European infants in absolute numbers were for diarrhoea and enteritis (24.3 per 1,000), developmental diseases (13.2), and "bronchitis and pneumonia" (9.5). By the last quinquennium congenital syphilis had practically disappeared as a cause of death. For Non-European infants the reductions in mortality were greatest for "bronchitis and pneumonia" (32.6 per 1,000), "diarrhoea and enteritis" (28.2) and "developmental diseases" (18.3). (Chart 10).

The comparative rates for these causes of death of infants have in all cases, except tuberculosis in Non-European infants, declined considerably. (However, since 1948

TABLE 70.

INFANT MORTALITY TRENDS - CAPE TOWN 1916-1917 TO 1950-1951.

(RATES PER 1,000 LIVE BIRTHS BY CAUSES)

	1916-17 to 1920-21		1921-22 to 1925-36		1926-27 to 1930-31		1931-32 to 1935-36		1936-37 to 1940-41		1941-42 to 1945-46		1946-47 to 1950-51	
Number of Live Births														
European	12123		12296		14327		13315		14580		17861		18418	
Non-European	18390		22339		28622		32319		35307		37767		48428	
Causes of Death	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.	E.	N.E.
Common Infectious Diseases (1)	3.3	6.6	2.4	4.6	3.2	4.3	2.0	5.5	1.0	3.6	0.8	3.3	0.5	2.8
Tuberculous Diseases (2)	1.7	2.2	0.9	2.4	1.1	4.3	1.1	4.4	0.8	4.0	0.9	8.0	0.8	8.7
Syphilis	1.1	9.9	1.0	8.7	1.7	11.9	0.8	10.6	0.4	6.2	0.3	4.7	-	2.5
Bronchitis and Pneumonia	12.3	55.1	9.6	53.4	10.8	47.2	7.4	41.3	5.6	35.6	3.7	32.9	2.8	22.5
Diarrhoea and Enteritis	28.1	58.7	23.9	54.4	14.6	46.7	11.0	39.9	5.8	29.5	6.7	37.9	3.8	30.5
Developmental Diseases (3)	29.0	47.2	23.0	39.7	22.1	37.6	20.0	31.6	18.6	29.5	18.9	31.0	15.8	28.9
Other Causes	15.3	32.0	11.1	18.4	9.2	17.4	7.3	13.9	9.1	14.5	6.6	12.9	5.9	13.2
Total Mortality	90.8	211.7	71.9	181.6	62.7	169.4	49.6	147.2	41.3	122.9	37.9	130.7	29.6	109.1

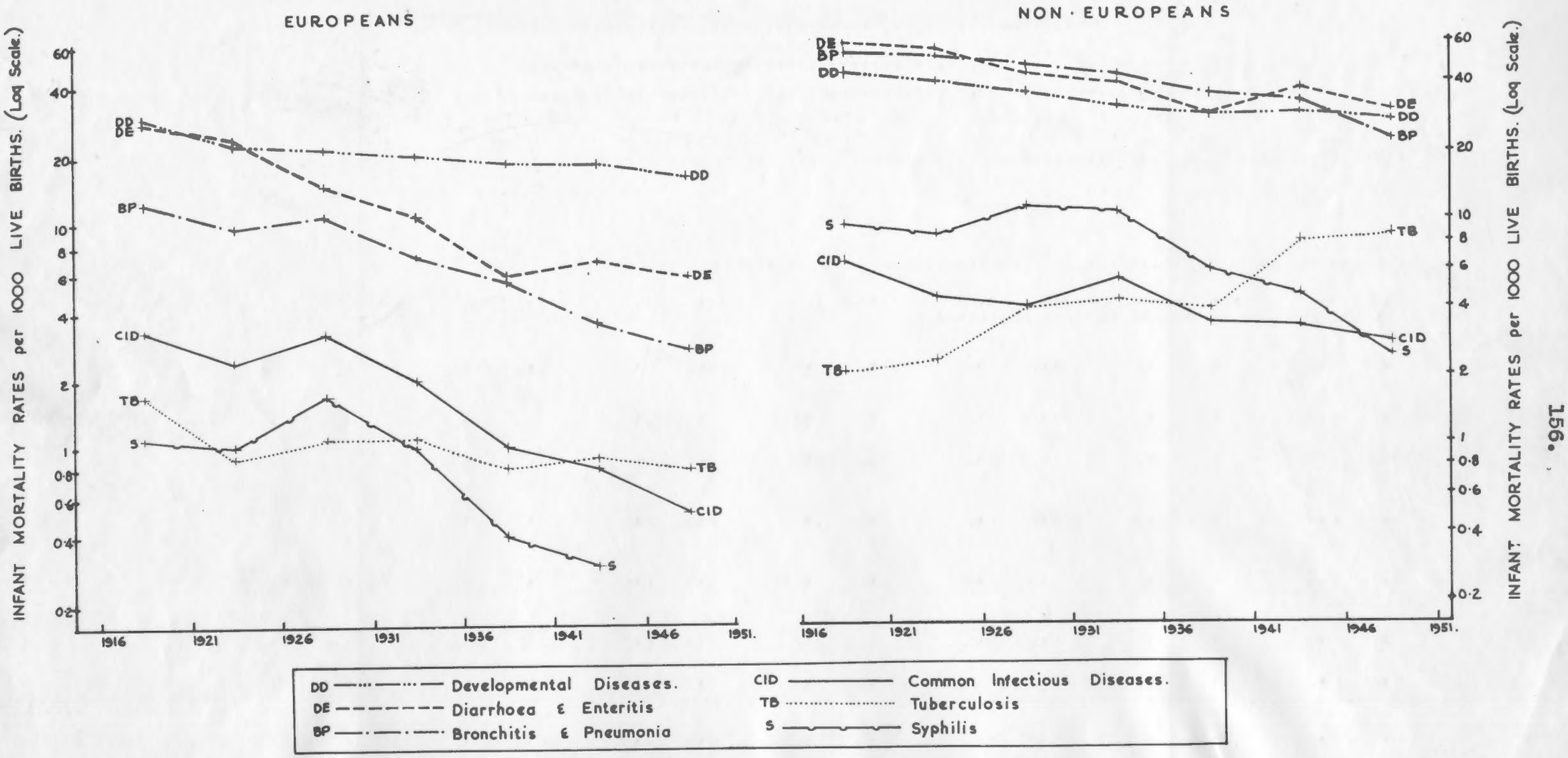
Source: Based on data from Medical Officer of Health, Cape Town.

(2) Since 1948 there has been a sharp decline in the rate.

(1) Scarlet fever, whooping cough, diphtheria, erysipelas and measles.

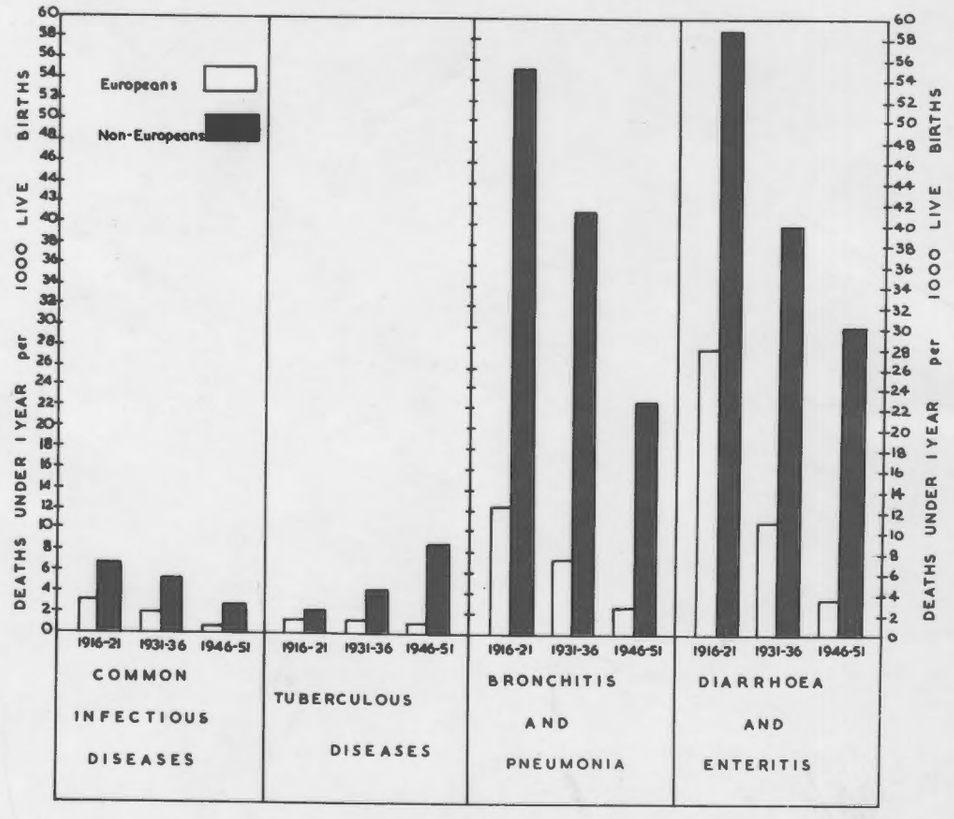
(3) Prematurity, congenital malformations, congenital debility and diseases peculiar to first year of life.

CHART 9.



INFANT MORTALITY TRENDS for SIX MAIN CAUSES of DEATH —— CAPE TOWN 1915-16 to 1950-51.
(QUINQUENNIAL AVERAGES.)

CHART 10.



—— INFANT MORTALITY RATES ——

EUROPEANS AND NON-EUROPEANS —— CAPE TOWN 1916 – 1951

there has been a steady decline in the mortality rate from tuberculosis in infancy, as in other age groups. The average annual figures for Europeans and Non-Europeans in the period 1951-54 were 0.3 and 5.0 respectively.

The secular trends of infant mortality from groups of diseases are given in Table 71 which shows the ratio of mortality rates in later years in relation to those in 1916-1921.

T A B L E 71.

TRENDS OF INFANT MORTALITY FROM DIFFERENT CAUSES, CAPE-TOWN 1916-17 TO 1950-51 BY QUINQUENNIA.

CAUSE OF DEATH	EUROPEANS			NON-EUROPEANS		
	1916-17 to 1920-21	1931-32 to 1935-36	1946-47 to 1950-51	1916-17 to 1920-21	1931-32 to 1935-36	1946-47 to 1950-51
Common infectious diseases	100	60.6	15.2	100	83.3	42.4
Tuberculous diseases	100	64.7	47.1	100	200.0	395.5
Syphilis	100	72.7	-	100	107.1	25.3
Bronchitis and pneumonia	100	60.2	22.7	100	75.0	40.8
Diarrhoea and enteritis	100	39.1	13.5	100	68.0	52.0
Developmental diseases	100	69.0	54.5	100	66.9	61.2
Other causes	100	49.3	38.8	100	43.3	41.4
Total mortality	100	54.6	32.5	100	69.5	51.5

From these figures it can be seen that in the period from 1916 to 1951:

(i) The European rates for the six main causes of infant death were all considerably lower than those for Non-Europeans.

(ii) The downward trends for mortality of European infants were more consistent than those for Non-Europeans.

(iii) For both groups the decline was slowest for developmental diseases.

(iv) In contrast with the other causes of infant mortality,

tuberculosis increased as a cause of infant deaths among Non-Europeans.

(v) The downward trend in mortality of European infants from diarrhoea and enteritis, bronchitis and pneumonia, and the common infectious diseases of infants, began before the introduction of sulphonamides in 1936. The direction of the curve for mortality from these diseases hardly changed since that date. Similarly there was little change in direction of these curves since the introduction of penicillin and other antibiotics during the post-war period. The only curves which might have been affected by the introduction of these great therapeutic discoveries are those for mortality of Non-European infants from bronchitis and pneumonia, and syphilis in the 1946-1951 period.

A comparison of the ratios of Non-European to European infant mortality rates from various causes in different quinquennia is of considerable value. (Table 72). Such a comparison largely obviates the objection that the criteria for diagnosis have changed with the passage of time.

TABLE 72

RATIOS OF NON-EUROPEAN TO EUROPEAN INFANT MORTALITY FROM VARIOUS CAUSES. CAPE TOWN, 1916-17 TO 1950-51

CAUSE OF DEATH	1916-17 to 1920-21	1921-22 to 1925-26	1926-27 to 1930-31	1931-32 to 1935-36	1936-37 to 1940-41	1941-42 to 1945-46	1946-47 to 1950-51
Common infectious diseases	2.0	1.9	1.3	2.7	3.6	4.1	5.6
Tuberculous diseases	1.3	2.7	3.9	4.0	5.0	8.9	10.9
Syphilis	9.0	8.7	7.0	13.2	15.5	15.7	- x
Bronchitis and pneumonia	4.5	5.7	4.4	5.6	6.4	8.9	8.0
Diarrhoea and enteritis	2.1	2.3	3.2	3.6	5.1	5.7	8.0
Developmental diseases	1.6	1.7	1.7	1.6	1.6	1.6	1.8
Other causes	2.1	2.0	2.0	1.9	1.6	2.0	2.2
All causes	2.3	2.5	2.7	3.0	3.0	3.4	3.7

(x) In this period the infantile death rate for syphilis for Europeans was less than 0.1 per 1,000 live births.

These ratios show that for the common infectious diseases, tuberculosis, syphilis, bronchitis and pneumonia, and diarrhoea and enteritis, the disparity in infant mortality rates for Europeans and

Non-Europeans has increased over the period under review.

Only in the case of "developmental diseases" and of "other causes" has the decline in mortality of the two groups of infants been parallel.

In order to provide a more specific comparison between the causes of death in European and Non-European infants in recent years the following data are given for the quinquennium 1948-49 to 1952-53. (Table 73).

TABLE 73

INFANT MORTALITY RATES BY RACE AND CAUSE CAPE TOWN, 1948-49 TO 1952-53.

(Total live births: Eun 17,445; Non-European 50,935)

Cause of death	No. of deaths		Rate per 1000 L.B.	
	Eur.	Non-E.	Eur.	Non-E.
Whooping cough	4	64	0.23	1.26 x
Diphtheria	-	7	-	0.14x
Measles	-	18	-	0.35x
Tuberculosis of C.N.S.	6	137	0.34	2.69x
Tuberculosis of Abdominal Organs	-	6	-	0.12x
Tuberculosis- other forms	3	217	0.17	4.26x
Syphilis	-	67	-	1.32x
Simple meningitis	-	18	-	0.35x
Bronchitis	2	156	0.11	3.06x
Pneumonia	37	718	2.12	14.10x
Diarrhoea and enteritis	58	1808	3.32	35.50x
Convulsions	1	19	0.05	0.37x
Congenital malformations	56	112	3.21x	2.00
Congenital debility	-	66	-	1.30x
Premature birth	170	975	9.74	19.14x
Injury at birth	40	215	2.29	4.22x
Other diseases of early infancy	35	197	2.01	3.87x
Suffocation	4	22	0.23	0.43
Other causes	43	411	2.46	8.07x
All causes	459	5233	26.28	102.73x

Source: M.O.H. Cape Town, 1952-53. (x) indicates rate is significantly higher.

It can be seen that for the great majority of causes of infantile death the Non-European rates were significantly higher than the European rates. The outstanding exception was that for congenital malformations which was significantly higher in the five years 1948-49 to 1952-53 for European infants.

Because of this surprising result the incidence of infantile death due to congenital malformations in earlier periods was investigated. (Table 74).

TABLE 74

INCIDENCE OF CONGENITAL MALFORMATIONS AS A CAUSE OF INFANT MORTALITY. CAPE TOWN 1936-37 TO 1947-48

PERIOD	LIVE BIRTHS		INFANTILE DEATHS DUE TO CONGENITAL MALFORMATION		RATE PER 1,000 LIVE BIRTHS	
	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.
1936-37 to 1939-40	11410	27891	32	58	2.80	2.08
1940-41 to 1943-44	13511	28839	44	73	3.26	2.53
1944-45 to 1947-48	15643	34121	52	66	3.32	1.93

From the figures it can be seen that in each of the four year periods between 1936-37 and 1947-48 there was a lower incidence of infantile deaths ascribed to congenital malformations among the Non-European population of Cape Town. However, only in the third of these periods was the difference significant.

The figure for Non-Europeans is also unexpectedly low as compared with the rate of 3.82 given for the Administrative County of London 1951 (London County Council, 1952, p. 143) and the rate of 3.49 reported by the Registrar-General for England and Wales. It is of interest that in this population the infant mortality rate from congenital malformation rose fairly steadily from 3.49 in the professional and managerial classes to 4.75 in the unskilled labourer classes. (Great Britain, Registrar-General, 1954, Table VIIIF). In general, one would also expect a higher incidence of and death rate from congenital malformations among the underprivileged classes in view of the association between undernutrition and foetal abnormalities reported by Warkany (1945).

It is possible that the low rate for this cause of death among Non-Europeans is due to faulty notification, but it is obvious that the subject merits further investigation.

(b) Causes of mortality in the second year of life.

An illuminating picture of the comparative health of Cape Town infants between the ages of one and two years is provided by a series of mortality tables in the Medical Officer of Health's Annual Reports. These show that the disparity between European and Non-European mortality rates for this age group was even greater than that for infants under one year of age. (Table 75).

TABLE 75.

MORTALITY RATES OF INFANTS 1 TO 2 YEARS OF AGE.
CAPE TOWN, 1926-27 TO 1950-51 (x)

Cause of Death	1926-27 to 1930-31		1931-32 to 1935-36		1936-37 to 1940-41		1941-42 to 1945-46		1946-47 to 1950-51	
	E.	N-E.	E.	N-E.	E.	N-E.	E.	N-E.	E.	N-E.
Common infectious diseases	2.8	6.4	2.1	6.2	0.7	5.1	0.9	3.9	0.3	3.6
Tuberculous diseases	1.1	6.9	0.9	7.5	1.2	7.3	0.9	14.1	0.7	12.7
Syphilitic diseases	-	1.1	-	2.1	0.1	0.9	-	0.9	-	0.6
Bronchitis and pneumonia	3.3	28.9	3.7	24.8	2.6	22.4	0.9	19.3	0.6	9.6
Diarrhoea and enteritis	4.8	24.3	2.5	19.2	2.1	15.9	1.6	20.9	0.6	13.3
Developmental diseases	0.3	0.6	0.2	0.4	0.2	0.4	0.2	0.4	-	0.1
Other causes	2.9	8.6	3.0	7.3	2.6	6.9	1.3	5.7	0.8	4.1
All causes	15.2	76.7	12.4	67.4	9.5	58.8	5.8	65.2	3.0	44.0

(x) The rate is calculated on the number of births (less the deaths under one year) in the previous year.

Source: M.O.H., Cape Town, 1952-53.

Table 76 shows how these groups of causes of death have varied for European and Non-European infants one to two years old from 1926 - 1951.

It can be seen that for European children in the second year of life there was a decline in mortality from all groups of causes which

was in general steeper than the decline in the first year of life. (Tables 76 and 77).

TABLE 76

TRENDS OF MORTALITY FROM DIFFERENT CAUSES FOR INFANTS ONE TO TWO YEARS OLD. CAPE TOWN, 1926-27 TO 1950-51

Europeans

CAUSES OF DEATH	1926-7 to 1930-1	1931-2 to 1935-6	1936-7 to 1940-1	1941-2 to 1945-6	1946-7 to 1950-1
Common infectious diseases	100	75.0	25.0	32.1	10.7
Tuberculous diseases	100	81.0	109.0	81.0	64.0
Syphilitic diseases	-	-	-	-	-
Bronchitis & pneumonia	100	112.1	78.8	27.3	18.2
Diarrhoea & enteritis	100	52.1	43.7	33.3	12.5
Developmental diseases	100	66.7	66.7	66.7	-
Other causes	100	103.4	89.7	44.8	27.6
All causes	100	81.6	62.5	38.2	19.7

Non-Europeans

Common infectious diseases	100	96.9	79.7	60.9	56.3
Tuberculous diseases	100	108.7	105.8	204.3	184.1
Syphilitic diseases	100	190.9	81.8	81.8	54.5
Bronchitis & pneumonia	100	85.8	77.5	66.8	33.2
Diarrhoea & enteritis	100	79.0	65.4	86.0	54.7
Developmental diseases	100	66.7	66.7	66.7	16.7
Other causes	100	84.9	80.2	66.3	47.7
All causes	100	87.9	76.7	85.0	57.4

For Non-European children in this latter age period the mortality rate for tuberculosis rose just as it did for the younger infants. For all other groups of causes of death there was a decline similar to the trend in the first year.

(c) Comparison of mortality in first and second years of life.

Figures from Tables 70, 72 and 75 are summarised in Table 77 to show the trends of mortality, by cause, in the first and second

TABLE 77.

Comparison of Mortality Rates and Ratios for European and Non-European Infants in the First and Second Years of Life

Cape Town 1926-27 to 1930-31 and 1946-47 to 1950-51.

	1926-27 to 1930-31.						1946-47 to 1950-51.					
	First Year of Life.			Second Year of Life.			First Year of Life.			Second Year of Life.		
	Mortality Rate.		Ratio.	Mortality Rate.		Ratio.	Mortality Rate.		Ratio.	Mortality Rate.		Ratio.
	N.E.	E.	NE/E	N.E.	E.	NE/E	N.E.	E.	NE/E	N.E.	E.	NE/E
Common Infectious Diseases	4.3	3.2	1.3	6.4	2.8	2.3	2.8	0.5	5.6	3.6	0.3	12.0
Tuberculosis	4.3	1.1	3.9	6.9	1.1	6.3	8.7	0.8	10.9	12.7	0.7	18.1
Syphilis	11.9	1.7	7.0	1.1	-	-	2.5	-	-	0.6	-	-
Bronchitis, Pneumonia	47.2	10.8	4.4	28.9	3.3	8.8	22.5	2.8	8.0	9.6	0.6	16.0
Diarrhoea, Enteritis	46.7	14.6	3.2	24.3	4.8	5.1	30.5	3.8	8.0	13.3	0.6	22.2
Developmental Diseases	37.6	22.1	1.7	0.6	0.3	2.0	28.9	15.8	1.8	0.1	-	-
Other Causes	17.4	9.2	1.9	8.6	2.9	3.0	13.2	5.9	2.2	4.1	0.8	5.1
All Causes	169.4	62.7	2.7	76.7	15.2	5.0	109.1	29.6	3.7	44.0	3.0	14.7

years of life during the period 1926-27 to 1950-51. It should again be noted that since 1948 there has been a sharp decline in mortality from tuberculosis, and that this is not reflected in these tables.

It can be seen from the table that the disparity between European and Non-European mortality rates rapidly increased for all groups of causes in age group one to two years in the period 1926-27 to 1950-51. Even though the decline in mortality for Non-European infants under the age of one year has lagged behind that of European infants of the same age group, the lag has been even greater in the second year of life. It appears that the well-known disadvantages to which infants in the poorer classes are exposed in the post-neonatal period (4 to 52 weeks) persist into the second year of life as well. The death rates for Non-European infants in the age group 1 - 2 years from diarrhoea and enteritis, bronchitis and pneumonia, and tuberculosis, were even higher than those of European infants under the age of one year. Whereas the mortality rate of European infants aged one to two years in 1946-51 was only 3.0 per 1,000, that of the Non-Europeans was 44.0 - a figure even higher than that of European infants under one year.

(d) Discussion.

The trends of the causes of infant mortality in England and Wales as shown by Taylor (1954) are similar to those manifested by the European infants in Cape Town. On the other hand, the downward trend of mortality of Non-European infants in the first two years of life has lagged far behind that of European infants. The mortality from various forms of tuberculosis increased considerably for both infants under one year and those one to two years of age, reaching a maximum in 1947-48 since when there has been a rapid decline. (M.O.H., Cape Town 1953-54).

The numerical differences between the infant mortality rates of the Europeans and the Non-Europeans have been due mainly to diarrhoea and enteritis, bronchitis and pneumonia, and prematurity - all of which have decreased more among Europeans in recent years.

It is of interest that in Scotland, McKinlay (1952) found the infant mortality rate of the lower social classes to be twice as high as that of the upper, and the difference was due to the same three

groups of causes mentioned above.

Douglas (1951) reported similar findings in a survey in Britain, but showed that there were no significant class differences in mortality in the second year of life.

In Cape Town it appears that not only is the infant mortality rate a delicate index of social and economic conditions, but it seems that the mortality rates of older infants is of equal or greater sensitivity.

CHAPTER VIII

THE MEDICAL CAUSES OF DEATH

II. INDEX DISEASES.

INTRODUCTION.

Certain diseases have long been known to kill proportionately more people in poorer than in well-to-do classes. These causes of death are often called "social diseases", and their incidences are frequently regarded as indices of social and economic conditions. Well known examples of this group are tuberculosis, diarrhoea and enteritis, bronchitis, pneumonia, and rheumatic heart disease.

Other diseases are on the whole indicators of the efficiency of administrative action aimed at safeguarding the health of the community. Examples of this group are enteric fever, cholera and small pox.

In recent years increasing attention is being paid to the so-called "degenerative diseases". Their importance as killers is growing because so many more persons survive into middle and old age in modern communities. Most of these maladies affect the economically better off to a greater extent than the poorer classes, although some of this disparity is due to differences in age distribution. Among this group of diseases are coronary heart disease and certain forms of cancer.

Because of the differences in their epidemiology, some of these causes of death will be regarded as index diseases, and will be more fully investigated in order to draw inter-racial comparisons.

1. TUBERCULOSIS.

Tuberculosis is the classical "social disease". In the words of McDougall (1949, p.1) "There is practically no aspect of human relationship which does not affect, to a greater or lesser degree, the incidence of tuberculosis, and it has been well said that the best barometer of any country's progress in civilization, health and welfare, is to be found in the annual returns of the number of its people who die from this disease".

General inter-racial trends.

Tuberculosis in recent years has become less important as a

cause of death in all communities advanced enough to publish vital statistics. Table 78 shows the diminution of the proportion of deaths in the four main racial groups in Cape Town from 1937-38 to 1953-54.

TABLE 78

DEATHS DUE TO TUBERCULOSIS (ALL FORMS) AS A PROPORTION OF ALL DEATHS. CAPE TOWN, 1937-38 to 1953-54.

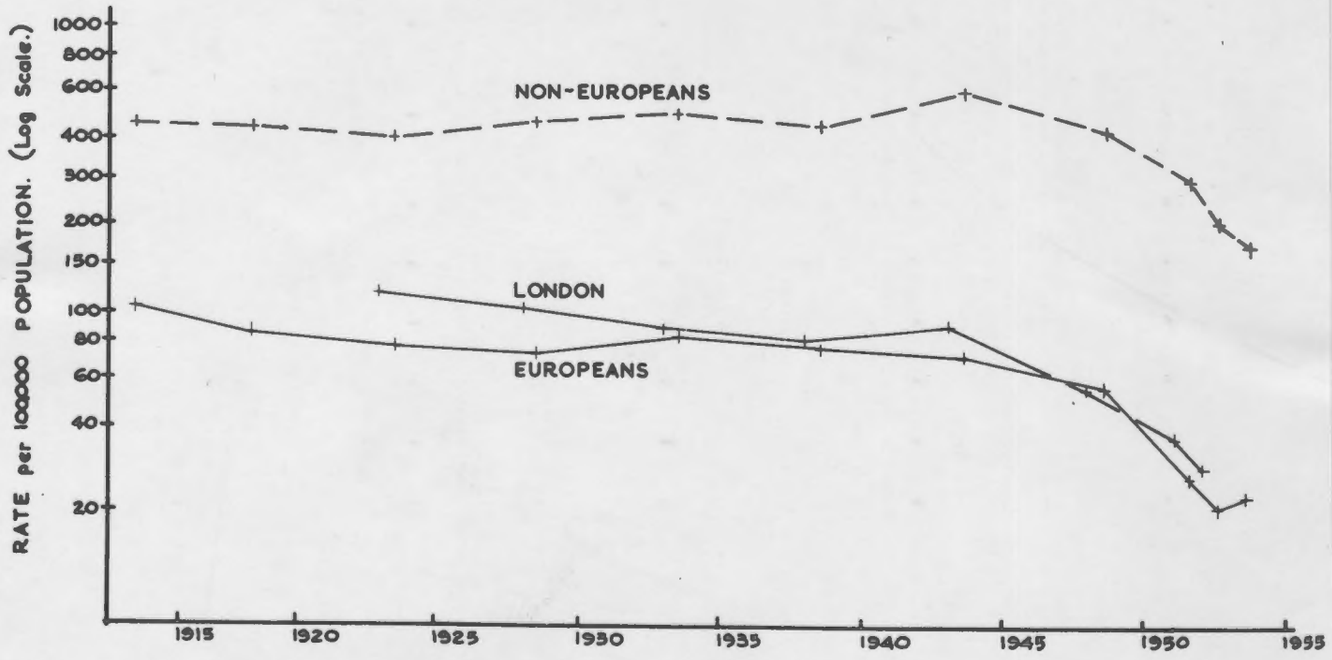
PERIOD	EUROPEANS		COLOUREDS		ASIATICS		NATIVES	
	Deaths	%	Deaths	%	Deaths	%	Deaths	%
1937-38 to 1940-41	508	7.8	1503	21.0	31	14.2	374	26.9
1941-42 to 1944-45	492	6.8	3456	25.9	45	16.0	633	29.7
1945-46 to 1948-49	475	6.5	3521	28.2	41	15.8	850	31.9
1949-50	106	5.9	737	23.6	10	17.2	205	29.5
1950-51	86	4.8	693	23.7	7	9.9	176	24.6
1951-52	49	2.7	612	20.1	5	8.5	157	21.5
1952-53	40	2.2	457	15.8	5	8.6	127	18.4
1953-54	46	2.6	414	15.0	2	3.3	69	12.9

The greater importance of tuberculosis as a cause of death among the Non-Europeans is still apparent, despite the recent decline in tuberculosis mortality. The crude mortality rates for tuberculosis for the two main official racial groupings are shown in Table 79 and Chart 11.

These figures and the chart reveal the enormous inter-racial differences in mortality from tuberculosis in Cape Town over the past forty years. The fall in mortality among Europeans began in the 1930's, but among the Non-Europeans the decline started ten years later.

From Table 79 it can also be seen that the ratio of Non-European to European death rates from all forms of tuberculosis greatly increased in the forty year period under review. Whereas the disparity was due until 1942-46 to an increase in the Non-European rate, in the latter part of the period it was due to the more rapid decline in the European rate.

CHART II.



MORTALITY RATES for TUBERCULOSIS (All forms.)
CAPE TOWN and LONDON
Quinquennial averages up to 1946-51.

TABLE 79

DEATHS AND CRUDE MORTALITY RATES FROM TUBERCULOSIS (ALL FORMS) CAPE TOWN, 1913-16 TO 1953-54. (PER 100,000)

PERIOD	EUROPEANS		NON-EUROPEANS		RATIO (b)/(a)
	Deaths	Rate (a)	Deaths	Rate (b)	
1913-14 to 1915-16	269	104	1080	469	4.5
1916-17 to 1920-21	475	88	1911	447	5.1
1921-22 to 1925-26	454	79	1914	409	5.2
1926-27 to 1930-31	506	74	2723	475	6.4
1931-32 to 1935-36	634	84	3296	499	5.9
1936-37 to 1940-41	594	76	3405	455	6.0
1941-42 to 1945-46	628	72	4199	606	8.4
1946-47 to 1950-51	531	57	4911	450	7.9
1951-52	49	26	739	297	11.4
1952-53	40	21	551	207	9.9
1953-54	46	24	485	177	7.4

Source: Medical Officer of Health, Cape Town. Annual Report, 1952-53.

Part of this disparity in the crude rates can be explained by differences in the age composition of these two populations. It has already been seen that there were comparatively more Non-Europeans in the very young age groups, and that the age group 0 - 4 years had a high tuberculosis death rate.

Since 1937-38 separate figures for the four racial groups for mortality from tuberculosis are available. These mortality rates are shown in Table 80.

These figures demonstrate that there were considerable differences in mortality from tuberculosis among the three sections of the Non-Europeans. Those for Natives have been the highest, those for Asiatics the lowest, with those for Coloureds intermediate, and there was close correspondence between the rates for Coloureds and for all Non-Europeans.

It is probable that the Native rates have been artificially raised to a greater degree by under-enumeration at censuses, than have

the Coloured and Asiatic rates. Nevertheless the Native rates were of alarming proportions, especially during the years of World War II. It will be shown later than in the Langa Municipal Native Township (Table 82) the rates were considerably lower than those for Natives living elsewhere in the city, but still far higher than those for other racial groups. It is unfortunately impossible to ascertain how far this was due to the better enumeration of the population in a supervised housing scheme, and what part was attributable to other factors such as better housing, social conditions, medical care, etc.

T A B L E 80

INTER-RACIAL COMPARISON OF MORTALITY RATES FOR TUBERCULOSIS. CAPE TOWN, 1937-38 TO 1953-54. (PER 100,000)

Year Ending June 30th	European	Coloured	Asiatic	Native (+)	Non-European
1938	86	470	225	655	476
1939	79	465	110	778	477
1940	72	419	215	585	425
1941	77	463	290	759	477
1942	73	522	75	967	538
1943	68	585	301	1080	609
1944	73	612	395	1133	690
1945	73	566	230	908	590
1946	74	568	100	1023	598
1947	71	499	173	804	517
1948	66	552	205	706	544
1949	45	458	154	629	469
1950	57	378	152	584	395
1951	46	341	104	459	347
1952	27	188	73	412	297
1953	21	201	70	276	207
1954	24	178	28	105	177

(+) Excluding Langa Municipal Township.

Source: Medical Officer of Health, Cape Town. Annual Reports, 1937-38 to 1952-53.

As previously stated, the Non-European decline in mortality rates began later than the European. It can be seen that among Non-Europeans the peak year was 1943-44, and that in all groups the rate of decline increased markedly after 1947-48. (Chart 11).

A comparison of crude mortality rates from all forms of tuberculosis in various populations is shown in Table 81.

TABLE 81.

COMPARISON OF CRUDE MORTALITY RATES FROM ALL FORMS OF TUBERCULOSIS IN VARIOUS POPULATIONS. (PER 100,000).

YEAR	CAPE TOWN (1)		SOUTH AFRICA (2)			ENGLAND & WALES (3a) & (3b)	NETHER-LANDS (4)	LONDON (5)
	Eur.	Col.	Eur.	Col.	Asiat.			
1938	86	470	38	-	-	62	45	73
1939	79	465	36	-	-	63	41	78
1940	72	419	35	-	-	70	44	93
1941	77	463	34	-	-	73	59	116
1942	73	522	36	-	-	66	61	93
1943	68	585	33	-	-	67	70	88
1944	73	612	34	-	-	63	75	84
1945	73	566	32	452	180	61	86	78
1946	74	568	33	447	165	55	47	66
1947	71	499	32	455	149	55	37	67
1948	66	552	31	453	143	51	28	62
1949	45	485	27	448	140	46	24	52
1950	57	378	24	387	103	36	19	40
1951	46	341	21	358	90	31	16	38
1952	26	288				24	12	30
1953	21	201				20	9	
1954	24	178						

Sources:
(1) M.O.H., Cape Town, 1937-38 to 1953-54.
(2) U.G. 40/1954, p. 11 and Table 1.
(3a) World Health Organisation, 1951, p. 63.
(3b) Great Britain, Ministry of Health, 1954, p. 26.
(4) De Haas (1955).
(5) London County Council, 1952, p. 144.

From this comparison it can be seen that the crude tuberculosis mortality rates for Europeans were considerably higher in Cape Town

than in South Africa generally in the period 1938-45. After 1950 the Cape Town rate declined rapidly to the South African level. Moreover, Europeans in Cape Town had rates which, if the war years 1940-45 were omitted, were almost invariably higher than those of England and Wales, the Netherlands and the Administrative County of London. This is a rather surprising finding in view of the favoured socio-economic position of Europeans in Cape Town as compared with the total population of a city like London. The very low rates for mortality from tuberculosis in the Netherlands in the post-war period are an indication of how much of the mortality from this cause is preventable.

The very high crude tuberculosis mortality rates for Coloureds were of a similar order in Cape Town and in South Africa as a whole. In the few years for which comparable figures are available, it appears that the Cape Town rates, higher than the South African rates in 1945, declined more rapidly than the latter after 1946.

Sex variation in mortality from tuberculosis.

An inter-racial comparison of the mortality rates from tuberculosis for males and females separately is given in Table 82 and illustrated in Chart 12.

TABLE 82

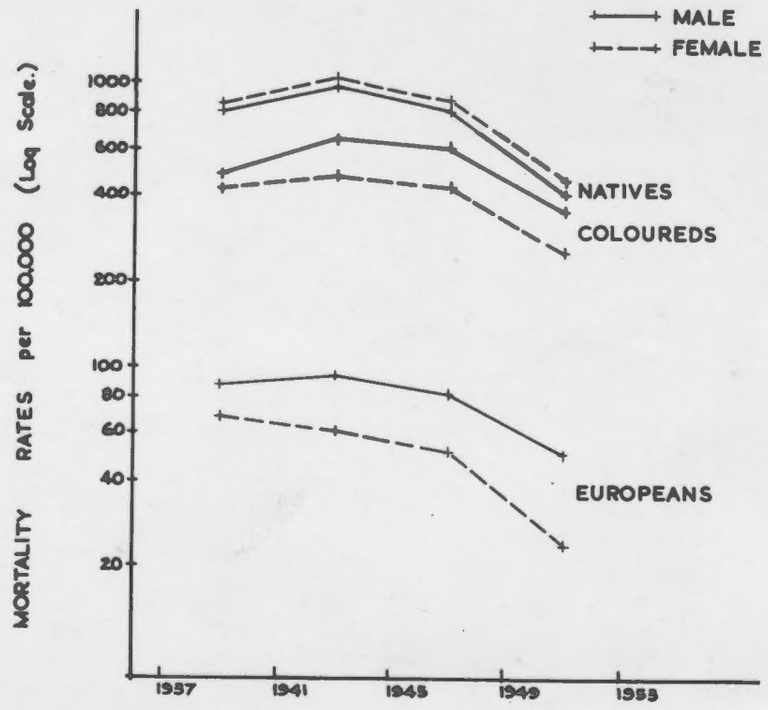
SEX DIFFERENCES IN MORTALITY RATES FROM ALL FORMS OF TUBERCULOSIS BY RACE. CAPE TOWN, 1924-25 TO 1952-53.
(Rates per 100,000 - annual averages)

	EUROPEANS			COLOUREDS			ASIATICS			NATIVES (not Langa)			NATIVES (Langa)		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
1924-25 to 1926-27	113	55	83	455	431	446	-	-	-	-	-	-	-	-	-
1937-38 to 1940-41	89	69	79	485	427	454	261	90	210	638	840	694	388	597	457
1941-42 to 1944-45	95	62	77	650	491	565	308	206	277	985	1198	1044	509	812	604
1945-46 to 1948-49	83	51	66	607	441	518	156	194	165	805	897	829	423	748	530
1949-50 to 1952-53	50	24	38	369	258	310	107	78	95	407	457	424	306	614	391

- - - Previous to 1937-38 rates for the separate Non-European groups are not available. The Coloured rates in 1924-25 to 1926-27 are those of all Non-Europeans. The Coloured people constituted 86.1 per cent of the Non-Europeans at the time of the 1926 census.

Source: M.O.H., Cape Town. Annual Reports 1937-38 to 1952-53. Based on estimated populations.

CHART 12



TRENDS of MORTALITY from TUBERCULOSIS (All forms.)
CAPE TOWN 1937-38 to 1952-53.
By Sex and Race.

From these figures it is apparent that there were usually considerable differences between the sexes with regard to mortality rates from tuberculosis.

Among the Europeans the disparity was very marked, the male rate often being twice as high as the female. In the Coloured population, the male rate was also much higher than the female, but the disparity was not as great as among the Europeans. Asiatic males generally had higher rates than females, but the numbers involved were small and the trend was rather inconsistent.

On the other hand, among the Native population, females consistently had higher rates than males, and this applied to Natives whether living in the Langa Municipal Housing Scheme or elsewhere. The reasons for this are probably the same as those suggested in Chapter VI when the higher mortality rates of females in the Native population were discussed.

Age variations in mortality from tuberculosis.

For the years before 1925, data are not available for the calculation of sex and age specific death rates because in the earlier years deaths were not reported for each age group for males and females separately.

In Table 83 the age specific tuberculosis mortality rates have been calculated on the basis of the age distributions of the population in Cape Town at the censuses of 1904, 1911, 1921, 1926, 1936, 1946, and 1951. At the time of writing the age distribution of the Native population in 1951 is not available. The Non-European rates for 1950-52 refer therefore to Coloureds only. As the numbers of deaths in each age group each year were rather small, the average annual number of deaths was calculated from the records of the year of the census and the years immediately preceding and following the census year.

It is evident that there has been a considerable decline in mortality rates for all age groups from 1903-05 to 1950-52. For the Europeans this decline has been fairly consistent throughout this period. For the Non-Europeans the downward trend was in general halted in 1945-47, but in the ten years prior to this period there was a considerable influx of Natives into Cape Town, and the 1950-52 rates refer to

Coloureds only. Nevertheless it is noteworthy that the mortality rate for Coloured children 0 - 4 years old in 1950-52 was higher than that for Non-European children in 1925-27 and 1935-37.

TABLE 83

AGE SPECIFIC MORTALITY RATES FROM ALL FORMS OF TUBERCULOSIS CAPE TOWN, 1903-5 TO 1950-2. (RATES PER 100,000).

(a) EUROPEANS

Age group	1903 -05	1910 -12	1920 -22	1925 -27	1935 -37	1945 -47	1950 -52
0 - 4	330	186	75	67	65	62	37
5 - 14	50	92	26	11	31	23	7
15 - 24	126	89	66	63	80	49	28
25 - 34	169	166	111	102	102	105	43
35 - 44	253	305	131	125	74	90	43
45 - 54	414	272	155	142	87	83	63
55 - 64	546	296	147	134	110	121	104
65 - 74	224	324	129	127	60	88	58

(b) NON-EUROPEANS

			(1)			(2)	(3)
0 - 4	1659	848		534	474	984	582
5 - 14	285	228		147	150	180	70
15 - 24	504	477		465	453	415	259
25 - 34	842	758		470	538	496	413
35 - 44	1007	711		498	535	594	377
45 - 54	1053	862		524	567	735	548
55 - 64	912	556		383	569	670	455
65 - 74	594	447		479	209	398	373

Source: Computed from data reported by M.O.H., Cape Town, 1902-03 to 1951-52 and Censuses of 1904 to 1951.

(1) Age distribution of Non-European population not available.
(2) Population included comparatively large proportion of Natives.
(3) Rates of Coloured population only.

Sex and age variations in mortality from tuberculosis.

Information concerning the sex distribution of deaths from tuberculosis is provided in the annual reports of the Medical Officer of Health, Cape Town, only from 1925 onwards. It will be remembered also that the distribution of the Native population in 1951 is not

available, and the 1950-52 Non-European figures therefore refer to Coloureds only.

The sex and age specific mortality rates are shown in Table 84. The rates for 1925-27 and 1950-52 are presented graphically in Chart 13.

TABLE 84

AGE AND SEX SPECIFIC MORTALITY RATES FROM ALL FORMS OF TUBERCULOSIS. CAPE TOWN, 1925-27 TO 1950-52. (PER 100,000).

(a) EUROPEANS

Age Group	1925-27		1935-37		1945-47		1950-52	
	M.	F.	M.	F.	M.	F.	M.	F.
0 - 4	79	60	65	63	61	61	35	39
5 - 14	10	13	21	21	14	32	14	-
15 - 24	56	72	52	105	30	68	20	35
25 - 34	120	96	99	106	105	105	36	49
35 - 44	189	81	107	45	127	56	59	29
45 - 54	255	36	149	36	150	34	105	27
55 - 64	238	34	173	35	228	41	217	19
65 - 74	245	36	73	48	146	47	120	12
All ages	119	57	84	65	92	58	60	28

(b) NON-EUROPEANS

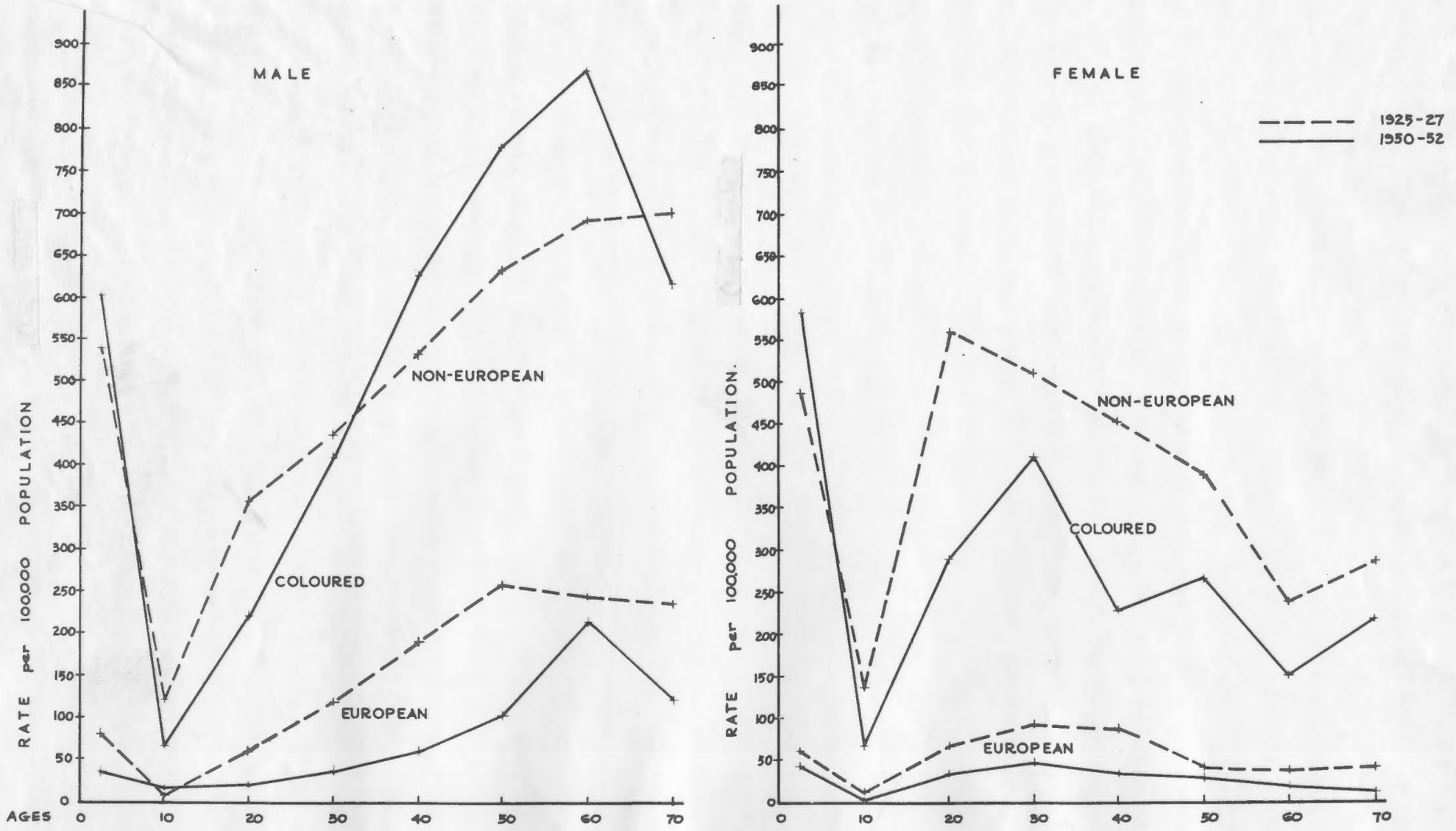
0 - 4	546	488	520	578	1139(+)	1071	604(x)	562
5 - 14	124	138	148	160	191	199	68	73
15 - 24	359	557	388	513	400	533	225	288
25 - 34	430	511	519	558	572	523	416	411
35 - 44	533	452	618	433	866	415	628	226
45 - 54	632	386	714	412	1289	386	784	266
55 - 64	693	235	784	345	1124	389	870	151
65 - 74	701	284	331	112	628	223	622	215
All ages	412	409	443	414	632	488	383	279

Sources: Computed from data in M.O.H., Cape Town, Annual Reports 1924-5 to 1951-2, and from Censuses of Union of South Africa for 1926, 1936, 1946 and 1951.

(+) Population included a comparatively large proportion of Natives.

(x) Rates for Coloured population only.

CHART 13.



MORTALITY RATES FROM ALL FORMS OF TUBERCULOSIS
(By race, sex and age.)
CAPE TOWN 1925-27 and 1950-52.

From Table 84 and Chart 13 it can be seen that:

1. The European rates for each age and sex group were considerably lower than those for the corresponding groups of Non-Europeans or Coloureds in each of the periods analysed.

2. There was a fairly consistent decline in mortality in each age and sex group among the Europeans from 1925-27 to 1950-52. This was most conspicuous between 1945-47 and 1950-52. Before this period there were frequent irregularities in the general downward trend which may have been partly or wholly due to the relatively small numbers of deaths involved.

For the Non-European population there was in general a rise in mortality rates for each age and sex group, especially in 1945-47 which may have been associated with the increase in the numbers of Natives in Cape Town. As the 1950-52 rates were for Coloureds only, these rates were not strictly comparable with those of earlier periods which were for all Non-Europeans.

However, in 1926 approximately 89 per cent of Non-Europeans in Cape Town were Coloured, and it is justifiable to draw comparisons between the Non-European rates for 1925-27 and those of Coloureds for 1950-52. It is apparent that the most consistent reductions occurred among females over the age of 5 years. For Coloured males the rates dropped only between the ages of 5 and 34.

3. There was a consistent difference in the way in which mortality varied with age in the two sexes. The pattern was generally the same in Europeans and Non-Europeans. In both sexes and races there were comparatively high rates in the age group 0 - 4 years, falling to a low level at 5 - 14 years and rising again thereafter. But whereas female rates reached a peak at the age group 25 - 34 followed by a fall, male rates continued to rise considerably and began to fall again only after the age of 65. In other words, male peaks were in early childhood and at about 60, and female peaks were in early childhood and at about 30, with a suggestion of a third peak for Coloured females in old age.

There is other evidence to suggest that tuberculosis increased among the Coloured population in 1945-47. For Coloured males in South Africa there was a decrease in the life expectation in 1945-47 as compared with 1935-37 for all groups excepting age 0 - 4 and ages above 76.

Females, on the other hand, showed an improvement up to age 39, after which the expectation was lower up to age 75. (U.G. 14/1951, p. xvi.) This decrease in life expectancy was attributed by the Director of Census and Statistics to the increase in mortality from tuberculosis among the Coloured population of South Africa.

It appears likely, therefore, that Coloured sex and age specific mortality rates (as well as those for Non-Europeans generally) in Cape Town increased from 1935-37 to 1945-47.

Since 1950-52 there have been considerable declines in mortality from tuberculosis in all races (see Tables 80 and 81), but the decline in age specific rates cannot be measured owing to the absence of data concerning the ages of the population at risk.

In practically every country for which statistics are published by the World Health Organization (World Health Organization, 1953), more males than females died of tuberculosis despite a constantly greater female mortality rate from this cause in young adult life.

The graphs of mortality rates for specific age groups of male and female Europeans and Coloureds in the Union of South Africa (U.G. 40/1954, Graphs B and C) are of a similar shape to those of the same groups in Cape Town, but the national levels are lower.

Comparison of the Cape Town graphs of mortality for tuberculosis in age groups with those for England and Wales given by McDonald and Springett (1954) is also of interest. Whereas the graph for Cape Town European males for 1925-27 corresponded fairly closely in contour and height with that of England and Wales for 1911-20, the former was considerably higher in the 1950-52 period, especially at the peak periods in early childhood and at 60 years. The curves for age specific mortality rates in 1950-52 for Coloured males reached much higher levels than those for England and Wales, even as far back as the 1851-1860 period.

The curves for European females in Cape Town corresponded fairly well with those for England and Wales in both the 1925-27 and the 1950-52 periods. The curve for Coloured females in Cape Town in 1925-27 was similar to that for England and Wales for females in 1851-60, both in contour and in height. By 1950-52 it was somewhat lower.

DISCUSSION.

Before the differences in tuberculosis mortality among Europeans and Non-Europeans can be seen in their proper perspective, it is necessary to review briefly our epidemiological knowledge of the disease.

History of tuberculosis.

Pulmonary tuberculosis was described by Hippocrates and spinal caries was observed in Egyptian mummies by Smith. (Topley and Wilson, 1948, p. 1291). In more modern times the disease appears to have been associated with industrialization, movements of population, and aggregations of poor people into slums, barracks, factories, asylums, etc. Singer (1928, p. 343), has described how in England the proportion of deaths which were due to tuberculosis rose during the Industrial Revolution from 1750 reaching a peak in 1800-50, and declining thereafter. It is noteworthy that the Cape Town sex and age mortality rates for Non-Europeans resemble those for England and Wales of a century ago.

Even before Koch in 1882 demonstrated that the essential cause of tuberculosis was a bacillus, there was a decline in mortality from this disease in some countries. This decline began about 1850 in England and Wales, and is now attributed to the improvement in social conditions (Hart and Wright, 1939, p. 126).

As mentioned previously, there has recently been a general reduction in mortality from tuberculosis. Since 1950 there has been a sharper decline in mortality which is considered to be due to the recent developments of more effective therapy. (McDonald and Springett, 1954).

In South Africa tuberculosis appears to have been introduced by European settlers, and it became prevalent among the Hottentots at the Cape in the latter half of the seventeenth century. Towards the end of the nineteenth century the South African climate acquired a reputation for the cure of "consumption" and large numbers of invalids migrated to the Colony. (Cluver, undated, p. 145). These patients not only swelled the numbers of deaths from tuberculosis at the Cape, but must also have been responsible for infecting large numbers of the local inhabitants.

Factors influencing mortality from tuberculosis.

The literature concerning the factors which influence tuberculosis mortality is vast, and it is unnecessary to discuss all that has been written on the subject, as it has been ably reviewed and summarised by such authors as Rich (1944) and McDougall (1949).

In a brief review of the evidence concerning factors influencing mortality from tuberculosis it is necessary to consider (a) the causative agent, (b) the environment affecting the development and spread of the disease, and (c) factors affecting the resistance or susceptibility of the host. These include not only genetic and physiological influences, but also such features as housing, occupation, nutrition, fatigue, and the availability and use of social (including medical) services.

The broadening modern concept of the multiple aetiology of disease expounded by Ryle (1942), Brock (1948) and Leavell and Clark (1953) is clearly illustrated by the numerous interacting factors now known to play a part in the pathogenesis of tuberculosis. These influences can most conveniently be grouped under the headings of (a) biological factors, and (b) social factors.

(a) Biological factors.

It is theoretically possible that a change in the virulence of the infecting organism may have contributed to the decline in the mortality from tuberculosis. There is no evidence that this has been the case in Europe (McDonald and Springett, 1954), and we should therefore rather seek other explanations for the variations in mortality which have been observed in various communities. Moreover, it seems unlikely that the great differences in European and Coloured mortality from tuberculosis in Cape Town could be attributed to variations in virulence of the causative organism, especially as there must have been much sharing and exchanging of tubercle bacilli during the past three centuries at the Cape.

One interesting difference between the bacteriology of tuberculosis in Cape Town as compared with the findings in Europe is reported by Coetzee (1953). He found only 1 per cent of 200 cases of tuberculous meningitis in Non-European children in the neighbourhood of Cape Town to be due to tubercle bacilli of the bovine strain. This contrasted

markedly with results of similar investigations in Britain where the percentage of bovine strains ranged from 3.3 to 28. The small Cape Town rate was possibly due to the low consumption of milk by Non-European children.

Genetic variations in resistance.

Much emphasis was laid in the past on the easily observed familial and racial incidence of tuberculosis. Only in more recent years has it been stressed that families and racial groups share not only their genetic make-up, but frequently also their housing, diet, opportunities for infection, and other environmental conditions.

Nevertheless, there is evidence to support the thesis that there are genetic influences in the variability in incidence as seen in different individuals, families or racial groups.

It seems reasonable to assume that, by a process of natural selection, populations which have been exposed to infection for many generations would develop greater inborn resistance to the disease by the elimination of susceptible members. This would to some extent account for the high mortality from tuberculosis observed among communities only recently exposed to civilization and infection. (Topley and Wilson, 1948, p. 1296-7). It is likely, too, that the migration of rural people to industrial cities caused heavy casualties from tuberculosis among people who have not previously been infected, especially when living under adverse urban conditions.

Dormer et al (1943) and Van Riel (1953) were of the opinion that the high tuberculosis mortality among Natives in Africa was more dependent upon crowding, malnutrition and unaccustomed hard work than upon immunological factors.

The studies reported by Kallmann and Reisner (1943) provide strong evidence of genetic variation in resistance to tuberculosis. In 308 twin pairs they found that monozygotic twin partners were 3.5 times as likely as dizygotic twin partners to develop tuberculosis if the co-twin had the disease. Dizygotic co-twins had only the same chance of developing the disease as ordinary full-siblings if the other twin had tuberculosis.

There is therefore sound scientific evidence for suggesting

that a part of the inter-racial differences in mortality from tuberculosis in Cape Town may be due to genetically determined variations in susceptibility.

The relationship between heredity and environment is aptly summed up by Crew (1946) in the following words:
"If, for example, in the aetiology of a condition such as tuberculosis there is a combination of genetic proneness and an environmental provocation, the latter being a configuration of the bacillus together with a variety of unsatisfactory social conditions, then by controlling and removing the latter the former must lose all its significance".

Age, sex and susceptibility.

The peculiar and consistently different graphs of mortality for males and females at various ages suggests that there are biological factors at work which increase the susceptibility of females at puberty, and for some years thereafter. These may be due to the physiological strains of puberty and childbearing at this age. However, the continued rise in mortality rates among men in later years may well be due to occupational differences. (McDonald and Springett, 1954).

It can be assumed that in general the environment of male infants is no different from that of female infants. It is tempting to postulate that the higher mortality from tuberculosis among males in the age groups under the age of five years denotes a biological difference in male and female susceptibility to tuberculosis. However, the infant mortality rate for males from most causes is always higher than that for females, and it therefore seems more likely that the higher tuberculosis mortality in males at this age is due to a lower resistance to infection generally in the male, and not to tuberculosis specifically.

(b) Social factors.

The close association between tuberculosis and poverty has been recognised for many years. Not only does tuberculosis lead to poverty, but poverty subjects people to a variety of circumstances which predispose to the spread and development of this disease. The recognition that only a fraction of those infected with the tubercle bacillus develop the disease, and that only some of those who become ill eventually die, has stressed the multiple aetiology of tuberculosis.

War conditions and tuberculosis.

The sensitivity of the tuberculosis mortality rate as an index of social conditions is well illustrated by the rise of the rate in most countries under conditions of war. Cobbett (1930) discussing the general rise of mortality from pulmonary tuberculosis during World War I, showed that the rise amounted to 60 to 70 per cent in countries like Germany, but that an increase occurred in non-belligerent countries too. He attributed the greater incidence, which fell sharply after the war, to lack of food and to disturbance of industrial conditions. Daniels (1949) reviewed the tuberculosis mortality rate in Europe during World War II. He came to three main conclusions: (i) The rise in mortality was closely related in each country to the time, sequence, and severity of disorganization of social conditions (including health services). (ii) The rise predominated in men. (iii) In nearly all European countries there was an important decline in mortality within four years of the end of the war.

Rakower (1953) reported that prior to 1939, Jews in Poland, as in most other countries, had a lower tuberculosis mortality rate than Non-Jews. Under extremely adverse social conditions, such as prevailed for Jews in Warsaw during the war, their high resistance broke down, and tuberculosis mortality among them increased 8.5 times, whereas among the non-Jewish population it increased 2.3 times.

In Cape Town during the years of World War II the tuberculosis mortality of Europeans remained fairly constant, but among the Non-Europeans it rose considerably. This rise could naturally have been due only indirectly to war conditions. It is noteworthy that even in cities with the highest wartime tuberculosis mortality rates such as Warsaw (Daniels, 1949), the rate never rose above 500 per 100,000, whereas the death rate for Coloureds in Cape Town during the same years rose to 612.

Socio-economic conditions and tuberculosis.

The complex of poverty is most easily measured by income level, and a number of studies have related low economic status to high mortality from tuberculosis.

Sydenstricker (1933) summarized the studies which had previously

related tuberculosis to poverty, and showed that there was an inverse relationship between income and mortality from this cause. (P. 106).

Hart and Wright (1939) investigated the relationship between the incidence of pulmonary tuberculosis and social conditions in England and Wales. They showed that the decline in mortality from 1850 onwards was associated with a rise in "real earnings". When the improvement in the latter slowed down in the early part of this century, there was also a retardation in the decline of mortality among young adults. They suggested that the mortality of young adults, especially of females, was very sensitive to changes in the standard of living. (P. 107).

Other evidence of the relationship of socio-economic status and tuberculosis is provided by the occupational mortality statistics of the Registrar-General of Great Britain (1954).

TABLE 85

STANDARDISED MORTALITY RATIOS BY SOCIAL CLASS FROM RESPIRATORY TUBERCULOSIS IN ENGLAND AND WALES.

	YEARS	SOCIAL CLASS I	II	III	IV	V
(a) Men aged 20-64	1921-23	49	81	95	97	137
	1930-32	61	70	100	104	125
	1950	64	62	103	95	149
(b) Married women aged 20—64	1930-32	52	67	99	106	132
	1950	43	52	104	107	166
(c) Infants under 1 year (+)	1950	-	33	94	122	200

(+) Infant mortality rate from all forms of tuberculosis expressed as percentage of rate for all classes.

Source: Great Britain, Registrar-General (1954), Tables 5, 11 and VIII.F.

Table 85 shows that mortality from respiratory tuberculosis in adult males and females, and all forms of tuberculosis in infants, is closely related to social classes as determined by occupation of the head of the family, even though the gradient for adult men became rather irregular in 1950.

Indices such as "real earnings","standard of living", "income group", "social class", etc., do not provide us with any indication of the relative aetiological importance of such elements in the poverty complex such as occupational factors, nutrition, housing, ignorance and lack of medical care. In recent years attempts are being made to evaluate these factors with a greater degree of exactness.

In Cape Town there is ample evidence that socio-economic conditions among the Coloured section of the population generally have been, and are, considerably worse than those among the Europeans.

Even among the Europeans in Cape Town there are marked differences in mortality rates from tuberculosis among the 15 various wards of the city. Table 86 compares the four wards with the lowest average European mortality rates for the nine years 1944-45 to 1952-53 with the four wards with the highest average rates during that time.

T A B L E 86

EUROPEAN MORTALITY FROM TUBERCULOSIS IN BEST AND WORST WARDS OF CAPE TOWN. 1944-45 TO 1952-53.

	Total T.B. Deaths	Estimated Population	Average Annual Rate
Four best wards:			
No. 1, 4, 11 and 12	168	55,550	33.6 (+)
Four worst wards:			
No. 7, 8, 9 and 10	361	52,891	75.8 (+)

(+) The difference between these two rates, 42.2 per 100,000, is highly significant.

Source: Computed from data in Medical Officer of Health, Cape Town, Annual Reports 1944-45 to 1952-53.

This significant difference between the best and worst wards of the City as regards tuberculosis mortality rates among Europeans is all the more striking because these wards are by no means homogeneous socially. It also lessens the weight of the racial or genetic factor in explaining the difference in tuberculosis mortality rates of Europeans and Non-Europeans in Cape Town.

Occupation and tuberculosis.

The occupation of individuals can be related to tuberculosis

mortality in several ways:-

(i) The occupation may be associated with specific hazards which are known to predispose to tuberculosis, e.g. gold mining, metal grinding, etc.

(ii) The occupation may be associated with conditions which increase risks of exposure to infection. Stewart and Hughes (1949) found that in the boot and shoe manufacturing industry the incidence of active tuberculosis was higher among men who worked in bigger, as opposed to smaller, workshops and factories. They concluded that in the bigger groups there were greater risks of infection. Stewart (1953) also emphasized that the occupation may be such as to attract the less robust workers and thus be associated with a high tuberculosis mortality.

Dahlberg (1949), in drawing attention to the fact that high mortality rates for males in middle age occurred in urbanized communities, attributed the difference between male and female mortality in these age groups to the greater exposure of working men to infection in industrial work.

(iii) The occupation may produce marked fatigue in the worker. Dormer et al (1943) were of the opinion that in Bantu workmen, who were used to the relative inactivity of rural life, the unaccustomed heavy effort of industrial labour, fatigue (combined with undernutrition) was a potent predisposing factor in the production of tuberculosis.

(iv) The occupation may be associated with poor socio-economic conditions. The Registrar-General's figures for the mortality from tuberculosis not only for adult men, but also for their wives and infants (Table 85) provide strong evidence that this is a potent factor in relating occupation and tuberculosis mortality.

With the exception of (i) above, it is likely that all of the occupational disadvantages mentioned operate against the Coloured population of Cape Town.

Housing and tuberculosis mortality.

There is some evidence that bad housing conditions per se can predispose to a high tuberculosis mortality rate.

Hart and Wright (1939, p. 119-120) found that of the indices of poverty which they used, substandard housing showed the strongest

correlation with the incidence of pulmonary tuberculosis. This applied to both sexes, and to all ages below 45 years. The association remained highly significant when the other two social measures, "social index" and "poor relief incidence", were held constant, either separately or together, by partial correlation.

In a more recent study, Stein (1952) concluded that respiratory tuberculosis in Glasgow showed strong and highly significant associations with several social variables. These associations were not equal in magnitude, and some varied with time. The high correlations with crowding were greater than those with unemployment or poverty.

The markedly inferior housing of Non-Europeans as compared with that for Europeans in Cape Town has already been discussed. It seems that poor housing conditions play a large part in producing the high mortality from tuberculosis in Non-Europeans, even though there are no means of proving this. The differences in tuberculosis mortality seen in Natives living inside and outside the Langa Housing Scheme cannot be used to demonstrate the effect of housing on the disease because of the unreliability of the data, and because there are probably other social variables to be reckoned with in making such a comparison.

Nutrition.

Although numerous authors have assumed that war, poverty, and generally adverse social conditions exert their influence on tuberculosis largely through malnutrition, there is little or no direct scientific evidence to prove that malnutrition in humans leads to a lowering of resistance to the disease. While there is no doubt that malnutrition is usually an important concomitant of a low income, the fact remains that poverty is generally also accompanied by unhygienic conditions, poor housing, hard physical work, exposure to cold, inadequate medical care, etc., which makes it difficult to assess the influence of nutrition *per se* on the tuberculosis mortality rate.

The literature on this subject prior to 1944 was extensively reviewed by Rich (1944, pp. 610 et seq). He referred to the fact that the levels of tuberculosis mortality during World War I in England, Germany and Denmark, and in Germany during the financial crisis in 1922, closely paralleled the availability of food, but stressed that other

social factors were also operating at the same time especially during the war.

There is little scientific evidence also concerning the importance of various elements in the diet in relation to resistance to tuberculosis. Various authors such as Dubos and Pierce (1948) and Sengupta and Howie (1949) have reported on the effects of various diets in experimental animals on susceptibility to infection with the tubercle bacillus. These and other experiments strongly suggest that diet affects the resistance of laboratory animals to tuberculosis, and supports the strong circumstantial evidence that nutrition is a most important factor in determining susceptibility to tuberculosis.

The marked differences in economic status between Europeans and Coloureds in Cape Town have been mentioned. The nutritional state of Coloured and Non-European people in the city was of a lower level than that of the Europeans, and this factor presumably played an important part in producing the inter-racial differences in mortality from tuberculosis.

Availability and utilization of medical services.

Mention has previously been made of the inadequacy of hospital facilities for Non-Europeans in Cape Town. A similar state of affairs applied to accommodation for patients suffering from tuberculosis.

Statistics concerning the numbers of tuberculosis patients who were notified, who died, and who were admitted to hospital in two recent periods are given in Table 87.

TABLE 87.

NOTIFICATIONS, DEATHS AND ADMISSIONS TO HOSPITAL OF TUBERCULOSIS PATIENTS BY RACE, CAPE TOWN. 1944-45 TO 1946-47 AND 1949-50 TO 1951-52.

	NOTIFICATIONS			DEATHS			ADMISSIONS		
	Eur. (a)	N-E. (b)	Ratio b/a	Eur. (c)	N-E. (d)	Ratio d/c	Eur. (e)	N-E. (f)	Ratio f/e
1944-45 to 1946-47	694	4556	6.6	344	2611	7.6	629	1940	3.1
1949-50 to 1951-52	733	4486	6.1	206	2095	10.2	958	1943	2.0

Source: M.O.H., Cape Town, 1944-45 to 1951-52.

From these figures it is apparent in the two periods reviewed that although two or three times as many Non-European as European patients were admitted to hospital, there were six to seven times as many notifications and seven to ten times as many deaths amongst the former group.

It can also be seen that for Europeans the numbers of admissions and notifications were approximately equal. But for Non-Europeans there were approximately 2.4 notifications per admission. In addition, Non-Europeans are at a disadvantage with regard to housing, nutrition, ability to afford private medical care and other social and economic factors, all of which made hospital admission more necessary.

It is evident that there have been far too few beds for Non-Europeans suffering from tuberculosis. Much of the higher tuberculosis incidence and mortality among the Non-Europeans must be attributed to the failure of the authorities to provide adequate facilities for the isolation and treatment of cases.

The attitude of tuberculotic patients to treatment is also of great importance. Members of various public health clinics often complain that Non-European tuberculotics generally are rather uncooperative, and frequently do not enter hospital even when a bed is obtained for them. In the author's experience with patients attending a health centre, most of these refusals can be fairly easily explained. Often the patient is afraid of the economic consequences of being kept away from his work, and believes that disability grants and other public allowances will not provide adequately for his dependants. The housewife is often anxious about the fate of her children and home if she is to be admitted to hospital for a long period. Such patients tend to "hope for the best", and place their faith in home remedies, or mixtures bought over the counter.

Frequently Non-European patients ascribe their illnesses to supernatural influences and feel that European doctors do not understand their disease. Considering their differences in cultural background, this is not surprising. The fact that until recently the prognosis for Non-European tuberculosis was so very poor, even when the patient remained in hospital for long periods, added to the difficulties.

With the improvement in the efficacy of modern therapy, an increasing proportion of Non-European patients is willing to accept medical treatment in hospital. However, many Non-European patients are still unwilling to accept the diagnosis of tuberculosis because of emotional resistance resulting from fears engendered by previous experience of others who were similarly diagnosed. Even among Europeans the diagnosis of tuberculosis is often regarded as a stigma and euphemistically referred to as a "spot on the lung".

It is therefore to be expected that many patients who suffer the social, economic and cultural disadvantages of the Non-Europeans, are not always eager to accept the advice given them by well-meaning doctors or nurses.

2. DIARRHOEA AND ENTERITIS.

For many years "diarrhoea and enteritis" was the third most frequent cause of death among Non-Europeans in Cape Town, being exceeded only by "tuberculosis" and "bronchitis and pneumonia". After 1950 these latter causes became less important, and since 1952-53 "diarrhoea and enteritis" has moved into first place. Among the European population it has been a relatively unimportant cause of death for many years.

The mean death rates from gastro-enteritis for all ages for the ten years 1943-1953 for Europeans and Non-Europeans were 15 and 242 per 100,000 respectively. (M.O.H., Cape Town, 1953-54).

The Non-European mortality rate was thus over sixteen times as great as that of the Europeans, and no other cause of death of numerical importance had such a high interracial ratio. The mortality rates of tuberculosis and of bronchitis and pneumonia, two commonly cited "social diseases", for the same period had ratios of 8.1 and 5.7 respectively. It appears, therefore, that mortality rates from diarrhoea and enteritis provide a most sensitive index of social conditions.

Diarrhoea and enteritis in infants in the first year of life.

Diarrhoea and enteritis is a cause of death mainly among infants. The high death rate from this cause among Non-Europeans is partially an expression of the high birth rate among this section of

the population. It is therefore necessary to refine the crude mortality rate by relating deaths of infants from diarrhoea and enteritis in each racial group to the number of persons in the age group concerned. The simplest method of doing so is to relate infant deaths from this cause to the number of live births in each group as shown in Table 88.

TABLE 88

INFANT MORTALITY FROM DIARRHOEA AND ENTERITIS, CAPE TOWN. 1914-15 TO 1953-54.

	LIVE BIRTHS		MORTALITY RATE PER 1,000 LIVE BIRTHS	
	Eur.	Non-E.	Eur.	Non-E.
1914 - 19	11754	16732	29.3	58.3
1919 - 24	12386	20966	26.1	54.8
1924 - 29	13477	26010	18.9	55.2
1929 - 34	14006	31378	13.6	40.8
1934 - 39	13734	33891	6.7	31.3
1939 - 44	16574	35949	7.0	38.8
1944 - 49	18563	43240	4.2	30.1
1949 - 54	17174	50725	3.0	38.0

Source: M.O.H., Cape Town, 1914-15 to 1953-54.

From this table it can be seen that the infant mortality rate from diarrhoea and enteritis declined for both racial groups in the period 1914 to 1954. When the first and the last quinquennia are compared, the decline in the rate for Europeans was 89.8 per cent, while that for Non-Europeans only 34.8 per cent.

In the period 1914 to 1919 the Non-European rate was approximately twice as great as that of the Europeans. By the last quinquennium it was 12.7 times as great because of the relatively larger decline in the European rate. If the Non-European rate had been as low as the European in this period, about 1,750 infant deaths would have been avoided.

A comparison of the rates for the four racial groups in the period 1949 to 1954 is shown in Table 89.

It is evident that the infant mortality rate from diarrhoea and enteritis in this period was considerably lower for Coloureds than

for Non-Europeans generally. The rates for Natives were much higher than those of the other Non-European groups. The rate for Natives living in Langa Township was considerably lower than that for Natives living mainly in slums and shacks elsewhere in the city. As pointed out in an earlier section of this study, however, there is evidence which strongly suggests that the registration of Native births in Cape Town is far from complete, and the various infant mortality rates for this group are probably a considerable overstatement of what has actually occurred. This applies less to Natives living in a controlled Municipal housing scheme like Langa. It is likely that though under-registration of births accounts for a part of these differences, variations in social and hygienic conditions are also important factors.

TABLE 89

INFANT MORTALITY FROM DIARRHOEA AND ENTERITIS BY RACIAL GROUPS, CAPE TOWN, 1949-50 TO 1953-54.

Racial group	Live births	Deaths from diarrhoea and enteritis	
		Number	Rate/1,000 live births
EUROPEANS	17,174	49	2.8
NON-EUROPEANS+	50,725	1,918	37.8
Coloureds	43,867	1,315	30.0
Natives+	5,173	582	112.5
Asiatics	1,685	21	12.4
Langa Natives	839	56	66.7

\+ Excluding Natives living in Langa.

Source: M.O.H., Cape Town, 1949-50 to 1953-54.

Asiatic and Coloured births are probably registered more completely than those of Natives, and the Asiatic and Coloured infant mortality rates from diarrhoea and enteritis are therefore more reliable.

The rate for Non-Europeans as a whole from 1914 to 1919 (58.3 per 1,000 live births) was probably very close to that of the Coloured people who formed the great majority of the group during that period. For 1949 to 1954 the rate for Coloured infants was 30.0 per 1,000.

If this figure is compared with the Non-European rate for the

first quinquennium of the period under review, the decline in the rate from diarrhoea and enteritis is then 48.5 per cent, which is still considerably less than that for Europeans in the same period.

Diarrhoea and enteritis in infants in the second year of life.

An even greater disparity between European and Non-European mortality rates from diarrhoea and enteritis is seen in the age group 1 to 2 years. (Table 90).

TABLE 90.

AVERAGE ANNUAL MORTALITY FROM DIARRHOEA AND ENTERITIS INFANTS 1 TO 2 YEARS OF AGE - CAPE TOWN.

Quinquennium	RATE PER 1,000	
	European	Non-European
1924 - 1929	5.1	30.6
1929 - 1934	3.2	21.4
1934 - 1939	1.8	15.9
1939 - 1944	2.6	20.3
1944 - 1949	0.7	14.4
1949 - 1954	0.7	16.3

Source: M.O.H., Cape Town, 1953 - 54. Adapted from Table L in which the annual rate is calculated on the births (less the deaths under one year) in the previous year.

Diarrhoea and enteritis, though more important as a cause of death in the first year of life, remained of considerable significance even in the second year of life for Non-Europeans. For Europeans it was far less important. In both racial groups the mortality rates have decreased considerably in the 30 years under review, but the decrease has been relatively greater among Europeans.

In Cape Town diarrhoea and enteritis is more frequent in the summer. The seasonal variation in mortality from this disease is revealed by Table 91.

In each month the average number of deaths among Non-Europeans was higher than that among Europeans. In both racial groups there were considerably more deaths in the summer and autumn than in winter and spring, but the seasonal variability was less marked among the Europeans.

TABLE 91

AVERAGE WEEKLY DEATHS FROM DIARRHOEA AND ENTERITIS
INFANTS 0 TO 2 YEARS OF AGE, CAPE TOWN.
1949-50 TO 1953-54

	AVERAGE DEATHS PER WEEK	
	Europeans	Non-Europeans
JULY	0.3	5.7
AUGUST	0.2	4.0
SEPTEMBER	0.1	3.4
OCTOBER	0.1	4.1
NOVEMBER	0.1	8.4
DECEMBER	0.4	14.1
JANUARY	0.7	21.7
FEBRUARY	0.4	20.9
MARCH	0.4	15.1
APRIL	0.4	12.6
MAY	0.2	12.2
JUNE	0.5	9.1

Source: M.O.H., Cape Town, 1949-50 to 1953-54.

Comparison with other populations.

In all modern communities infant mortality from diarrhoea and enteritis has declined rapidly in the past half century.

An indication of the extent of this decline in the Administrative County of London is given by Table 92.

TABLE 92

AVERAGE ANNUAL MORTALITY OF INFANTS AGED 0-2 YEARS
FROM DIARRHOEA AND ENTERITIS.
ADMINISTRATIVE COUNTY OF LONDON.

	RATE PER 1,000 LIVE BIRTHS
1891 - 95	23.8
1896 - 1900	41.3
1901 - 05	30.4
1906 - 10	23.8
1911 - 15	28.0
1916 - 20	15.4
1921 - 25	11.7
1925 - 30	10.2
1931 - 35	11.6
1936 - 40	10.9
1941 - 45	8.0
1946 - 50	2.8

Source: London County Council, 1952, Table 3.

The London rates refer to infants aged 0 - 2 years, but as the majority of infant deaths from this cause occur in the first year of life, they can be used as a basis for comparison with the Cape Town

rates of approximately the same period. The London rates have been on a lower level than even the Cape Town European rates, despite the fact that the former have included infants 1 - 2 years of age, and include all social classes of the population. Even in the most recent years the Cape Town European rates have been somewhat higher.

DISCUSSION.

Topley and Wilson (1946, p. 1580) in discussing the aetiology of enteritis in infancy, point out that "Though some cases are certainly infective and others are almost certainly not, there is a substantial modicum of cases between these two extremes that cannot be assigned with any assurance to one or other group." These authors divide the causes of the infective enteritides of infancy into six groups, but admit that our knowledge of the causative factors is very incomplete.

In addition to the infective causes, it is known that improper feeding or underfeeding, may cause diarrhoea in infants and may prove fatal. Because of the proneness of infants to develop diarrhoea as a result of constitutional upsets, many serious conditions are accompanied by a terminal diarrhoea. This may result in "enteritis" being given as the certified cause of death.

It is obvious that "diarrhoea and enteritis" is not really a disease, but rather a symptom which may result from one or more of several factors.

Mortality from diarrhoea and enteritis used to have a marked seasonal variation in England and Wales, being highest in the hot months of the year, but since 1921 it has lost this tendency. (Topley and Wilson, 1946, p. 1582). It is not established whether warm weather acts only by favouring the growth of organisms e.g. in milk, or whether it in addition lowers the resistance of the host by upsetting the fluid and electrolyte balance through excessive perspiration. Probably this dehydration serves merely to increase the severity of the illness. The available evidence suggests that malnutrition is a factor predisposing to diarrhoeal disease, but impressive factual data are not available to establish this point. (Holt and McIntosh, 1953, p. 245).

Several studies have shown that infantile diarrhoea was

commoner among artificially fed than among breast fed babies. Grulee, Sanford and Schwartz (1935) analysed morbidity and mortality statistics relating to 20,000 infants in Chicago and found gastro-intestinal disorders considerably higher among those artificially fed. Robinson (1951) in Britain found a similar relationship between methods of infant feeding and diarrhoeal disease.

However, it does not constitute a fair trial to compare breast fed with artificially fed infants in this way. It is highly probable that many of the latter group included a number of infants who were weaned because they were not thriving, and therefore started at a disadvantage. On theoretical grounds, however, breast milk is superior in that it is more easily digested than artificial feeds and is not subject to the same dangers of contamination by dirty bottles and hands, and by flies. In the case of ignorant mothers there is the additional danger that nutritionally unsuitable preparations will be given to their babies. When, however, artificial feeding is carried out under ideal conditions, Stevenson (1947) showed that there was no increased susceptibility of artificially fed infants to diarrhoea.

Social class differences in infant mortality from gastro-enteritis are revealed by the Registrar-General's statistics on occupational mortality for England and Wales. (Table 93).

TABLE 93

INFANT MORTALITY RATES PER 1,000 LIVE BIRTHS FROM GASTRO-ENTERITIS. ENGLAND AND WALES - BY SOCIAL CLASS OF FATHER.

	SOCIAL CLASS					ALL CLASSES
	I	II	III	IV	V	
1921	4.2	7.7	12.4	14.8	18.5	13.1
1930-32	2.0	2.6	4.6	5.4	7.9	5.2
1950	0.5	0.7	1.5	2.1	3.0	1.7

Source: Great Britain, Registrar-General (1954). Table 23.

It can be seen that social class differences in infant mortality have been considerable, and that the gradient between the classes has remained practically unchanged over the years between 1921 and 1950. But even in social class V, which consists of unskilled workers and

their families, the decline has been 84 per cent during that period.

Of several papers dealing with the social background of enteritis in infancy, only three recent ones will be quoted relating faulty environment to the development of this group of diseases.

Krige (1952) investigated the social background of children admitted to King Edward Hospital, Durban, during 1950. She concluded that "Migrant labour with its accompanying social evils and poverty provided the background and setting of the problem. Important causal factors were illegitimacy, full time employment of mothers with subsequent inadequate feeding and care of infants, disorganization in the home, lack of available protective foods and, to a lesser extent, ignorance of the value of different European foods". Although these remarks refer to Natives living in Durban, there is no reason to believe that they do not apply equally well to those living in Cape Town, and to a lesser extent to the Coloured population.

Scott (1953) reported an investigation into gastro-enteritis in infancy in a London hospital. He concluded that a reduction in the incidence of enteritis might be expected from (i) improvement in housing, directed particularly towards avoiding the sharing of sanitary and kitchen accommodation, (ii) increasing the maintenance of breast feeding, (iii) education on the hygiene of preparation of bottle feeds, and (iv) treatment as a priority class by health visitors of families with poor health records.

In their study of 1,000 infants born in Newcastle-upon-Tyne in the months of May and June, 1947, Spence et al (1954) kept continuous records of both the health of the infants and their environment. They found that infants in lower social classes had significantly more attacks of infective diarrhoea and vomiting than did infants in the upper social classes. Infants of mothers whose standards of maternal care were unsatisfactory had significantly more attacks than those of mothers whose standards were satisfactory. They found no significant differences as regards frequency of infective enteritis among infants who lived in overcrowded or structurally inadequate houses, as compared with infants living under better housing conditions. (Pp.194-5).
Of the three infants who died during the first year of life with the

diagnosis "gastro-enteritis" the authors wrote that "in none were the social conditions satisfactory, and in two cases the care of the children was so bad that it almost amounted to neglect". (P. 37).

Infant mortality rates from diarrhoea and enteritis among the European population in Cape Town have followed trends similar to those for London. Although on the average Cape Town's Europeans enjoy greater socio-economic advantages than the Londoners do, it is likely that a warmer climate plays a part in facilitating the spread and increasing the severity of infective enteritis in infants. The persistence in Cape Town of a seasonal variation in mortality from this cause of infant deaths, despite its disappearance in England and Wales (Topley and Wilson, 1946, p. 1582), suggests that climatic factors have played a part in delaying the decline in mortality rates. Climate may also be of importance in producing the great disparity between Europeans and Non-Europeans as regards infant mortality from diarrhoea and enteritis. Since the health of infants depends largely upon freedom from infection a warm atmosphere is potentially more dangerous in homes where contamination of food is less easily avoided and controlled.

In the control of infective diarrhoea and enteritis the introduction of pausterized and powdered milk, refrigeration and other forms of food protection, and the reduction of fly breeding have all been of paramount importance. The dissemination of knowledge concerning the adequate feeding of infants has lessened the incidence of nutritional diarrhoea. The recent improvements in the management of babies suffering from various forms of diarrhoea have greatly improved their prognosis.

Europeans in Cape Town have benefited more from these advances, but improvements in the standards of living would undoubtedly bring about a marked reduction in infant mortality rates from diarrhoea and enteritis among the Non-Europeans.

3. ENTERIC FEVER.

The incidence of enteric fever has for a long time been regarded as an index of the sanitary state of the community. In all modern communities there has been a steady decline in the incidence of and mortality from the disease. In urban populations to-day the

maintenance of sanitary control together with recent improvements in therapy have practically removed enteric fever from the list of causes of death.

Enteric fever is an example of a preventable disease in which the greatest part of its control in cities depends on the effectiveness of governmental action in improving sanitation. The people themselves have relatively little responsibility - unlike the prevention of diphtheria, syphilis, most causes of infant mortality, etc., where personal knowledge and effort on the part of the population are required for the prevention of disease. It is interesting, therefore, to compare the decline of mortality from this disease in the two sections of the population of Cape Town. The incidence and mortality rates from enteric fever among Europeans and Non-Europeans are shown in Table 94.

TABLE 94

INCIDENCE OF AND MORTALITY FROM ENTERIC FEVER, CAPE TOWN, 1914-15 TO 1953-54. (RATES PER 100,000)

QUIN-QUENNIUM	EUROPEANS			NON-EUROPEANS		
	Notifications (corrected)	Notification Rate	Death Rate	Notifications (corrected)	Notification Rate	Death Rate
1914-19	918	215	15	815	210	38
1919-24	1101	217	22	951	229	44
1924-29	492	82	9	552	108	22
1929-34	337	49	5	372	60	12
1934-39	169	22	2	266	37	6
1939-44	189	23	1	258	31	5
1944-49	115	13	3	415	41	7
1949-54	74	8	-	273	22	2

Source: Calculated from data given by M.O.H., Cape Town, 1914-15 to 1953-54

From this table it can be seen that although the incidence was about the same in the two main racial groups in 1914-24, the mortality rate was much higher among the Non-Europeans. After 1924 the incidence fell in both groups, but more rapidly among the Europeans, which is a reflection of the differential domestic sanitation of the two groups. The case mortality rate (ratio of fatal cases to total cases) was higher

among the Non-Europeans too, suggesting that they had poorer resistance than the Europeans had, or that only the more severe of their cases were notified, or that their patients received medical treatment late. It is probable, from what we know about socio-economic conditions in Cape Town, that all three factors played a part in producing the difference. As enteric fever runs a variable course, and many infections occur without any clinical signs of disease, it is likely that a larger proportion of cases was missed among the poorer, less educated sections of the population.

It is of interest to note that only in 1949-54 did the enteric mortality rate of Europeans in Cape Town reach levels as low as those in London and other western cities. The Administrative County of London in 1921-30 had an enteric mortality rate of 1 per 100,000, and since 1930 the rate has been less than 1. (London County Council, 1952, Table 3).

It can be seen that in a disease due primarily to insanitary conditions the Non-Europeans suffered higher morbidity and mortality rates than the Europeans did. As sanitary conditions improved the European rates declined more rapidly. It is likely that such factors as the more primitive sanitary facilities available to Non-Europeans generally, aggravated by lack of personal hygiene, was largely responsible for this difference.

In reports of the Medical Officer of Health on enteric fever, mention is made of the squalor, overcrowding, absence of suitable latrines and the general lack of hygiene in the homes of the cases investigated. Considering how widespread such conditions are in many areas of the city, it is surprising that major epidemics of this disease do not occur.

4. CANCER.

Europeans in Cape Town have a much higher crude mortality rate from all forms of cancer than do Non-Europeans. The mean death rates from this cause for the ten years 1943 - 1953 were:

Europeans	155 per 100,000.
Non-Europeans	79 per 100,000.

For Europeans cancer was the second, and for Non-Europeans the seventh in importance as a group of causes of death in the same period.

The classification of cancer as a cause of death used by the Medical Officer of Health, Cape Town, has not changed from 1935 to 1953, and is based on the 1938 Revision of the International List of Causes of Death. From this point of view there are thus no difficulties in comparing the racial differences in mortality from cancer in this period. There may, however, have been changes in the accuracy with which the diagnosis was made which may have affected Europeans and Non-Europeans to different degrees. It will beremembered that Non-European deaths were not reported in separate races in 1935-37, and that in 1945-47 Non-European deaths which occurred in Windermere were also not so separated. The age and sex distribution of the Native population at the time of the 1951 census is not available. Consequently the age specific mortality rates from cancer which are based on data from the annual reports of the Medical Officer of Health, Cape Town, and the censuses of 1936, 1946 and 1951, refer to all Non-Europeans in the first two periods, and to Coloureds only in the last of the three periods investigated.

The age and sex specific mortality rates from cancer of all sites for Europeans and Non-Europeans in Cape Town in 1935-37, 1945-47 and 1950-52 are shown in Table 95 and illustrated in Chart 14.

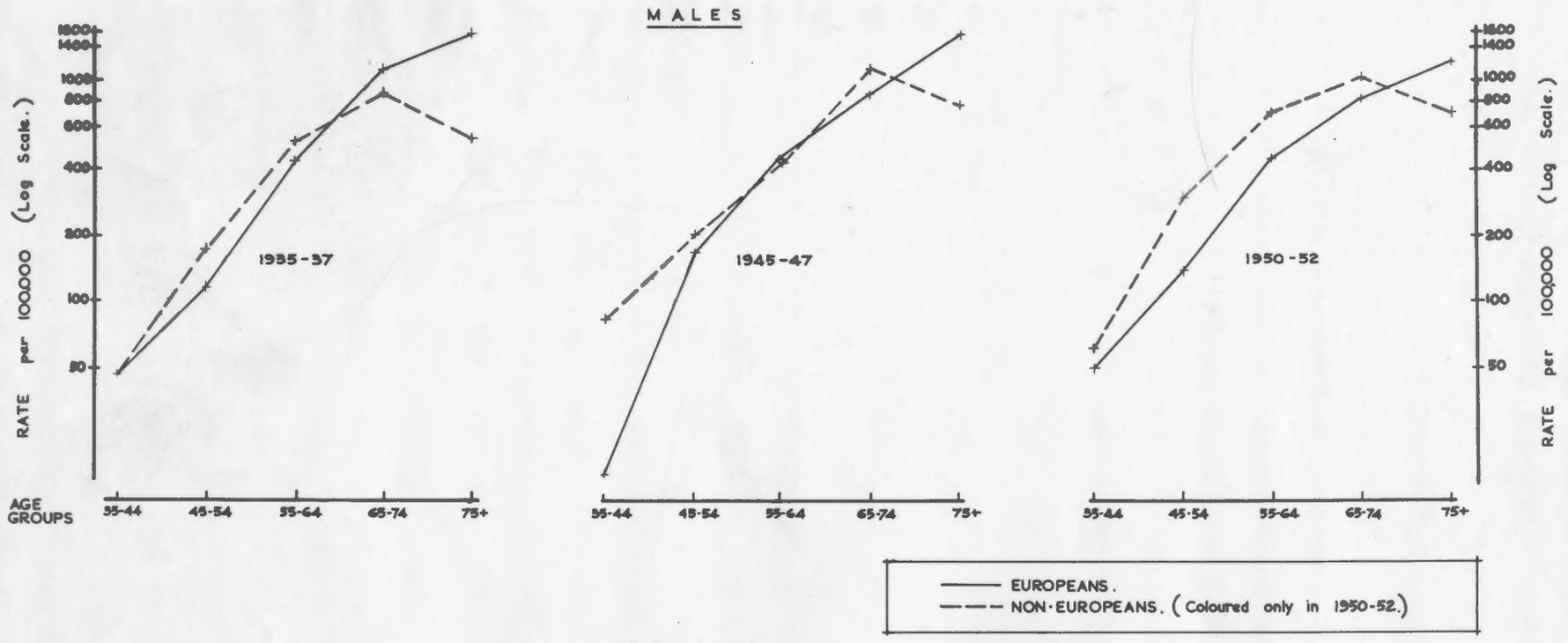
From the table and the chart the following trends are seen:-

(i) <u>The effect of age</u>: In general the rates rose with increasing age. Among Non-Europeans this occurred up to the age group 65 - 74, but in the oldest groups the rates tended to fall again. This pattern was consistent in male Non-Europeans, but less so in females.

(ii) <u>The effect of sex</u>: In all three periods and in both races, females generally had higher rates in younger age groups, while males had higher rates in the older age groups. In other words, the male gradient with age was steeper than the female.

(iii) <u>The effect of race</u>: The rates of Non-Europeans tended to be higher in middle age; those of Europeans rose more consistently and steeply with increasing age and were thus higher than those of Non-Europeans in the oldest groups. Only because of the larger numbers of Europeans in older groups of the population was their overall rate so much higher than the Non-European one.

CHART 14.



MORTALITY RATES FROM ALL FORMS OF CANCER BY RACE, SEX AND AGE.
CAPE TOWN 1935-37, 1945-47, 1950-52.

(iv) Secular trends: In the period 1936 to 1951 there were no consistent changes in the age and sex specific mortality rates among Europeans. The rate for all ages, however, steadily rose, but this was probably an expression of the steadily increasing proportion of older people in the population.

TABLE 95

MORTALITY FROM CANCER BY RACE, AGE AND SEX - CAPE TOWN, 1935-37 TO 1950-52. (AVERAGE ANNUAL RATE PER 100,000)

AGE GROUP	1935-37				1945-47				1950-52			
	EUROPEAN		NON-EUR.		EUROPEAN		NON-EUR.		EUROPEAN		NON-EUR.(2)	
	Dths.	Rate	Dths.	Rate	Dths.	Rate	Dths.	Rate	Dths.	Rate	Dths.	Rate
Males	(1)											
35-44	12	46	13	47	7	17	33	83	20	50	19	62
45-54	24	119	29	173	46	175	45	201	45	143	61	302
55-64	87	444	44	541	84	455	46	449	93	471	73	747
65-74	110	1166	32	884	129	898	56	1175	110	834	49	1045
75 +	45	1591	8	559	85	1625	23	791	102	1543	16	740
All ages	284	131	133	62	361	138	211	69	378	142	233	80
Females												
35-44	30	97	22	94	26	61	41	117	27	61	27	73
45-54	55	221	41	273	66	204	64	316	84	226	55	229
55-64	84	433	44	564	94	387	54	466	77	294	51	383
65-74	80	757	38	837	123	759	30	520	128	713	62	840
75+	56	1317	11	546	87	1223	21	520	100	1099	32	886
All ages (3)	317	134	173	79	405	144	225	74	424	147	242	73

(1) Deaths shown are totals for three years.
(2) Coloureds only.
(3) Including deaths from cancer at ages under 35.

Source: Calculated from data provided by Medical Officer of Health, Cape Town, Annual Reports, and Union Government Censuses of 1936, 1946 and 1951.

As mentioned above, the rates for Non-Europeans in 1950-52 were not strictly comparable with those in the previous two periods, and it is not possible to draw conclusions from secular differences in the rates. Because of the high proportion of Coloured people in the

Non-European population in 1936, it is, however, justifiable to compare the 1935-37 Non-European with the 1950-52 Coloured rates. If this is done, it appears that the cancer mortality rates among the Coloureds rose in all male, and in the oldest female age groups. In the rates for all ages combined the mortality from cancer rose for males, but fell for females of this race.

It should be noted, however, that in statistics concerning cancer mortality there are a number of weaknesses which make it essential to accept interracial differences and trends with caution. It is necessary to consider, for instance, whether the unexpectedly low cancer mortality in the oldest groups of the Non-Europeans could have been due to less accurate diagnosis. The proportion of deaths certified as being due to "senility" or "ill-defined causes" provides a measure of undiagnosed cancer in the aged. (Table 96).

T A B L E 96.

DEATHS OF PERSONS OVER 74 YEARS OF AGE ASCRIBED TO "SENILITY" OR "ILL-DEFINED CAUSES", CAPE TOWN, 1935-37 TO 1950-52.

	1935-37		1945-47		1950-52 (1)	
	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.
Total deaths in age group	928	346	1318	471	1691	642
Deaths due to senility and ill-defined causes	80	50	96	49	101	38
Per cent of all deaths	18.6	14.4	7.2	10.4	6.0	5.9

(1) Non-European figures are for Coloureds only.

Source: M.O.H., Cape Town, 1934-35 to 1951-52.

It can be seen from this table that the differences between the proportions of deaths in old age among Europeans and Non-Europeans which were ascribed to "senility" or "ill-defined causes" were unexpectedly small. Even if all these deaths among the oldest groups of Non-Europeans were in fact due to cancer, the cancer mortality rates in the age group 75+ would only in some cases be considerably higher than in the 65 - 74

group, as was the case among Europeans.

The age and sex specific death rates from cancer in England and Wales in two periods are given in Table 97 to provide a basis for comparison with the rates in Cape Town.

TABLE 97

SEX AND AGE SPECIFIC MORTALITY RATES FROM "ALL MALIGNANT DISEASES" - ENGLAND AND WALES. 1930-32 AND 1949.

(Rates per 100,000)

AGE GROUP	MALES		FEMALES	
	1930-32	1949	1930-32	1949
35 - 44	42.8	49.9	74.3	65.2
45 - 54	160.6	189.4	210.2	183.6
55 - 64	468.5	500.5	415.1	362.0
65 - 74	1017.7	1019.7	748.3	663.0
75 +	1396.7	1507.8	1189.6	1091.6

Source: Pascua (1952), Table 2b.

When these rates are compared with those for Cape Town Europeans in 1950-52 there are no consistent differences in the two sets of figures, although the Cape Town rates tend to be higher. In particular it should be noted that the rates in England and Wales steadily rise even in the oldest age groups just as those of the Cape Town Europeans do.

In other populations for which Pascua (1952) reports age and sex specific rates for mortality from cancer, it is interesting to note that the rates rise consistently with increasing age in every instance with only one exception. In Finland in 1930-31, 1940-41 and 1947-48 the male rates in the over 75 group are lower than those for the 65 - 74 age group. Female rates, however, are highest in the oldest group.

DISCUSSION.

On a superficial examination of the vital statistics in Cape Town, cancer is far more important as a cause of death among Europeans than among Non-Europeans. Pascua (1952), after an extensive review of the relevant reports concludes that "there are very pronounced differences

in the mortality from cancer and malignant tumours among the various nations of the world ..... Racial influences have been adduced as partial explanation of such observed divergences. But the relationship between cancer and 'race' has not been satisfactory, or even sufficiently, clarified until now ..... ".

Although the crude death rate from cancer is twice as high for Europeans as for Non-Europeans, age specific mortality rates show that the interracial differences are more complex.

The main difference in the mortality rates for all forms of cancer as between the races in Cape Town is to be seen in the oldest age groups. Whereas the rates for the European group continue to rise with increasing age, those of the Non-Europeans do not rise much, but rather decline when the oldest ages are reached. In general it appears that among Non-Europeans mortality rates from various forms of cancer rise at earlier ages, leaving the oldest age groups relatively immune; among Europeans, cancer mortality shows a steady increase with age. There are several possible explanations for this finding.

Among Non-Europeans who die in old age there may be more deaths due to cancer which are undiagnosed than among Europeans. However, as stated above, the proportion of deaths of old people ascribed to "ill-defined causes" or "senility" cannot entirely explain this trend in the over 75 age group.

There may be biological and social factors which render Non-Europeans who are prone to develop malignant neoplasms more likely to die of these conditions at earlier ages than Europeans. It may be that those Non-Europeans who survive till the oldest age group are particularly resistant to cancer. This hypothesis can only be tested by a fuller investigation of the types of cancer found in the various race, age, and sex groups, and of the comparative prognoses of these cases when they are so diagnosed. In the opinion of the Chief of the Radiotherapy Division of Groote Schuur Hospital, Non-European patients suffering from cancer in Cape Town are seen in a later stage of the disease than are European patients. There are also greater difficulties in the way of finding beds in hospital for Non-Europeans who require admission for therapy. (Grieve, 1955). These factors may well increase mortality from cancer

among Non-Europeans in Cape Town in the middle age groups, but it seems unlikely that the oldest groups would not be similarly affected.

There are known to be important racial and social differences in the incidence of certain types of cancer and of the organs affected (Berman, 1951; Doll and Hill, 1952 and Wynder, 1955) but the material provided by the available sources in Cape Town is not adequate for a detailed analysis of the types and sites of malignant disease, nor would such an investigation be within the scope of this study. It is, however, of obvious importance that further investigation be undertaken into the epidemiology of cancer in Cape Town as this may well throw light upon the interracial differences found. Such an investigation is in fact being planned. (Grieve, 1955).

5. CORONARY ARTERY DISEASE AND ANGINA PECTORIS.

Reports from several countries indicate that mortality rates from coronary artery disease and myocardial ischaemia are increasing. Epidemiologists are of the opinion that the increase is a real one, and not merely an artifact due to greater awareness of the condition in modern times. (Ryle and Russell, 1949; Morris, 1951; Keys, 1955).

There is evidence that deaths from this disease are also increasing in absolute and relative numbers in the City of Cape Town. The numbers of deaths from coronary disease and angina pectoris separated for race, sex, and age groups in Cape Town have been extracted from the records of the Medical Officer of Health of the City of Cape Town for the three periods 1935-37, 1945-47, and 1950-52. These have been related to the population data provided by the Union Censuses of 1936, 1946 and 1951 respectively. Age specific mortality rates have been calculated from the average number of deaths annually. As in the case of other causes of death it was not possible in the first two periods to separate those of Coloureds from other Non-European groups, while in the third period the age distribution of all the Non-European groups is not available. The 1950-52 rates are therefore for the Coloured section of Non-Europeans only. The 1946 Non-European population of Cape Town included 19 per cent Natives and Asiatics, which may have affected the calculated rates somewhat. In 1936 this proportion was only 12 per cent and the 1935-37 Non-European rates are

therefore considered more comparable with the 1950-52 Coloured rates.

The use of certified causes of death as a basis for scientific investigation suffers from the disadvantage that the reliability of diagnosis is variable. The clinical picture of coronary thrombosis was first clearly described in the United States in 1912 (Herrick, 1912) and in Britain as recently as 1925 (McNee, 1925). It is likely, therefore, that at least some of the increase in coronary artery disease is attributable to better clinical recognition.

On the other hand, the Medical Officer of Health's returns have the advantage that they reflect all the deaths attributed to coronary heart disease in the community, and not only those which are diagnosed in a particular hospital, or which are selected for autopsy by the pathologist, either in a hospital or a medico-legal laboratory.

The numbers of deaths which occurred in the three time periods in Europeans and Non-Europeans over the age of 34, together with the proportions of these certified as being due to diseases of the coronary arteries and angina pectoris are shown in Table 98.

TABLE 98.

DEATHS FROM CORONARY ARTERY DISEASE AND ANGINA PECTORIS CAPE TOWN, 1935-37, 1945-47 AND 1950-52

	EUROPEANS			NON-EUROPEANS (1)		
	1935-37	1945-47	1950-52	1935-37	1945-47	1950-52
MALES						
Deaths over 34 yrs. (All causes)	2056	2494	2523	1806	2456	2126
No. due to coronary disease	189	423	566	38	118	184
Per cent due to coronary disease	9.2	17.0	22.4	2.1	4.8	8.6
FEMALES						
Deaths over 34 yrs. (All causes)	1622	1995	2226	1398	1819	1861
No. due to coronary disease	64	187	341	21	67	104
Per cent due to coronary disease	3.9	9.4	15.3	1.5	3.7	5.6

(1) The 1950-52 period includes Coloured people only.

Source: Computed from data from M.O.H., Cape Town, Annual Reports, and Official Censuses for 1936, 1946 and 1951.

From Table 98 it can be seen that in the proportions of all deaths over the age of 34 years which were ascribed to coronary heart disease:

(i) Europeans had a higher percentage than Non-Europeans in each of the three periods.

(ii) The proportion for males was higher than that for females in each period, and in each race.

(iii) The proportions in each sex and race group have increased rapidly in the period 1935-37 to 1950-52, the relative increases being greatest among European females and least among European males.

As has been shown in an earlier section of this study, the European population of Cape Town includes considerably more people of older age groups than does the Non-European. There have also been secular changes in the age and sex composition of the various sections of the population. Crude mortality rates for deaths from coronary artery disease and angina pectoris, therefore, do not provide a valid basis for comparison because the mortality rates are not the same for the two sexes, and the rates rise steeply with increasing age.

This difficulty is overcome by using age and sex specific death rates for Europeans and Non-Europeans for 1935-37, 1945-47 and 1950-52. These are shown in Table 99 and illustrated graphically in Chart 15.

From the table and chart the following trends are seen:-

(i) The effect of age: The rates rise steeply with increasing age in both males and females. This is consistent for Europeans, but among Non-Europeans the rate usually declines in the 75 + age group. There was also some irregularity in the rise with age among the Non-European male group in the 1935 - 37 time period, which may have been due to the small numbers of deaths involved.

(ii) The effect of sex: In each time period, for each age group, and for both races, the male rate was higher than the female. (Table 100). The only exception to this was the Non-European 35 - 44 age group where very small numbers of deaths occurred.

TABLE 99

MORTALITY FROM CORONARY ARTERY DISEASE AND ANGINA PECTORIS BY RACE, AGE, AND SEX - CAPE TOWN, 1935-37 TO 1950-52 (Average annual rate per 100,000)

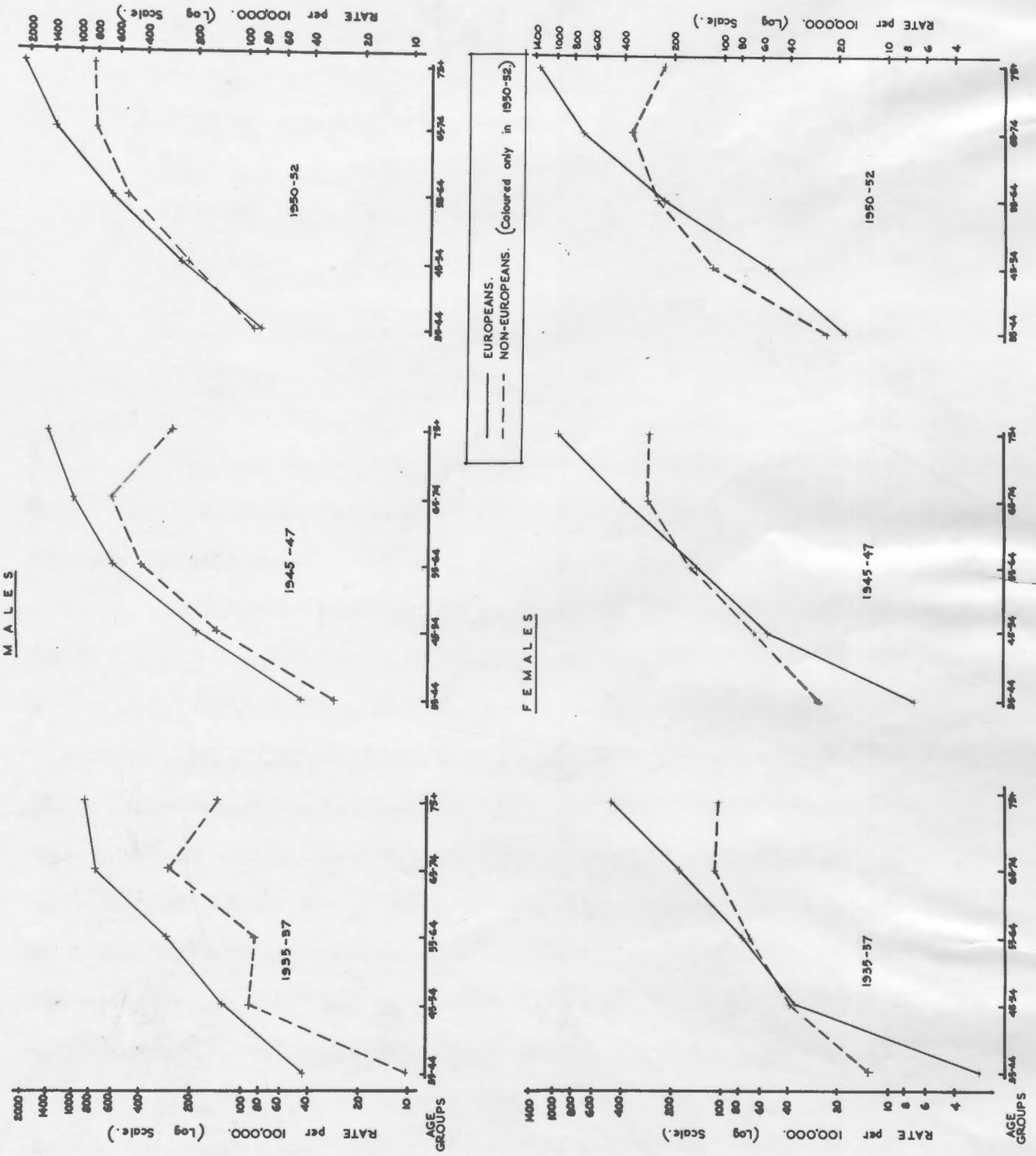
AGE GROUP	1935-37				1945-47				1950-52 (2)			
	EUROPEAN		NON-EUR.		EUROPEAN		NON-EUR.		EUROPEAN		NON-EUR.	
	Dths.	Rate	Dths.	Rate	Dths.	Rate	Dths.	Rate	Dths.	Rate	Dths.	Rate
	(1)				A. MALES							
35-44	11	43	3	11	18	45	12	30	33	82	27	89
45-54	26	129	16	95	50	190	33	148	78	249	49	243
55-64	55	280	7	85	111	601	42	411	127	642	51	522
65-74	72	762	10	273	162	1128	23	484	187	1410	39	834
75 +	25	880	2	145	82	1567	8	277	141	2133	18	839
All ages	189	87	41	19	425	163	121	39	570	214	189	65
					B. FEMALES							
35-44	1	3	3	13	3	7	9	26	8	18	9	24
45-54	9	36	6	40	17	53	13	64	20	54	28	116
55-64	15	77	5	65	35	145	18	155	60	229	33	248
65-74	19	179	5	112	64	394	16	275	126	702	26	353
75 +	20	472	2	103	68	957	11	275	127	1396	8	223
All ages	64	27	22	10	187	66	69	23	341	116	108	32

(1) Deaths shown are totals for three years.

(2) The Non-European rates for 1950-52 are based on deaths and population of Coloured people only.

Source: Computed from data in M.O.H., Cape Town, Annual Reports and Official Censuses for 1936, 1946, and 1951.

CHART 15.



MORTALITY RATES from CORONARY ARTERY DISEASE and ANGINA PECTORIS by RACE, SEX and AGE.
CAPE TOWN 1935-37, 1945-47, 1950-52.

T A B L E 100

SEX RATIOS OF MORTALITY RATES FROM CORONARY HEART DISEASE CAPE TOWN, 1935-37, 1945-47 AND 1950-52.

(Male/Female Rates).

AGE GROUP	1935-37		1945-47		1950-52	
	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.
35 - 44	14.3	0.8	6.4	1.2	4.6	3.7
45 - 54	3.6	2.4	3.6	2.8	4.6	2.1
55 - 64	3.6	1.3	4.1	2.7	2.8	2.1
65 - 74	4.3	2.4	2.9	1.8	2.0	2.4
75 +	1.9	1.4	1.6	1.0	1.5	3.8
All ages	3.2	1.9	2.5	1.7	1.8	2.0

On the whole the sex disparity among Europeans consistently diminished with increasing age, and it also tended to lessen from 1935-37 to 1950-52.

There were no consistent trends in the sex ratios among Non-Europeans, but it must be remembered that the numbers of deaths, especially of females, in this group were rather small.

(iii) The effect of race: In general Non-European male rates were lower than those of European males, and the disparity increased with age. In 1950-52, however, where the figures referred to Coloureds only, the European rate in the 35 - 44 group was actually slightly lower than the Non-European, although the difference was not statistically significant. At all ages after 44 the European rate was higher, and the disparity between race groups increased with age.

Among females the pattern was consistent. Non-European female rates in the middle age group were higher than European, but European female rates rose more rapidly, and were the higher for the older age groups.

Among Natives coronary artery disease is extremely uncommon in Cape Town. Each year only 3 or 4 deaths from this cause are reported, and it appears that this racial group is markedly different from Europeans and Coloureds as regards coronary disease.

Confirmatory evidence of this low incidence was provided by Vogelpoel and Schrire (1955). They reported that in 1953 and 1954 in the largest hospital in Cape Town, 5,004 European, Coloured and Bantu (Native) patients were referred to the Cardiac Clinic for suspected coronary disease. Of these patients, there were only 2 Natives who showed electrocardiographic evidence of myocardial infarction, against 448 Europeans and 100 Coloureds who did so.

(iv) Secular trends: Mortality rates from coronary artery disease for both sexes, both races, and each age group increased from 1935-37 to 1950-52. This increase was consistent throughout for Europeans and for male Non-Europeans but was inconsistent for female Non-Europeans in the 35 - 44 and 75 + age groups. These inconsistencies may have been due to the small numbers of deaths from coronary artery disease in these two age groups, to the smallness of the population in the oldest age group, or to the differences in racial composition of the populations being compared.

TABLE 101

SECULAR TRENDS IN MORTALITY FROM CORONARY ARTERY DISEASE AND ANGINA PECTORIS IN CAPE TOWN, BY RACE, AGE, AND SEX.
(Ratios of 1950-52 to 1935-37 rates)

AGE GROUP	EUROPEANS				NON-EUROPEANS			
	Male		Female		Male		Female	
	1935-37	1950-52	1935-37	1950-52	1935-37	1950-52	1935-37	1950-52
35-44	100	191	100	600	100	809	100	185
45-54	100	193	100	150	100	256	100	290
55-64	100	229	100	297	100	614	100	382
65-74	100	185	100	392	100	305	100	315
75 +	100	242	100	296	100	479	100	217
All ages	100	245	100	430	100	342	100	320

If the rates in 1935-37 are compared with those of 1950-52 (Table 101) it appears that the increase in mortality rates from coronary heart disease are greatest among European females, and least among European males, with those of Non-Europeans, male and female,

intermediate.

Comparison with other populations.

The age specific mortality rates from coronary heart disease in Cape Town are compared with those of England and Wales and United States urban whites. (Table 102).

TABLE 102.

COMPARISON OF AGE SPECIFIC DEATH RATES FROM CORONARY DISEASE - CAPE TOWN, ENGLAND AND WALES, AND UNITED STATES

AGE GROUP	CAPE TOWN (1)				ENGLAND & WALES (2)		UNITED STATES(3) URBAN WHITES.
	1945-47		1950-52		1947	1950	
	Eur.	Non-E.	Eur.	Non-E.			1940
Males							
35-44	45[x]	30[x]	82	89	21.6	26.8	58
45-54	190	148	249	243	105.4	136.8	204
55-64	601	411	642	522	294.0	425.7	465
65-74	1128	484	1410	834	605.0	902.8	805
75 +	1567	277[x]	2133	839[x]	864.7	1424.0	1229
Females							
35-44	7[x]	26[x]	18[x]	24[x]	3.4	3.8	11
45-54	53[x]	64[x]	54	116	18.0	24.3	42
55-64	145	155[x]	229	248	80.4	125.3	142
65-74	394	275[x]	702	353	262.8	435.3	375
75 +	957	275[x]	1396	223[x]	477.9	856.9	770

Sources:

(1) Computed from data from M.O.H., Cape Town, Annual Reports, and Union Government Censuses for 1946 and 1951.

(2) Warren (1953).

(3) Gover and Pennell (1950).

x Based on less than 20 deaths.

From these figures it can be seen that the Cape Town European rates were higher than those of England and Wales in each age group, and higher than those of the United States whites in the older age groups. In general, the Cape Town Non-European figures were also higher than the British in middle age, but lower in the oldest age

groups. Compared with the United States rates of 1940, the Non-European rates of 1950-52 were generally higher in all age groups except the oldest.

DISCUSSION.

In a discussion on the epidemiology of coronary heart disease it is necessary to consider both the biological and the social factors which may be associated with the incidence and aetiology of the disease.

(a) BIOLOGICAL FACTORS.

Age, Race and Sex.

Age is clearly related to the incidence of coronary deaths. In all communities and in both sexes, the incidence below the age of 35 years is almost negligible. After 35 mortality rates rise rapidly with each age and sex group.

The only exception to this trend occurred in the 75 + age group among Non-Europeans in all three periods under review. In this age group the mortality rate from this cause either dropped below that of younger ages, or rose only very slightly. This applied to both males and females. This decline in the rates in the oldest age group cannot be explained by higher proportions of deaths among Non-Europeans which are certified as being due to "senility" or "ill-defined causes" (see Table 96).

Just as in the case of mortality from all forms of cancer, it appears that, among Non-Europeans, those who survive until old age are in some way more highly selected with regard to susceptibility to coronary disease. It is possible, too, that the relatively low death rate of these old people from coronary artery disease is a reflection of their different environment, past or present. Neither of these possibilities can be tested in this study, nor can one explain why they do not apply to the aged among Europeans.

Pennell and Lehmann (1951) produced statistics and graphs comparing mortality from coronary artery disease in whites and Negroes in the United States in 1940. It is interesting that the curve for the United States whites was very similar to that of Europeans in Cape Town; that for Negroes closely resembled the Coloured curve in 1950-52

and rose only slightly in the oldest age groups.

As in other communities, males had higher mortality rates for coronary heart disease than females of the corresponding age and race groups in Cape Town. For Europeans the sex disparity was greatest in the younger groups, and lessened with increasing age, and this was similar to the sex differences seen in the rates from other populations already quoted. (Table 102).

The fact that the disparity between the sexes diminishes with age suggests that there may be an endocrine basis to this difference. (Editorial, 1955, Minneapolis Symposium, 1955).

However, even if the sex differences are basically endocrine in origin, the possibility still exists that other socially determined factors such as stress, occupation, smoking, etc., may also play a part.

Genetic factors.

Although Brink (1949) attempted to explain the lower incidence of coronary thrombosis among the Bantu (Natives) in South Africa on an anatomical basis, others (Elliott,1953; Singer, 1955) do not accept this explanation.

Gertler and White (1954) reported that coronary heart disease has a significant association with a specific body habitus. The fat, muscular person was most prone, and the lean type least prone to develop the disease. Although certain data are available concerning physique of workers of different racial groups in Cape Town (Singer, 1955 a), it is at present impossible to assess the importance of this factor in explaining interracial differences in mortality in the population as a whole.

Coronary disease is frequently observed by clinicians to have a familial incidence (Gertler and White, 1954), but human families share their way of life just as much as they do their genes. It would be difficult or impossible to say how much of the observed familial incidence was due to heredity, and how much to environment, without much more detailed investigation.

(b) SOCIAL FACTORS.

Social class.

The Registrar-General of England and Wales (1954) provides the best evidence of the association of mortality from coronary heart disease

and social class. The statistics for coronary heart disease are summarized in Table 103.

TABLE 103

STANDARDISED MORTALITY RATIOS FOR CORONARY HEART DISEASE BY SOCIAL CLASS. ENGLAND AND WALES.

	SOCIAL CLASS				
	I	II	III	IV	V
MEN, 20-64					
1930-32	237	148	95	66	67
1950	150	110	104	79	89
WOMEN, 20-64					
1930-32	157	126	93	85	88
1950	92	93	101	100	108

Source: Great Britain, Registrar-General (1954) Tables 5 and 11.

It can be seen that for men of Social Class I (professional and managerial) the ratio was considerably higher than that for men of Social Class V (unskilled labourers). The gradient between social classes diminished considerably between 1930-32 and 1950.

In women there was a similar gradient between social classes in 1930-32, but in 1950 "for some inexplicable reason" (Logan, 1954), the slope was reversed in women.

If the European and Non-European sections of the population of Cape Town are regarded as representing two broad social classes, the pattern of mortality from coronary heart disease in Cape Town in relation to social conditions is seen to be similar to that in England and Wales.

A number of social factors have been invoked to explain the uneven distribution of coronary artery deaths among different sections of the population. Among these factors the most important are variations in physical activity, mental stress, smoking, and dietary habits, especially in the consumption of fats.

Physical activity.

It is generally agreed that with increased mechanization modern life is associated with a decreasing expenditure of physical effort. It is possible that this factor accounts to some extent for the increase in mortality from coronary heart disease.

In general, as one proceeds from the lowest to the highest socio-economic classes the degree of physical activity required in one's occupation diminishes. However, it is not easy to separate the other variables which are associated with differences in social class, nor is it easy to make allowances for physical activity outside of one's occupation, such as the effort entailed in getting to and from work or the energy expended in leisure time activities.

Stocks (1951) and Morris et al (1952, 1953) have produced evidence to show that even within social classes there are considerable variations in the incidence of coronary heart disease. Workers who expend less physical effort, e.g. bus drivers, have a higher mortality rate from this cause than those who are more active physically, e.g. conductors on double decker buses.

It is safe to say that in Cape Town the Non-Europeans are in general compelled to expend more physical effort in their occupations and in getting to and from their places of work than are Europeans, and that this may be a factor which plays a part in determining the higher mortality rates of the former group.

Mental stress.

The increase in mental stress has been assumed by several authors to account for the rising incidence of coronary heart disease in modern times. (Dunbar, 1943, pp. 302-307; Ryle and Russell, 1949; Warren, 1953).

On the other hand, mortality rates from this cause were found to drop in Norway (Strøm and Jensen, 1951) and the Netherlands (Schornagel, 1953), during World War II when it seems unlikely that mental strain was diminished, although it is possible that certain stresses were lessened by the unification of the population in resistance movements. Other possible aetiological factors, such as increased physical effort, diminished smoking, and lowered consumption of fats, etc., may

well have operated sufficiently strongly to overcome the effects of increased mental stress caused by war conditions.

On the whole there is little to support the concept that mental stress is an important aetiological factor in coronary heart disease. (Arnott, 1954). It would be difficult to prove that the mental tensions associated with executive responsibility and social ambitions are more potent than the anxieties associated with poverty. Certainly, no satisfactory evidence can be adduced to show that differences in mental stresses are responsible for the variations in coronary heart disease mortality as seen in the two racial groups in Cape Town.

Smoking.

There is evidence that heavy smoking of cigarettes and death from coronary artery disease are associated. Hammond and Horn (1954), in an extensive follow-up study in the United States, showed that the mortality among cigarette smokers from coronary heart disease was considerably higher than among non-smokers, and that the excess mortality increased with the number of cigarettes smoked. Although many of those who died of coronary heart disease were non-smokers, it seemed likely that the smoking of cigarettes played some part in the aetiology of the disease.

In Cape Town, Bronte-Stewart and his associates (1955) in their survey of workers, investigated, among other things the smoking habits of their subjects. The results are shown in Table 104.

TABLE 104

SMOKING HABITS OF WORKING MEN AGED 40-58, CAPE TOWN, 1955.

RACE	NO. IN SAMPLE	NON-SMOKERS (%)	(1) HEAVY SMOKERS (%)		
			Pipe	Cigarettes	Total
European	181	28	18	39	57
Coloured	179	19	26	31	57
Native	226	28	51	5	56

Source: Data kindly provided by Dr B. Bronte-Stewart, Department of Medicine, University of Cape Town (1955).

(1) Criteria for "heavy" smoking:
Pipe - more than 4 oz tobacco per fortnight.
Cigarettes - more than 20 cigarettes daily.

The differences in the percentages of European and Coloured workers who were non-smokers, or who smoked heavily, either pipe or cigarettes, were not statistically significant. Of the Native workers a significantly higher proportion were heavy pipe smokers as compared with either the European or Coloured workers.

It is impossible to state how far - with regard to smoking habits - one can generalise from this sample to the European, Coloured and Native populations of Cape Town as a whole. Although there appears to be little difference in tobacco consumption among European and Coloured workers in 1955, without further investigation into such points as the duration of heavy smoking, we are unlikely to be able to assess the importance or otherwise of tobacco in the production of inter-racial differences in incidence of coronary heart disease.

Diet.

In recent years increasing attention is being paid to the possible relationship between dietary habits and the incidence of coronary disease. Variations in diet are cited as an important aetiological agent in the production of social and racial differences in mortality from this disease. The observed increase in incidence in modern times is ascribed to similar factors.

The rising standard of living in Western communities has been accompanied, inter alia, by an increase in the consumption of fats. The association between quantities of fat eaten, serum lipo-protein levels and the incidence of coronary artery disease in various communities has been shown in a number of studies which are reviewed by Gofman et al (1954) and Keys (1953, 1955). The ingestion of fat and the development of coronary artery disease are connected by the fact that fat can be conveyed in the blood stream only in the form of water soluble lipo-proteins of which cholesterol is an essential ingredient.

The report of Strøm and Jensen (1951) that coronary deaths diminished rapidly in Norway when the fat ration was drastically curtailed during World War II is also used to support the dietary theory. Morris (1955a) however, points out that although the reduction of fats in the national ration in England and Wales was not as severe as it was in Norway, it continued for ten years and actually attained its greatest

severity in 1947. Nevertheless, the coronary death rate in England and Wales, after a slight fall in the early years of the war, resumed its steep ascent in 1943.

In a recent investigation in Cape Town, Batson (1953) studied the diets of a sample of poorer class European, Coloured and Native households. He found that the consumption of fats among the Europeans was double that of the Natives, with the Coloured level intermediate.

Bronte-Stewart et al (1955) investigated the bodily characteristics, blood cholesterol and lipoproteins, diet and personal habits of 383 European, Coloured and Native workers aged 40 - 58 years in Cape Town and its vicinity. They found that the European workers consumed more than twice as much fat, and they had significantly higher mean serum cholesterol and beta-lipoprotein levels than the Native workers. The figures for Coloured workers fell between those of the two other racial groups. The differences in serum chemistry were highly significant. When the racial groups were further sub-divided it was found that with an increase in income in each sub-group there was a corresponding increase in mean fat consumption and in serum cholesterol and beta-lipoprotein levels. These findings were related to the observation that "in Cape Town the death rate ascribed to coronary heart disease in the individual of pure European descent is more than twice that of the Cape Coloured in the age group 35 years and over". They concluded that the findings of their survey added weight to the theory that the dietary fat intake influenced the level of the serum cholesterol and in turn might be one of the major factors influencing the pathogenesis of coronary heart disease.

This investigation by Bronte-Stewart and his associates is particularly relevant to the present study and may go far to explain the differences in mortality experience of Europeans and Coloured people in Cape Town.

There are, however, certain difficulties in the way of accepting dietary differences as the explanation of the inter-racial variations in mortality from coronary heart disease, even though as the authors state, it may be only a partial explanation.

The physical activity of workers at their occupations generally declines as the socio-economic status rises. In Cape Town Europeans

have the most sedentary, and Natives the most active occupations, with the Coloured workers intermediate. The inter-racial differences in coronary heart disease mortality could therefore equally easily be due to variations in physical activity, as has been suggested by Stocks (1951) and Morris et al (1952) in other populations.

If the consumption of dietary fat is an important factor in the pathogenesis of coronary heart disease, it is difficult to explain why the mortality rates in 1950-52 for European and Coloured males in the 35-44 and 45-54 age groups should be approximately the same, (Table 99), but widely different in older age groups, unless factors other than present fat consumption levels, are also at work.

It is possible that the younger generation of Coloured males is catching up on the European males as far as coronary artery deaths is concerned, and that in forty years time, when the group that are now 35-44 years old have reached the oldest age group, the differences between Coloured and European males will have been obliterated. But as far as socio-economic status is concerned, the Coloured males of middle age in Cape Town are still considerably below the Europeans of corresponding ages, and it seems unlikely that there is at present a great similarity in the average dietary habits of these two groups.

No information is available concerning the dietary habits of Coloured and European women in Cape Town. Brock (1949) was of the opinion that Coloured women of middle age ate more fats and starches and were more obese than European women of the corresponding age group. If this were so, it might possibly link up with the higher coronary heart disease mortality rates among Non-European women compared with European women up to the age of 64. Batson's (1953) survey, however, based on household consumption of foods, rather invalidates Brock's impression. As mentioned above, it seems likely that an endocrine factor plays a part in producing differences in susceptibility to coronary disease as between the sexes - this factor may be affected by the greater fertility of Coloured women.

Two pathological conditions which are common in Cape Town may help to explain the relatively high mortality from coronary heart disease among the Coloured population.

Syphilis of the aorta, known to be more common among Coloureds in Cape Town, may occasionally produce a clinical or pathological picture resembling that of coronary ischaemia due to atherosclerosis.

It is possible that syphilis to some extent accounts for the relatively high incidence of coronary deaths among Coloured middle age groups, but it is unlikely that it is an important factor.

The other condition which is recognised as having an association with coronary heart disease is diabetes mellitus. There are no statistics concerning the inter-racial differences in the true incidence of diabetes mellitus in Cape Town, although mortality data show that it is a relatively more common cause of death among the Coloureds in middle and older age groups. It is possible that a greater prevalence of this disease, especially of inadequately treated cases, among the Coloureds, helps to account for their higher mortality rates from coronary heart disease in middle age. This is rendered more likely by the fact that morbidity and mortality from diabetes mellitus are higher among females, and the observation that the inter-racial differences in coronary heart disease mortality rates in middle age are greater in the same sex.

CONCLUSION

In conclusion it can be stated that the mortality rates for coronary heart disease in Cape Town over the period 1935 to 1952 have in general been higher for Europeans than for Non-Europeans. In both races the rates showed a considerable rise during the period under review. In the youngest age groups which are susceptible to this disease (35-44 and 45-54) the inter-racial differences have been less than in the oldest age groups. In fact, the Non-European rates in middle age were higher than the European rates in 1950-52, although in old age the European rates were far higher.

In both races the rates have been higher for males than for females. The sex differences were more marked in middle and less marked in old age. On the whole, the female rates in the two races differed less from each other than the male rates did.

In examining these differences in the light of current theories regarding the social class variations in the incidences of coronary heart disease, we are faced with the difficulties involved in separating

the effects of various factors which may be operating. There is evidence to show that in Cape Town Europeans consume more fats in their diets than Non-Europeans do, and that serum lipoprotein levels are higher in the former group than in the latter. These findings may be aetiologically related to coronary heart disease, but they in no way lessen the possibility that lack of physical activity may be just as important, if not more so. The evidence concerning relative mental stresses in the racial groups is as yet inconclusive, and it would be impossible at present to say that the Europeans are subject to greater strains of this nature. Differences in the prevalence of cigarette smoking, probably only a minor aetiological factor, can also not be used to explain the inter-racial variations found.

Coronary heart disease is not only a major cause of death to-day, but its importance is growing. Although increasing light is being shed on its aetiology, many aspects are still obscure. Cape Town, with its range of populations of widely differing social and economic backgrounds has much to offer as a field for epidemiological research into this disease.

S U M M A R Y

This thesis is an epidemiological study of the public health of the City of Cape Town over the first half of the present century. The basic data are derived from available census, public health, sociological and other reports.

The advantages of Cape Town as a unit for epidemiological study are outlined, and the scope and limitations of the study are given.

The physical characteristics of the City of Cape Town and the historical origins of its people - European, Coloured, Asiatic and Native - are briefly reviewed.

Social conditions, which form the background to the health of Europeans and Non-Europeans, show marked contrasts. Reports reveal that about one-third of Coloured households in 1951 could not afford to buy the basic necessities of life, and that only a small proportion of Coloured workers were engaged in the more highly skilled occupations. There is evidence that their housing conditions, always bad, have been steadily deteriorating. Although scientific proof is scanty, their nutritional state is much worse than that of Europeans. Far less public money is spent on social security and educational services for Non-Europeans, who also suffer disadvantages as regards health services. Although they are utilizing the available facilities to an increasing extent, there is evidence that there is insufficient hospital accommodation for Non-Europeans, especially when their greater needs and poorer resources are considered.

Cultural problems which arise in public health work, and the significance of alcoholism and crime among Non-Europeans are briefly commented on.

Demographic data are shown to be important to a study of public health, not only because they provide the bases of vital statistics, but also because they are a reflection of the health of the community. The South African War and the recent growth of the city's population, a result of immigration, industrialization and urbanization, have had many effects on the health of the people. Social conditions

are reflected in, and are themselves influenced by the age and sex composition of the population. These demographic changes are illustrated by means of population pyramids which reveal marked inter-racial differences in sex ratios, and in the proportions of children and aged people.

Various reproductive rates are used as indices of health of the four main racial groups in Cape Town. Crude birth rates of Europeans follow trends similar to those of other western communities, while those of Non-Europeans are considerably higher. Fertility rates, which are more refined measures, clearly show the decline in European reproductivity in contrast to Non-European rates.

Biological and social factors influencing fertility are discussed. It is probable that Non-Europeans lack motivation to limit family size, and are ignorant of contraceptive methods to a greater degree than are Europeans.

Comparison of various mortality statistics also reveals inter-racial contrasts. In the past fifty years the decline in crude mortality rate for Europeans in Cape Town was 33 per cent, whereas that for Non-Europeans was 60 per cent. Standardisation of the rates, however, greatly reduces this discrepancy. The reduction in crude mortality rates began about 30 years earlier for Europeans than for Non-Europeans, but Coloured and Non-European death rates have been halved in the last 15 years.

For all races, except Natives, male death rates are higher than female, and the proportions of all deaths which occur in infancy and childhood are greater for Non-Europeans. Age specific death rates reflect even more clearly the waste of life among Non-Europeans in the youngest age groups. This disparity steadily lessens with increasing age, and disappears in the oldest groups.

Trends and levels of mortality for Europeans in Cape Town are similar to those of Western populations elsewhere, whereas mortality rates of Non-Europeans are still at the high levels which existed in these populations some decades ago.

The inter-racial differences in mortality found in Cape Town are discussed in the light of existing knowledge concerning the biological

and social factors which have elsewhere been found to be related to the subject.

Health of children is dependent upon the fitness of their mothers, as well as on their early environment after birth. Vital statistics reflecting maternal and child health are considered to be sensitive indices of social and economic conditions.

Maternal mortality rates in Cape Town are at a lower level, and reveal an earlier and greater decline for Europeans than for Non-Europeans. European rates compare favourably with those of other Western populations, but those of Non-Europeans are much inferior.

In Cape Town, during the past 40 years, still-birth rates for Europeans show a greater proportional reduction and are lower than those for Non-Europeans. The European still-birth rate in Cape Town is unexpectedly low when compared with that of other groups such as social class I in England and Wales. This fact warrants further investigation.

Non-European infant mortality rates are higher than, fluctuate more, and decline less than those of Europeans. However, the latter rates are still above those of advanced countries. Mortality in the neonatal period, which manifests similar inter-racial trends, but which has smaller reductions than those shown by infant mortality, is consequently becoming of greater relative importance. European neonatal mortality rates, like still-birth rates, compare favourably with the lowest statistics of other populations, but those of Non-Europeans are considerably higher.

An account of the scientific knowledge concerning influences affecting maternal and infant mortality suggests that biological and social factors interact closely. The influence of race, age and parity of mother, rapidity of breeding, multiple births, prematurity and other biological factors are briefly outlined. The health of mothers and their infants is related to locality of residence, social class, housing, nutrition, size of family, maternal occupation, illegitimacy, availability and utilisation of medical services, maternal efficiency, intelligence and literacy. The effects of these biological and social factors on the well-being of mothers and infants in the

various racial groups of Cape Town are referred to.

Investigation of diagnoses given as the causes of death at various times establishes the fact that for all diseases except cardiac conditions, cancer, and diabetes, Non-European rates are higher than those of European. During the past 40 years there have been steep declines in mortality from infectious diseases for both races, although for Non-Europeans tuberculosis began to lessen in importance only in the last seven years. Except in the case of degenerative diseases, inter-racial differences in mortality rates show an increase, the greatest disparity occurring in the common infectious diseases, diarrhoea and enteritis, tuberculosis, and bronchitis and pneumonia.

A study of the causes of infant deaths presents similar inter-racial differences, these being particularly marked for diseases of infective origin, including diarrhoea and enteritis, and syphilis. In these diseases the decline in mortality has been steeper for Europeans, so that the disparity in death rates between the races has become even more marked in recent years than it was 40 years ago. Prematurity as a cause of infant death is twice as common among Non-Europeans, but congenital malformations are significantly more common among Europeans - an unexpected finding which merits further investigation.

In the second year of life, inter-racial differences are even more striking - not only for all causes of death, but also for individual diagnoses. It appears, therefore, that mortality in the second year of life is an index of social conditions which may be of even greater sensitivity than the infant mortality rate itself.

Certain causes of death have been selected as index diseases to illustrate inter-racial differences in mortality trends, as follows:

1. <u>Tuberculosis</u>.

Non-European mortality rates for tuberculosis, the classical social disease, have been similar to, or higher than, those seen in Britain a century ago, or in cities severely disorganised in the last war. European death rates have been steadily declining for many years, but those of Non-Europeans, after a war-time rise, have improved only since 1948. The race, sex, age, and secular trends are discussed, and illustrated by means of charts. Factors influencing mortality from

tuberculosis are reviewed and related to the Cape Town background.

2. Diarrhoea and enteritis.

This is now the commonest cause of death among Non-Europeans, having for them a mortality rate which is sixteen times as great as for Europeans. The inter-racial differences are even greater in the second year than in the first year of life. Although both racial groups show declines in mortality rates from this cause, that for Europeans is much steeper. Social and other factors associated with these trends are discussed.

3. Enteric fever.

The incidence of this disease is generally regarded as an important measure of the sanitary state of a community. Mortality from this cause is also considerably higher for Non-Europeans, but even for Europeans the death rate has been slow to fall in comparison with London figures.

4. Cancer.

Although crude mortality rates from cancer of all sites are approximately twice as high for Europeans, inter-racial differences are reduced when age specific rates are calculated. In middle age, on the whole, Non-Europeans have higher rates, but in old age their rates do not continue to rise as do those of Europeans. Though females of both races tend to have bigger rates in middle age, those of males are greater in old age. There is no evidence of a consistent increase in age specific mortality rates in the period 1936 to 1951. The inter-racial differences in mortality from cancer are discussed in the light of statistics from other populations, but it is evident that further investigation into the incidence of, and mortality from, various types of cancer is necessary.

5. Coronary artery disease.

This disease is causing an increasing number of deaths in populations with rising standards of living. In Cape Town, crude mortality rates from this cause are much higher among Europeans, but for both races the rate is increasing. The inter-racial differences are small before the age of 55-64, but thereafter the rates for Europeans rise rapidly, whereas those for Non-Europeans tend to remain at the

same level, or even to fall, in old age. As in other communities, male rates for both races are higher than female, but the disparity decreases with age. Compared with statistics from England and Wales, and the United States, Cape Town rates, both European and Non-European, are generally high. Current theories concerning the increase in mortality from coronary heart disease, and the observed racial and social class variations in incidence are commented on in relation to the findings of this study.

APPENDIX A

POPULATION OF MUNICIPALITY OF CAPE TOWN AT VARIOUS CENSUSES, 1904 TO 1951

1. 1904 CENSUS

AGE GROUP	EUROPEANS			OTHERS		
	M	F	Total	M	F	Total
0 - 4	1657	1770	3427	1962	1974	3936
5 - 14	3034	2931	5965	3010	3210	6220
15 - 24	6940	3364	10304	4741	3717	8458
25 - 34	9048	3196	12244	5016	2580	7596
35 - 44	4650	1940	6590	2325	1449	3774
45 - 54	2237	1145	3382	1024	904	1928
55 - 64	813	597	1410	472	438	910
65 - 74	283	296	579	177	210	387
75 +	88	146	234	74	123	197
All ages	28750	15385	44135	18801	14605	33406

Source: Derived from M.O.H., Cape Town, 1904-5, Table IX

2. 1911 CENSUS

AGE GROUP	EUROPEANS			OTHERS		
	M	F	Total	M	F	Total
0 - 4	1613	1611	3224	2702	2689	5391
5 - 14	2951	2824	5775	4367	4414	8781
15 - 24	3189	2742	5931	3271	4423	7694
25 - 34	3395	2624	6019	3639	3391	7030
35 - 44	2931	1890	4821	2212	1965	4177
45 - 54	1672	1264	2936	1248	1188	2436
55 - 64	865	721	1586	555	649	1204
65 - 74	354	356	710	213	302	515
75 +	102	175	277	88	143	231
All ages	17072	14207	31279	18295	19164	37459

Source: U.G. 32a/1912.

3. 1921 CENSUS

AGE GROUP	COLOUREDS			ASIATICS		
	M	F	Total	M	F	Total
0 - 4	4776	4780	9556	66	75	141
5 - 14	8967	9205	18172	117	71	188
15 - 24	7106	10210	17316	189	70	259
25 - 34	5248	6580	11828	423	63	486
35 - 44	3932	4413	8345	573	42	615
45 - 54	2632	2715	5347	334	9	343
55 - 64	1263	1442	2705	89	3	92
65 - 74	492	625	1117	21	2	23
75 +	262	334	596	73	2	75
All ages	34678	40304	74982	1885	337	2222

AGE GROUP	EUROPEANS		
	M	F	Total
0 - 4	4716	4585	9301
5 - 14	10474	10229	20703
15 - 24	9499	10493	19992
25 - 34	7053	8269	15322
35 - 44	7096	7190	14286
45 - 54	6441	5366	11807
55 - 64	3212	3121	6333
65 - 74	1349	1523	2872
75 +	426	643	1069
All ages	50266	51419	101685

AGE GROUP	BANTU (NATIVES)		
	M	F	Total
Under 1	24	32	56
1 - 14	129	110	239
15 - 50	3497	484	3981
50 +	128	27	155
Uns.	35	2	37
All ages	3813	655	4468

Sources: U.G. 33/23 and U.G. 40/24

4. 1926 CENSUS

AGE GROUP	EUROPEANS			COLOUREDS		
	M	F	Total	M	F	Total
0 - 4	5117	5024	10141	6348	6255	12603
5 - 14	10228	10050	20278	9734	10164	19898
15 - 24	11676	12251	23927	8470	11589	20059
25 - 34	8236	9352	17588	6299	7741	14040
35 - 44	6706	7655	14361	4337	4998	9335
45 - 54	7047	6505	13552	3123	3234	6357
55 - 64	4243	3959	8202	1542	1653	3195
65 - 74	1713	1973	3686	543	684	1227
75 +	561	731	1292	239	340	579
All ages	55527	57500	113027	40635	46658	87293

AGE GROUP	ASIATICS			NATIVES		
	M	F	Total	M	F	Total
0 - 4	118	119	237	315	329	644
5 - 14	245	128	373	298	326	624
15 - 24	230	90	320	1790	396	2186
25 - 34	299	106	405	3941	618	4559
35 - 44	498	43	541	2046	265	2311
45 - 54	412	20	432	786	111	897
55 - 64	124	8	132	211	42	253
65 - 74	27	3	30	43	16	59
75 +	4	4	8	27	5	32
All ages	1957	521	2478	9457	2108	11565

Source: U.G. 45/1927 (Appendix).

5. 1936 CENSUS

AGE GROUP	EUROPEANS			COLOUREDS		
	M	F	Total	M	F	Total
0 - 4	6167	5915	12082	9856	9686	19542
5 - 14	13008	12748	25756	15467	15944	31411
15 - 24	13925	15294	29219	10724	14494	25218
25 - 34	13177	14483	27660	9596	11491	21087
35 - 44	8668	10334	19002	6165	7028	13193
45 - 54	6720	8276	14996	4103	4748	8851
55 - 64	6533	6465	12998	2222	2514	4736
65 - 74	3148	3527	6675	1074	1481	2555
75 +	943	1420	2363	425	656	1081
All ages	72289	78462	150751	59632	68042	127674

AGE GROUP	ASIATICS			NATIVES		
	M	F	Total	M	F	Total
0 - 4	199	173	382	467	515	982
5 - 14	389	281	670	546	596	1142
15 - 24	396	179	575	1159	716	1875
25 - 34	268	165	433	3044	1068	4112
35 - 44	351	149	500	2598	601	3199
45 - 54	468	56	524	1031	219	1250
55 - 64	256	16	272	238	75	313
65 - 74	68	4	72	68	32	100
75 +	16	2	18	42	19	61
All ages	2411	1035	3446	9193	3841	13034

Sources: U.G. 28/1938 and 12/1942.

6. 1946 CENSUS

AGE GROUP	EUROPEANS			COLOUREDS		
	M	F	Total	M	F	Total
0 - 4	7666	7655	15321	11458	11427	22885
5 - 14	13787	13340	27127	20702	21373	42075
15 - 24	16488	16725	33213	15599	19928	35527
25 - 34	14267	15268	29535	10737	13307	24044
35 - 44	13179	14360	27539	8595	9994	18589
45 - 54	8765	10767	19532	5113	5981	11094
55 - 64	6151	8084	14235	2693	3585	6278
65 - 74	4788	5403	10191	1331	1834	3165
75 +	1742	2372	4114	738	1243	1981
All ages	86833	93974	180807	76966	88674	165642

AGE GROUP	ASIATICS			NATIVES		
	M	F	Total	M	F	Total
0 - 4	501	462	963	1126	1178	2304
5 - 14	679	658	1337	1295	1443	2738
15 - 24	627	511	1138	4435	2057	6492
25 - 34	646	399	1045	7678	2499	10177
35 - 44	404	259	663	4320	1442	5762
45 - 54	314	134	448	2018	622	2640
55 - 64	245	59	304	470	215	685
65 - 74	116	26	142	144	64	208
75 +	55	30	85	180	72	252
All ages	3587	2538	6125	21666	9592	31258

Source: U.G. 60/1950

7. 1951 CENSUS

AGE GROUP	EUROPEANS			COLOUREDS		
	M	F	Total	M	F	Total
0 - 4	8563	8362	16925	16014	16257	32271
5 - 14	14288	13964	28252	24638	25177	49815
15 - 24	15081	16341	31422	20464	24639	45103
25 - 34	13752	14253	28005	13472	16050	29522
35 - 44	13453	14857	28310	10076	12392	22468
45 - 54	10451	12364	22815	6718	8006	14724
55 - 64	6586	8730	15316	3254	4439	7693
65 - 74	4398	5985	10383	1559	2465	4024
75 +	2203	3029	5232	716	1208	1924
All ages	88775	97885	186660	96911	110633	207544

AGE GROUP	ASIATICS			NATIVES		
	M	F	Total	M	F	Total
0 - 4	568	609	1177			
5 - 14	833	656	1486			
15 - 24	753	569	1322			
25 - 34	655	437	1092	NOT AVAILABLE		
35 - 44	516	267	783			
45 - 54	281	134	415			
55 - 64	217	46	263			
65 - 74	154	15	169			
75 +	66	14	80			
All ages	4043	2747	6790	27092	13123	40215

Source: Figures kindly provided by Director of Census and Statistics, Pretoria.

APPENDIX B

CORRECTED BIRTHS AND BIRTH RATES. MUNICIPALITY OF CAPE TOWN. 1901-02 TO 1953-54.

(Rates per 1,000)

	EUROPEANS		NON-EUROPEANS	
	Live Births	Birth Rate	Live Births	Birth Rate
1901 - 02	945	25.3	1660	62.2
1902 - 03	927	24.8	1591	59.3
1903 - 04	1049	24.2	1672	50.2
1904 - 05	1020	24.0	1771	52.3
1905 - 06	937	23.3	1760	51.2
1906 - 07	920	24.2	1765	50.6
1907 - 08	777	21.6	1667	47.1
1908 - 09	796	23.4	1634	45.4
1909 - 10	780	24.2	1616	44.2
1910 - 11	762	25.0	1642	44.3
1911 - 12	734	24.4	1788	47.2
1912 - 13	739	23.2	1757	45.3
1913 - 14	1834	28.0	2750	45.5
1914 - 15	2390	29.9	3587	47.5
1915 - 16	2280	27.5	3696	48.2
1916 - 17	2420	28.2	2546	45.8
1917 - 18	2458	27.6	3629	46.3
1918 - 19	2206	23.8	3274	41.2
1919 - 20	2513	26.1	4172	51.7
1920 - 21	2526	24.3	3769	45.9
1921 - 22	2506	23.0	4262	50.7
1922 - 23	2397	21.4	4305	49.4
1923 - 24	2444	21.4	4458	49.5
1924 - 25	2538	21.2	4897	51.5
1925 - 26	2524	20.8	4580	47.5
1926 - 27	2540	20.5	5000	50.5
1927 - 28	2946	21.7	5587	49.3
1928 - 29	2929	21.5	5946	51.2
1929 - 30	2997	22.0	5924	49.7
1930 - 31	3004	21.3	6245	50.2
1931 - 32	2890	20.6	6379	50.9
1932 - 33	2522	17.8	6182	48.1
1933 - 34	2593	17.7	6648	50.5
1934 - 35	2469	16.6	6328	46.8
1935 - 36	2812	18.1	6782	48.0
1936 - 37	2635	17.2	6875	48.4

APPENDIX B

(continued)

CORRECTED BIRTHS AND BIRTH RATES. MUNICIPALITY OF CAPE TOWN. 1901-02 TO 1953-54.
(Rates per 1,000)

	EUROPEANS		COLOUREDS		ASIATICS		NATIVES	
	Live Births	Birth Rate	Live Births	Birth Rate	Live Births	Birth Rate	Live Births	Birth Rate
1937-38	2968	19.1	6386	48.1	193	54.2	351	37.1
1938-39	2886	18.5	6391	47.0	219	60.2	366	37.4
1939-40	3063	19.6	6535	46.9	177	47.6	398	39.5
1940-41	3028	19.2	6619	46.3	203	53.4	392	37.6
1941-42	3294	20.0	6345	42.5	198	49.9	442	40.3
1942-43	3483	21.1	6280	41.8	216	54.4	484	43.6
1943-44	3915	22.8	6977	45.3	229	56.6	454	39.6
1944-45	3608	20.6	6867	45.0	232	42.0	726	38.8
1945-46	3561	19.7	6956	44.6	240	41.0	777	38.4
1946-47	4068	21.9	8140	48.5	189	29.8	720	32.9
1947-48	3832	20.7	7858	45.1	301	44.1	785	32.6
1948-49	3721	20.3	8517	48.5	265	37.3	823	32.1
1949-50	3451	18.7	8497	43.6	322	48.8	967	36.9
1950-51	3346	18.0	8616	42.3	314	46.7	936	33.6
1951-52	3405	18.3	8818	41.5	365	53.3	1009	34.1
1952-53	3522	18.4	9064	39.9	309	43.2	1135	35.2
1953-54	3450	18.2	8872	38.1	375	52.4	1126	33.4

Source: M.O.H., Cape Town, 1901-2 to 1953-54.

The figures given by the M.O.H. for Natives do not include births in Langa Housing Scheme. These births in Langa were, however, included in the calculation of fertility rates in Chapter IV.

APPENDIX C

CORRECTED DEATHS AND DEATH RATES. MUNICIPALITY OF CAPE TOWN. 1901-02 TO 1953-54
(Rates per 1,000)

	EUROPEANS		NON-EUROPEANS	
	Deaths	Death Rate	Deaths	Death Rate
1901 - 02[x]	700	18.3	1401	44.4
1902 - 03	750	15.1	1421	42.6
1903 - 04	621	13.6	1209	35.1
1904 - 05	533	11.2	1056	29.8
1905 - 06	492	11.0	1274	35.6
1906 - 07	470	10.5	1043	28.5
1907 - 08	436	10.2	1011	26.7
1908 - 09	435	10.5	972	25.6
1909 - 10	454	11.4	1138	29.4
1910 - 11	454	11.5	1066	26.2
1911 - 12	468	11.4	1055	24.7
1912 - 13	480	10.3	1105	25.7
1913 - 14	425	12.1	1137	27.0
1914 - 15	1140	12.7	2245	28.4
1915 - 16	1064	11.2	2115	26.0
1916 - 17	1379	13.3	2666	32.7
1917 - 18	1202	11.5	2395	27.9
1918 - 19	2331	22.1	5559	66.1
1919 - 20	1242	11.0	2305	27.0
1920 - 21	1365	12.0	2653	30.6
1921 - 22	1230	10.7	2266	25.9
1922 - 23	1198	10.0	2440	26.9
1923 - 24	1250	10.2	2683	28.7
1924 - 25	1194	10.1	2511	26.9
1925 - 26	1114	9.6	2363	24.9
1926 - 27	1225	10.4	2736	28.1
1927 - 28	1380	10.5	3228	28.5
1928 - 29	1431	10.7	2964	25.5
1929 - 30	1468	10.7	2991	25.1
1930 - 31	1446	10.2	2998	24.1
1931 - 32	1526	10.8	3298	26.3
1932 - 33	1462	10.0	2818	21.9
1933 - 34	1363	9.2	3011	22.8
1934 - 35	1639	10.8	3350	24.8
1935 - 36	1665	10.7	3352	23.7
1936 - 37	1512	9.8	2769	19.5

x = uncorrected.

APPENDIX C

(continued)

CORRECTED DEATHS AND DEATH RATES. MUNICIPALITY OF CAPE TOWN. 1901-02 TO 1953-54
(Rates per 1,000)

	EUROPEANS		COLOUREDS		ASIATICS		NATIVES	
	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate
1937-38	1655	10.6	3116	23.5	56	15.7	247	26.1
1938-39	1614	11.5	2943	21.6	40	11.0	258	26.4
1939-40	1590	9.8	2777	19.9	48	12.9	221	21.9
1940-41	1674	10.1	3099	21.7	69	18.2	256	24.6
1941-42	1817	11.4	3454	23.1	58	14.6	330	30.1
1942-43	1855	11.7	3152	21.0	57	14.4	377	34.0
1943-44	1748	11.0	3574	23.2	85	21.0	412	35.9
1944-45	1762	10.2	3413	21.3	75	13.2	607	32.4
1945-46	1714	9.6	3154	19.2	62	10.3	586	29.0
1946-47	1709	9.3	3048	18.2	56	8.8	587	26.8
1947-48	1949	10.2	3327	19.1	76	11.1	611	25.4
1948-49	1761	9.1	3167	18.0	65	9.1	544	21.2
1949-50	1787	9.7	3125	16.0	58	8.8	557	21.3
1950-51	1774	9.5	2919	14.3	71	10.6	578	20.7
1951-52	1842	9.9	3045	14.3	59	8.6	628	21.2
1952-53	1789	9.3	2891	12.7	58	8.1	548	17.0
1953-54	1773	9.4	2762	11.8	61	8.5	533	15.8

Source: M.O.H., Cape Town, 1901-02 to 1953-54

The figures given by the M.O.H. for Natives do not include deaths in Langa Housing Scheme. These deaths in Langa were, however, included in the calculation of age specific mortality rates unless otherwise stated.

APPENDIX D

STANDARDISATION OF MORTALITY RATES, MUNICIPALITY OF CAPE TOWN, 1904 AND 1951

The crude mortality rates for Europeans and Coloureds for 1904 and 1951 have been standardised in two ways:-

1. Using 1951 European population data as the standard, and,
2. Using 1951 Coloured population data as the standard.

Data for deaths in 1904 are incomplete, so that death rates in the standard population cannot be calculated for the sexes separately, and are therefore standardised for age only.

METHOD 1: Using 1951 European population as standard.

STANDARDISATION OF 1904 MORTALITY RATES

AGE GROUP	EUR. POP. 1951	MORTALITY RATES		DEATHS THAT WOULD HAVE OCCURRED IN STANDARD POPULATION.	
		Eur. 1904	Col. 1904		
0 - 4	16925	47.0	162.9	795	2757
5 - 14	28252	3.5	7.1	99	201
15 - 24	31422	3.8	10.3	119	324
25 - 34	28005	6.1	17.2	171	482
35 - 44	28310	14.4	28.1	408	795
45 - 54	22815	26.0	33.7	593	769
55 - 64	15316	38.3	59.3	587	908
65 - 74	10383	93.3	87.9	969	913
75 +	5232	145.3	228.4	755	1187
All ages	186660			4496	8336

The death rates standardised for age are therefore:

Europeans, 1904 $\frac{4496 \times 1000}{186,660}$ = 24.1 per 1,000.

Coloureds, 1904 $\frac{8336 \times 1,000}{186,660}$ = 44.7 per 1,000.

STANDARDISATION OF 1951 COLOURED MORTALITY RATES

AGE GROUP	EUR. POP. 1951		MORT. RATES COL. 1951		DEATHS THAT WOULD HAVE OCCURRED IN STANDARD POP.	
	M	F	M	F	M	F
0 - 4	8563	8362	40.2	33.9	344	284
5 - 14	14288	13964	2.3	1.7	33	24
15 - 24	15081	16341	3.9	4.4	59	72
25 - 34	13752	14253	7.6	6.5	105	93
35 - 44	13453	14857	12.3	6.4	165	95
45 - 54	10451	12364	26.5	16.5	277	204
55 - 64	6586	8730	41.2	24.3	271	212
65 - 74	4398	5985	85.3	56.8	375	399
75 +	2203	3029	121.5	91.9	268	278
All ages	88775	97885			1897	1661
Sexes combined	186,660				3,558	

The standardised death rate for the Coloured population in 1951 is therefore $\frac{3558 \times 1000}{186660}$ = 19.1 per 1,000.

With a population of the same age and sex distribution, the Europeans in 1951 have a death rate of 9.5

METHOD 2: Using Coloured population of 1951 as standard.

STANDARDISATION OF 1904 MORTALITY RATES.

AGE GROUP	EUR. POP.	MORTALITY RATES		DEATHS THAT WOULD HAVE OCCURRED IN STD. POP.	
	1951	Eur. 1904	Col. 1904	Eur. 1904	Col. 1904
0 - 4	32271	47.0	162.9	1517	5257
5 - 14	49815	3.5	7.1	174	354
15 - 24	45103	3.8	10.3	171	465
25 - 34	29522	6.1	17.2	180	508
35 - 44	22468	14.4	28.1	324	631
45 - 54	14724	26.0	33.7	383	496
55 - 64	7693	38.3	59.3	295	456
65 - 74	4024	93.3	87.9	375	354
75 +	1924	145.3	228.4	280	439
All ages	207544			3699	8960

The death rates standardised for age are therefore:

Europeans, 1904 $\frac{3699 \times 1000}{207544}$ = 17.8 per 1000.

Coloureds, 1904 $\frac{8960 \times 1000}{207544}$ = 43.2 per 1000.

STANDARDISATION OF 1951 EUROPEAN MORTALITY RATES

AGE GROUP	COL. POP. 1951		MORT. RATES EUR. 1951		DEATHS THAT WOULD HAVE OCCURRED IN STANDARD POP.	
	M	F	M	F	M	F
0 - 4	16014	16257	7.1	4.4	114	72
5 - 14	24638	25177	0.6	0.4	15	10
15 - 24	20464	24639	1.1	0.7	23	17
25 - 34	13472	16050	1.2	1.5	16	24
35 - 44	10076	12392	4.8	2.8	48	35
45 - 54	6718	8006	10.0	7.0	67	56
55 - 64	3254	4439	24.6	11.9	80	53
65 - 74	1559	2465	56.6	34.7	88	86
75 +	716	1208	112.1	108.3	80	131
All ages	96911	110633			531	484
Sexes combined	207544				1015	

The standardised death rate for the European population in 1951 is therefore

$\frac{1015 \times 1000}{207,544}$ = 4.9 per 1,000

With a population of the same age and sex distribution, the Coloureds in 1951 have a death rate of 14.3 per 1,000.

APPENDIX E.

INFANT DEATHS AND MORTALITY RATES. MUNICIPALITY OF CAPE TOWN. 1901-02 TO 1953-54
(Rates per 1,000 live births)

	EUROPEANS		NON-EUROPEANS	
	Infant Deaths	I.M.R.	Infant Deaths	I.M.R.
1901 - 02	124	133.3	416	255.2
1902 - 03	158	168.2	228	307.5
1903 - 04	120	114.3	454	270.8
1904 - 05	121	118.6	416	234.8
1905 - 06	121	129.1	493	281.1
1906 - 07	84	91.3	373	211.3
1907 - 08	78	100.4	344	206.3
1908 - 09	71	89.2	342	209.3
1909 - 10	81	103.8	349	215.9
1910 - 11	81	94.7	349	206.4
1911 - 12	72	97.9	334	186.4
1912 - 13	76	102.7	349	198.6
1913 - 14	198	107.9	689	250.5
1914 - 15	240	100.4	805	224.4
1915 - 16	181	79.1	700	189.3
1916 - 17	233	96.2	805	226.7
1917 - 18	195	79.1	730	200.9
1918 - 19	253	114.6	975	297.8
1919 - 20	205	81.4	767	183.8
1920 - 21	268	101.5	899	231.7
1921 - 22	173	69.5	752	173.3
1922 - 23	196	80.4	861	196.4
1923 - 24	167	72.4	827	187.3
1924 - 25	170	71.9	838	173.9
1925 - 26	152	65.2	789	175.5
1926 - 27	161	67.4	918	186.6
1927 - 28	169	55.6	1065	162.0
1928 - 29	172	61.9	943	159.1
1929 - 30	178	58.9	948	161.9
1930 - 31	192	63.5	973	155.4
1931 - 32	192	68.4	1070	168.1
1932 - 33	126	46.8	887	142.5
1933 - 34	90	35.4	886	134.1
1934 - 35	125	50.7	925	147.4
1935 - 36	126	46.5	988	142.2
1936 - 37	123	53.1	749	123.0

APPENDIX E
(continued)

INFANT DEATHS AND MORTALITY RATES. MUNICIPALITY OF CAPE TOWN. 1901-02 TO 1953-54
(Rates per 1,000 live births)

	EUROPEANS		COLOUREDS		ASIATICS		NATIVES	
	Inf. Deaths	I.M.R.	Inf. Deaths	I.M.R.	Inf. Deaths	I.M.R.	Inf. Deaths	I.M.R.
1937-38	120	40.4	813	127.3	9	46.6	71	202.3
1938-39	121	41.9	786	123.0	10	45.7	66	180.3
1939-40	125	40.8	801	122.6	6	33.9	74	185.9
1940-41	108	35.7	840	126.9	15	73.9	74	188.8
1941-42	143	43.4	949	149.6	8	40.4	95	214.9
1942-43	148	42.5	756	120.4	11	50.9	111	229.3
1943-44	125	31.9	891	127.7	18	78.6	122	268.7
1944-45	125	34.7	781	113.7	12	51.7	130	198.2
1945-46	131	36.8	667	95.9	14	58.3	130	188.1
1946-47	110	27.0	759	93.2	14	74.1	204	283.3
1947-48	142	37.1	859	109.3	20	66.5	214	272.6
1948-49	109	29.3	866	101.7	19	71.7	180	218.7
1949-50	102	29.6	784	92.3	10	31.1	199	205.8
1950-51	80	23.9	787	91.3	18	57.3	223	238.3
1951-52	98	28.8	805	91.3	18	49.3	260	257.7
1952-53	75	21.3	818	90.3	11	25.6	236	207.9
1953-54	105	30.4	783	88.3	23	61.3	237	210.5

Source: M.O.H., Cape Town, 1901-02 to 1953-54.

The figures given by the M.O.H. for Natives do not include births and infant deaths in Langa Housing Scheme.

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