A Profile of the Speech Therapy and Audiology Clientele at a Tertiary Hospital in the Western Cape

Thesis presented in partial fulfilment of the degree of Master of Science in Speech-Language Pathology
Division of Communication Sciences and Disorders
Faculty of Health Sciences
University of Cape Town
Cape Town
March 2005

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Abstract

Title:	A Profile of the Speech Therapy and Audiology Clientele at a Tertiary Hospital in the Western Cape.
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Degree:	Master of Science in Speech-Language Pathology
Date:	March 2005

It became evident in the light of proposed changes in the healthcare system in South Africa that there was little descriptive client data with regard to Speech Therapy and Audiology Services in South Africa to support proactive service planning. This study therefore aimed to describe trends in the demographic, diagnostic, and attendance variables of first-time clients who had attended the Speech Therapy and Audiology out-patient department (OPD) at a tertiary hospital in the Western Cape over a five year period (1999-2003). A longitudinal, retrolective, descriptive survey was conducted. Records were reviewed for a sample of the population of all new clients who had attended the Speech Therapy and Audiology OPD in the five year time frame. Data was collected using a form designed for this purpose. The data was coded and then analysed descriptively.

It was found that the highest percentages of subjects attended for a hearing loss or voice disorder. The ENT department at the study hospital made the highest percentage of referrals to the Speech Therapy and Audiology Department. This was followed by referrals from the education sector. The age profile showed the highest percentage of subjects to be in the age category of 7-12 years. Similar percentages of male and female subjects were found. English was the language that a client was most likely to speak. Geographically the highest percentage of subjects attending were from the Klipfontein region, followed by the Central area. Attendance data showed that just over 70 % of subjects attended within a three month period or attended no more than two appointments. Percentage of appointments attended decreased with increasing numbers of booked appointments.

Implications of this research include issues around record keeping and service delivery. The results of this study cannot be generalized to all Speech Therapy and Audiology services in South Africa. However, the data may serve as a guide for planning services. Further research addressing service delivery issues is needed with the field of Speech Therapy and Audiology.

Key words: Speech Therapy and Audiology services, healthcare, service delivery, client profiles, attendance

Acknowledgements

I would like to express my sincere thanks to all the following people:

- Associate Professor Harsha Kathard for her continued support, advice and encouragement as my clinical supervisor for this study.
- Ms Pharyn Sorour and Ms Carol Legg for advice and supervision in the initial stages of this research.
- All the staff in medical records, who helped retrieve records for me.
- Jocelyn for your help with the validity check.
- Heather for your advice and interest in my research.
- Dr Isaacs for advice regarding data analysis
- To all the staff in the Speech Therapy and Audiology Department, who advised and helped me with this research.
- My parents for administrative help and support, and seeing me through the process.
- Andrew and Gina for administrative help and support.

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Chapter 1

Introduction and Literature Review

1.1. Introduction

This chapter provides a brief outline of this research study, explains how Speech Therapy and Audiology services are situated in South Africa and gives an overview of the historical context of healthcare in the public sector of South Africa. Healthcare will initially be reviewed nationally and then, more specifically, in the context of the Western Cape and in relation to disability, rehabilitation and Speech Therapy and Audiology Services. Relevant international and national literature regarding client profiles and attendance information are then discussed within a general healthcare context and within the context of Speech Therapy and Audiology Services. Against this backdrop the rationale for the study is given and explanations about selections of study variables are provided.

1.2. Overview of the study

This study describes the client population profiles of the Speech Therapy and Audiology out-patient department (OPD) at a tertiary hospital in the Western Cape in South Africa over a five year period (1999-2003). It examines trends and relationships between demographic, diagnostic and attendance data of the study sample. The impetus for this study arose from difficulties the researcher experienced while working as a Speech Therapist in a tertiary hospital in the Western Cape. One of these difficulties was high rates of client non-attendance for scheduled appointments. It became evident in the light of proposed changes in the healthcare system in South Africa that there was little descriptive client data with regard to Speech Therapy and Audiology Services in South Africa to support proactive service planning.

Situating Speech Therapy and Audiology services in South Africa

In the South African public sector, Speech Therapy and Audiology services have traditionally been located in both the health and education sectors. In the health sector these services have been considered as part of rehabilitation. Although rehabilitation services are essential, they are not extensive and fail to reach many people in need due to a lack of resources. Historically, most public sector rehabilitation services have been based in hospitals and special schools, with a minority of services available at community level (Rehabilitation, 2004). Most of the services in the Western Cape are urban based with few rehabilitation staff working in rural areas beyond the Cape Metropole (Rehabilitation, 2004). Health sector provision of Speech Therapy and Audiology services has mostly been limited to services at tertiary hospitals, with little available at primary or secondary levels in the Western Cape (Allied Health Professionals Technical Committee, 2004). Within the education sector, services are generally only available within special schools to learners enrolled at these schools (F. Lewis, personal communication, February 18, 2005). Thus, due to the fact that the Speech Therapy and Audiology Department at the tertiary hospital under study is in the public health sector, a historical context of healthcare in South Africa is necessary to place these services in context.

1.3. Public Service Healthcare in South Africa

A review of key characteristics of the South African healthcare context highlights the significant challenges facing the delivery of Speech Therapy and Audiology services in South Africa. Knowledge of these characteristics is important in order to meet these challenges. Understanding the context will result in the ability to develop and implement Speech Therapy and Audiology services that are best suited to this country (Swanepoel, 2005). A brief historical context of healthcare in South Africa will therefore be presented, followed by discussion of the changes that have taken place within the South African health sector. The specific contexts of the Western Cape, rehabilitation services and then Speech Therapy and Audiology services will be considered.

Historical Context of Healthcare in South Africa

Historically, rehabilitation services in South Africa were structured along the ideals of the medical model and complied with apartheid ideology (Bhagwanjee and Stewart, 1999; Department of Health: Health Sector Strategic Framework, 1999-2004; Office of the Deputy President, 1997). Therefore public health services were characterised by racial and geographical disparities, fragmentation and duplication and were hospital centred with little attention paid to the Primary Healthcare Approach (Department of Health: Health Sector Strategic Framework, 1999-2004; Segall, 1999). This resulted in an inequitable provision of services in terms of accessibility, appropriateness, funding and co-ordination across the variables of race, class, gender and level of urbanisation (KwaZulu-Natal Department of Health, 1997 as cited in Bhagwanjee and Stewart, 1999). The healthcare system was divided, inefficient and grossly inequitable (Hall, Haynes and McCoy, 2002). The development of Speech Therapy and Audiology Services in South Africa has been shaped by this context (Pillay, Kathard and Samuel, 1997).

The effectiveness of the public sector health services has been undermined by this inequity in service provision and the resulting geographical maldistribution of resources (O'Leary, Govind, Schwabe and Taylor, 1998). There is a relatively heavy concentration of healthcare resources within the tertiary level hospital sector and consequent under-resourcing of primary healthcare services. A lack of timeous and appropriate medical care and rehabilitation, as well as premature discharge, has contributed significantly to an increase in preventable secondary and tertiary disabilities (Office of the Deputy President, 1997; Allied Health Professionals Technical Committee, 2004) and increased morbidity (Allied Health Professionals Technical Committee, 2004). Rehabilitation services have traditionally been neglected in South Africa (Office of the Deputy President, 1997).

In a similar way, disability issues have been addressed in a piecemeal, fragmented fashion in South Africa (Office of the Deputy President, 1997; Bhagwanjee and Stewart, 1999) resulting in very little progress being made to equalize the status of people with disabilities, especially those living under severe socio-economic constraints (Bhagwanjee and Stewart, 1999). This therefore affects the majority of disabled people, who are overrepresented in more poverty-stricken areas

(Office of the Deputy President, 1997). People also do not have accurate information about disability, its causes, prevention and treatment (Office of the Deputy President, 1997). This is one of many reasons resulting in the rising numbers of people with disabilities and their consequent isolation from the mainstream of society. Disability is a global phenomenon of huge proportion, eliciting growing local, national and international concern (Bhagwanjee and Stewart, 1999).

Access to appropriate rehabilitation services can make the difference between leading an isolated and economically dependent life or leading an economically independent life and playing an active role in society (Office of the Deputy President, 1997). Given the high prevalence of people with communication disabilities, together with the role played by communication in enhancing the quality of life, it is essential to develop service strategies to support people with limited communication ability (Hartley and Wirz, 2002).

Apart from the lack of facilities, the financial burden of finding and financing transport to health facilities and payment for health services (Department of Health: Health Sector Strategic Framework, 1999-2004; McIntyre, Bloom, Doherty and Brijlal, 1995), as well as staff shortages, inconvenient opening hours and poor service quality (McIntyre et al., 1995) have acted as barriers to accessing care. A negative socio-economic situation also causes individuals' priorities to move away from habilitation, or rehabilitation, to the more basic needs of daily provision and stability (Swanepoel, 2005).

It is clear that the majority of South Africans will continue to depend on the public health system for the foreseeable future. Also, the high levels of unemployment and poverty suggest that this majority of clients will not be able to make any significant contribution towards the cost of their healthcare (Department of Health: Health Sector Strategic Framework, 1999-2004). Therefore Speech Therapy and Audiology Services need to be aware of systemic and historical problems and be re-structured to meet the needs of this population. By knowing more about the specific population already being seen in the Speech Therapy and Audiology Department at the study hospital and attendance patterns, services can be planned more appropriately.

Changes in the Healthcare System

Over the last couple of years, however, changes have taken place within the health system in general, including Speech Therapy and Audiology Services. Since South Africa's first democratic elections in 1994, the National Department of Health set about transforming and restructuring the healthcare system (Hall et al., 2002; Forman, Pillay and Sait, 2004). These changes have included a move towards a Primary Health Care Approach (PHC) within a District Health System (DHS), and a move from the medical model of healthcare to the social model. The aim has been to improve the quality of care provided and create a more equitable service. These issues will now be discussed in more detail.

Transformations have begun to take place within the public health system (Segall, 1999; Department of Health: Health Sector Strategic Framework, 1999-2004; Forman et al., 2004). The Primary Health Care Approach (PHC) and the District Health System (DHS) are two of the conceptual frameworks guiding this transformation (Hall, et al., 2002). By solid co-operation at a policy level between national and provincial health departments, supported by others inside and outside government, a national health system has been created (Department of Health, 1999-2004). The policy of Primary Health Care now commands universal support (Segall, 1999; Department of Health: Health Sector Strategic Framework, 1999-2004). Key objectives of the National Planning Framework include ensuring equity of access to appropriate hospital services for all South Africans and to ensure that hospital care is provided in the level of facility most appropriate to the level of care needed (Department of Health: Health Sector Strategic Framework, 1999-2004). The White Paper on an Integrated National Disability Strategy (Office of the Deputy President, 1997) states that there must be movement to primary level of the historically secondary level services, including basic rehabilitation.

Within this context of restructuring there has been a move from the medical to the social model of healthcare. This move has been seen in services for disabled people, including rehabilitation services. Where the medical model viewed disability as a health and welfare issue, the social model suggests that the collective disadvantage of disabled people is due to a form of discrimination, which is the basis to how society thinks and operates (Office of the Deputy President, 1997). The social model of disability proposes a more central role for disabled people

in the planning, development, implementation and monitoring of rehabilitation services. To achieve its aims, the rehabilitation process requires a number of supportive services, but its impetus must come from community action and involvement. Community-based rehabilitation should, therefore, form the basis of the national rehabilitation strategy, supported by secondary and tertiary rehabilitation services (Office of the Deputy President, 1997). Appropriate, accessible and affordable health services at primary, secondary and tertiary level are essential to the equalisation of opportunities for people with disabilities (Office of the Deputy President, 1997).

Along with these changes in healthcare, the issue of quality needs to be addressed. In this regard the National Department of Health's vision is to create access to affordable and good quality healthcare for all South Africans (National Department of Health Strategic Plan, 2003/04 to 2005/06). Healthcare providers, as well as health service users, have a critical role to play in achieving this (Department of Health: Health Sector Strategic Framework 1999-2004). Most Speech Therapists and Audiologists are committed to providing the highest quality of care to every client they serve. They are bound by professional and ethical considerations to maintain, as well as continuously improve, the quality of their services (Klop, 1998). However, due to the apartheid context of Speech Therapy and Audiology Services, equitable provision of high quality services has not always been provided (Pillay et al., 1997). This issue of quality, therefore, needs to be addressed within the field of Speech Therapy and Audiology. Part of quality is to ensure planning and equity of services at appropriate levels of care. Thus examining a profile of clients who have been attending existing services is a starting point towards achieving necessary changes.

Western Cape Health Services

At a regional level in the Western Cape, being mindful of the healthcare context and issues around quality, the need to restructure service delivery is a priority, given the current health crises. Many citizens and health professionals are unhappy with various aspects of the health service (Western Cape Department of Health, 2002) and the service is not financially sustainable in its present format. In response, a conceptual framework for change, Healthcare 2010, has been formulated.

Healthcare 2010 aims to ensure equal access to quality healthcare. This plan is to work towards reshaping the services to focus on primary level services, community-based care and preventative care (Health Western Cape, 2003). These services must be adequately backed up by well-equipped secondary and highly specialized tertiary services. This framework has the potential to deliver a health service that is accessible to all, offers quality care and is affordable. Facilities will need to be staffed appropriately and a revision of the existing staff establishment will be needed. It is anticipated that about 5000 staff will be relocated and/or re-skilled over the eight-year period as a result of the restructuring process, which will affect all professions (Health Western Cape, 2003). While attention is given (amongst other things) to the implementation of home-based care and the de-institutionalisation of patients from chronic facilities, Healthcare 2010 is relatively silent in respect of rehabilitation (Allied Health Professionals Technical Committee, 2004).

Rehabilitation Services in the Western Cape

Since 1994 rehabilitation has slowly emerged from the obscurity of the past. However, with regard to service delivery, the situation remains comparatively unchanged (Allied Health Professionals Technical Committee, 2004). Rehabilitation service provision is characterised by poor coverage at all levels of care, with the majority of the population in need (particularly those in rural areas) still having little or no access to services. Inadequate rehabilitation resources at both primary and secondary levels results in an inability of tertiary and regional secondary facilities to transfer patients to appropriate rehabilitation services (Allied Health Professionals Technical Committee, 2004). Premature discharge results in increased morbidity and the development of secondary complications, increased duration of rehabilitation, poorer outcomes, and ultimately, increased mortality (Allied Health Professionals Technical Committee, 2004). The services that are provided are not sufficient to serve the needs of the population.

Reliable regional and provincial epidemiological data on the incidence of disabling conditions is not readily available, and no easy basis exists for determining rehabilitation service needs or informing service planning (Allied Health Professionals Technical Committee, 2004). Available statistics generally reflect only the prevalence of disability and are an unreliable indicator of the

wide range of rehabilitation-related health needs (Allied Health Professionals Technical Committee, 2004). Thus research is needed in this area and client profiles can help to identify some of these needs. This study aims to achieve this with regard to Speech Therapy and Audiology services.

It is undeniable, however, that the demand for rehabilitation services (medical, social, educational and vocational) will continue to grow as the population ages, as the healthcare system continues to save and extend lives, and while the majority of the population in our communities live in poverty (Allied Health Professionals Technical Committee, 2004). Further improvements in healthcare, in line with Healthcare 2010, are also likely to increase the demand for rehabilitation (Allied Health Professionals Technical Committee, 2004). In addition, while key Healthcare 2010 projects such as home-based care and the utilization of step-down facilities may aid health facilities, these programmes will not reduce the need for rehabilitation (Allied Health Professionals Technical Committee, 2004). Healthcare 2010 provides an opportunity for the Western Cape to implement a coherent, comprehensive rehabilitation strategy at all levels of healthcare service delivery (Allied Health Professionals Technical Committee, 2004). However, in planning services, there are many challenges to be faced. These include issues around equity, appropriate levels of care, large numbers of clients in relation to staff and facilities, language and how to deal with imbalances in referral of clients.

Speech Therapy and Audiology Services

The current dissatisfaction in the health sector is also noted in the Speech Therapy and Audiology professions, especially as it relates to the issues of equity and quality (Pillay et al., 1997). Speech Therapy and Audiology Services in South Africa have been inequitable and remain biased toward providing a better quality service to a White, English and Afrikaans first language speaking population, whilst at the same time providing a poorer service to a Black African first language speaking clientele (Pillay, 1996 as cited in Pillay et al., 1997). Within the Western Cape, the majority of Speech Therapy and Audiology Services in the public health sector are at a tertiary level, limiting the access and availability of services to the majority of the population. The issues of accessibility and language in relation to Speech Therapy and Audiology services have a negative impact on the relevance of these services to society (Klop, 1998). The survival of

Speech Therapy and Audiology as a profession in South Africa depends on demonstrating in concrete ways that the majority of the population benefits from its services (Klop, 1998). This proves difficult because of the multilingual and multicultural characteristics of South Africa, where delivering linguistically and culturally appropriate services to the majority of the population is a significant challenge (Swanepoel, 2005).

A survey in 1995 of public health sector services in the Western Cape suggested that there were no Speech Therapists or Audiologists at a primary level of care (Ministry of Health and Social Services, Western Cape Province, 1995). Little has changed in this regard. The situation is untenable given the prevalence of disability in the Western Cape which is 4.1 percent of the population (Health Systems Trust, viewed 17 May 2004). In the city of Cape Town alone there are 3802 people with a communication disability, 14341 with a hearing disability, and a further 12 358 with multiple difficulties, which may include communication or hearing disabilities (Statistics South Africa, viewed June 2004). These figures are based on self-reported disability, which remains difficult to interpret. Also because of the way this data was collected there is some concern that the prevalence of disabilities was underestimated (personal communication with Statistics South Africa, 2003 as cited in McLaren, Solarsh and Saloojee, 2004). This data, despite its limitations, points to the need for Speech Therapy and Audiology services. Thus the need for accessible services, coupled with appropriate planning, is essential to meet the rehabilitation needs of this population.

The above issues indicate a need for restructuring of Speech Therapy and Audiology services. The limited service provision dictates who will utilise or be able to utilise Speech Therapy and Audiology Services. Thus, by studying profiles of clients attending a Speech Therapy and Audiology service, one can use this information to assist in planning services to meet some of the challenges outlined above.

1.4. Literature Review

Within the field of Speech Therapy and Audiology, several studies have examined client profiles. Internationally these include studies by Broomfield and Dodd (2004), Edwards, Cape and Brown (1989), Enderby and Davies (1989), Enderby and Petheram (2000), Heron (2001) and Petheram

and Enderby (2001). Nationally there is limited research, apart from studies by Klop (1998), Schneider (1992) and Swanepoel (2005). The unique characteristics and challenges of developing countries demand that contextual research be done in conjunction with international studies (Swanepoel, 2005). These international and national studies will now be considered in some detail.

Studies examining similar demographic and diagnostic variables to those in the current study have been conducted by Enderby and Petheram (2000) and Petheram and Enderby (2001), after speculation that the changes in the National Health Service (NHS) in the United Kingdom in 1992 had an impact on Speech and Language Therapy referrals. These changes involved the introduction of National Health System (NHS) purchasing and contracting and the reduction of referral routes to Speech and Language Therapy (Enderby and Petheram, 2000). It had also been felt that the increasing number of GP fund holders since 1993 may have influenced the patterns of referrals. Issues with regard to the awareness of certain disorders and their implications, may have influenced the actions of those in a position to refer and may have led to more referrals to Speech and Language Therapy for clients with certain disorders and a reduction in referrals of clients with other disorders.

Enderby and Petheram (2000) and Petheram and Enderby (2001) retrospectively examined data collected by eleven Speech and Language Therapy healthcare providers in the UK from 1987 to 1995, a period of 9 years. Their data was collected from a computer system and then analysed descriptively. Enderby and Petheram (2000) used this data to analyse numbers and sources of referrals, while Petheram and Enderby (2001) investigated the age, gender, medical diagnoses and Speech and Language Therapy diagnoses associated with the referral of these clients. The clinics that they examined were solely Speech and Language clinics (i.e. not Audiology). Their findings showed changes in the service over time in some aspects, such as referrals, referral sources, medical diagnosis, and the age of population attending Speech Therapy, whereas others remained constant, for example gender balance.

Across all the eleven research sites in this study by Enderby and Petheram (2000) there was an increase in referrals between 1987 and 1995 and twenty-four sources of referrals made up 96% of referrals to Speech and Language Therapy. The top referrers in their study were health visitors, educational services, ENT surgeons, GPs, geriatric medicine and general medicine. There were

more than 75 medical diagnoses associated with referral to Speech and Language Therapy (Petheram and Enderby, 2001). The most significant proportional increase of the caseload was related to referrals associated with cerebral vascular accident (CVA), although a significant increase was also found in the area of phonatory voice disorders. A decrease in the number of referrals that did not have a medical diagnosis was also observed. The Speech diagnoses of dysarthria, dysphasia, dysphonia, dysphagia, speech and language disorder, speech and language delay, and speech disorders associated with palatal disorders/dysfunction accounted for around half of those referred to Speech and Language Therapy in this time period. The most noticeable increase was in the number of referrals for dysphagia (Petheram and Enderby, 2001).

The gender balance of patients in their study remained relatively consistent over the period of time with about two females referred to every three males (Petheram and Enderby, 2001). A reduction in referrals of children under 5 was noted over time with an increase in all other age groups, especially the elderly population.

Heron (2001) described the need for Speech Therapy services in a section of London and looked at patterns of referrals. Referrals to a paediatric speech and language therapy service in the UK were also examined by Broomfield and Dodd (2004). They obtained data through assessments of clients and gathering information from the clients. Edwards et al. (1989) examined age of referral, family characteristics, gender and source of referral from a selected paediatric population attending Speech Therapy services. They then drew up a profile of the type of child most likely to be referred routinely for Speech Therapy.

None of the above studies, however, examined attendance patterns. An article examining data from a multimethod study of Speech and Language Therapy for pre-school children (Roulstone, Glogowska, Peters and Enderby, 2004) included information regarding attendance with respect to percentage of appointments cancelled or failed. They found that nearly 18 % of appointments were cancelled or not attended.

Enderby and Davies (1989) reviewed the available epidemiological data on the size of the speech and language impaired population in the United Kingdom. They indicated that each year Speech Therapy services can expect to receive 364 new referrals for children per 100 000 population, of which 60 % will need assessment and advice only, 38% will require assessment and counselling

plus regular Speech Therapy, with a further small proportion needing intensive therapy (several times a week).

The above discussion of data collected from Speech and Language Therapy services in the United Kingdom helps to provide some context for research in the area of client profiles and service provision in the field of Speech Therapy or Speech Therapy and Audiology, but has little contextual application in South Africa. Three relevant studies carried out in South Africa will now be reviewed (Klop,1998; Schneider, 1992 and Swanepoel, 2005).

Schneider (1992) collected data from records, reports and case files to determine the nature and prevalence of communication disorders seen in six hospitals in Gazankulu. Community Speech and Hearing Workers were then interviewed about their work situation, organisation of their time and intervention strategies used with communicatively disordered people in order to evaluate the efficacy of their work. They found the most common disorders seen were hearing disorders.

An exploratory descriptive study critically described an infant hearing screening programme conducted at two Maternal and Child Health clinics in Hammanskraal (Swanepoel, 2005). Quantitative and qualitative methods for data collection were used.

Limited evaluation research has been conducted in the area of quality management relating to a private healthcare practice (Klop, 1998), where basic information needed to develop and implement quality management programmes was provided. This study looked at client profiles in terms of disorders, age, geographical location, gender, home language and referral agents. Data was compiled from 197 clients seen by the researcher in her practice from 1994 to 1996. As this practice deals with a different clientele from those at the study hospital, the profiles would be expected to be different from the results of the current study.

Due to the limited amount of research about client profiles of Speech Therapy and Audiology Services, other studies examining client profiles within the healthcare domain were examined (these include Atkinson, Misra, Ryan and Turner, 2003; Burge et al., 2002; Chidiac et al., 2001; De Geest, Moons, Dobbles, Martin and Vanhaecke, 2001; Fernandes et al., 2002; Levy, Los, Chevalier and Levy, 2001). These studies alerted the researcher to various methods that have been used for data collection when examining client profiles. These included prospective and

retrospective means of gathering data from hospital databases, clinical records, electronic databases, specially designed records or databases, self-reports, electronic event-monitoring data, structured interviews, questionnaires and surveys.

A study which examined attendance information at a University Psychology Clinic in the USA (Renk and Dinger, 2002) collected data concerning number of sessions attended. This was done by examining case files and determining the information on attendance by the number of sessions documented by the therapists in their case notes, or by number of sessions listed on pay-sheet records. The former approach is similar to that which was used in the present study.

In a South African context, researchers looked at profiles of patients attending the Alexandra Health Centre. In this study, Ferrinho and Phakathi (1991) looked at trends of sex, age and address at different times. Information was collected from patient medical record cards. Another study looked at a profile of patients attending the physiotherapy department at the Alexandra Health Centre and University Clinic (Ferrinho, Cornielje and Reinach, 1992). A standard form was used to collect data. Data included age, sex, diagnosis, source of referral to the physiotherapy department, as well as referral from the physiotherapy department to other services.

At a local level several studies have been conducted in the Western Cape. London and Bachmann (1997) investigated paediatric utilisation of a teaching hospital and a community health centre to predict the level of care used by children from Khayelitsha in Cape Town. A semi-structured interview and record review were used to collect data. Lachman and Stander (1990) studied patterns of referral to Red Cross War Memorial Children's Hospital in Cape Town. They studied referral letters and basic demographic information obtained from the standard hospital sticker.

Kyriacos (1993) conducted a study at Groote Schuur Hospital cardiac clinic of patient attendance and non-attendance following heart valve replacement surgery and described similarities and differences in selected factors between attenders and non-attenders. She used various means for collecting data on socio-demographic variables and medical-diagnostic factors. These included using the computer, cardiac clinic records, hospital folder, operating theatre register, computerized valve programme and the cardiac surgical ward diary. An interview with each

subject was then conducted to provide data about study subjects' patterns of interactions with the healthcare facility. Some differences in socio-demographic data were found between the attenders and non-attenders.

Another study conducted at Groote Schuur Hospital examined the follow-up of stroke patients (Whitelaw, Meyer, Bawa and Jennings, 1994). Information regarding referral rates and number of sessions attended by patients was obtained from the relevant records.

The above studies used a variety of methodologies for retrieving data on patient profiles and attendance information. Now that relevant literature has been discussed and the context of healthcare in South Africa has been examined, the focus will be turned to the importance of the current study and the choice of variables to be studied.

1.5. Rationale for this study

As South Africa's professional resource base, health workers have a responsibility to use their research capacity in order to advance and implement emerging policy imperatives within the context of national reconstruction and development (Bhagwanjee and Stewart, 1999). Thus in order to ensure the cost-effective improvement and development of existing health services, the efficacy of rehabilitation programmes needs to be validated through research showing that such services are necessary, appropriate and accessible, within specified contexts (Bhagwanjee and Stewart, 1999). The current research results can contribute to an ongoing process of planning and development of relevant and innovative interventions, particularly in disadvantaged community settings (Alston and Mngadi, 1992 as cited in Bhagwanjee and Stewart, 1999). The compilation and analysis of data, timeous reporting and use of consistent up-to-date health information, are all key aspects of healthcare planning and management (Ijumba and Day, 2004). To a large extent, lack of information has contributed significantly to the slow process of transforming the health system (Ijumba and Day, 2004).

This lack of reliable information impacts severely on the planning and development of services and intervention strategies aimed not only at preventing disability, but at creating an enabling environment for the equalization of opportunities (Office of the Deputy President). It is

important to ensure that the information gathered is relevant to inclusive development planning, and to initiate a process of gathering data on social indicators and income inequality as it pertains to people with disabilities.

Speech Therapy research in the United Kingdom has emphasised the importance of gathering information on services and client populations for Speech Therapy services. As with South Africa, inequalities in services for the speech and language impaired in the National Health Service in the United Kingdom have been documented (Enderby and Davies, 1989). These inequalities in services are probably due to services being grown on the basis of local argument and history rather than on objective studies and information (Enderby and Davies, 1989). However, if there is to be efficient planning in healthcare it is important that this process be informed with regard to the size and needs of the population to be served (Enderby and Davies, 1989). The collation of client data profiles may serve in questioning some of the basic premises regarding provision of services. This suggests that the inability to offer an equitable service should lead to consideration of alternative forms of provision which meet the needs of the speech and language disabled population (Enderby, 1989). To monitor equity, comparative data need to be available by race, age, gender, urban/rural location and socio-economic status (Ntuli and Day, 2004). The first steps however, are to collect data from current service sites.

The demographic, diagnostic and attendance data of clientele currently receiving services at a tertiary level can be valuable in planning more equitable and appropriate services. Reliable data concerning the types of speech and language disorders referred, age and sources of referral, and the effect of cultural and socio-economic profiles of the population on referral patterns are vital for planning services (Broomfield and Dodd, 2004).

The identification and analysis of demographic information is an important basis for evaluating and planning rehabilitation services (Blake, 1981). Research into the patterns of morbidity, particularly across demographic variables, would inform planning for provision of appropriate, accessible and relevant service delivery and allied human resource development within the context of the emergent District Health System (Ministry of Health, 1997 as cited in Bhagwanjee and Stewart, 1999). Comparison of records may show service trends, admission patterns and familial trends (Lubker and Tomblin, 1998). Therefore it is important to collect data in a longitudinal manner so that changes in service provision can be examined in order to inform

debate and planning (Petheram and Enderby, 2001). Thus the value of this study, with its focus on demographic, diagnostic and attendance data, as a tool that may facilitate change within the healthcare system with regard to Speech Therapy and Audiology services, ought to be clearly seen.

The present study focuses on only one of the two groups of clients seen by Speech Therapists and Audiologists. The two groups are new referrals and the existing caseload. New referrals need to be assessed and some of them will require continuing Speech Therapy on a regular, intensive or minimal basis (Enderby and Davies, 1989). The focus of this study is on new referrals only, in other words, the new clients each year who attended the Speech Therapy and Audiology OPD at the tertiary hospital under study. This hospital treats adult and paediatric clients with a wide range of disorders. In-patients are treated as well as out-patients, although out-patients have been the focus for this study. In-patients were not included due to the different nature of the service provided to them and lack of client lists for these patients. Due to the provision of both Speech Therapy and Audiology services within this department, clients attending for either one of these services have been included in this study. This is unlike many of the other studies reviewed, which only included Speech Therapy clients.

The description and comparison of disease occurrence and its distribution in population groups according to characteristics of persons, place, time and family (WHO, 1992) provide useful information. In this study the variables of place (Speech Therapy and Audiology Department at the tertiary hospital being studied) and time (1999-2003) have been set by the researcher. Demographic factors that are often used in research include variables such as age, gender, marital status, family status, family life cycle stage, education, employment, occupation, income, and residential location and type, among others (Alreck and Settle, 1995). From these, the variables which are relevant and appropriate for the planning of services, as well as being readily available information, were selected. These are geographical location, age, gender, home language, employment status, marital status and family income (Kyriacos, 1993; Dick, 1994). Knowing patient residential addresses is important in order to redirect resources geographically as necessary (Ferrinho and Phakathi, 1991).

This demographic information then also provides the context in which to place the diagnostic variables of medical and Speech Therapy and Audiology diagnoses and referral sources. Speech,

language and hearing disorders form a heterogeneous group of disorders and are often secondary to a variety of underlying medical or surgical problems or else are part of a general or specific developmental disorder (Enderby, 1989). These diagnostic variables also allow one to reflect upon changes in the medical diagnoses associated with referrals to Speech Therapy and Audiology services as well as changes in Speech Therapy and Audiology diagnoses over time (Petheram and Enderby, 2001). This information about diagnoses will allow for services to be designed to meet the needs of the clients. The practitioner should also identify referral sources and look for ways to expand the referral base (Klop, 1998). The livelihood of any practice depends on the referral of clients from the community by doctors, psychologists, educators and other paramedical professions (Klop, 1998). It is also important to relate the diagnoses to demographic data to determine the need for specific services in certain geographical areas. This information will need to be considered in the light of changes which have already taken place in the healthcare service over the same time period. For the purposes of strategic planning a practice has to consider its practice environment and this information includes a description of the client base as well as environmental variables (Brown, 1994). Thus in the planning of services within the Western Cape and at the tertiary hospital being studied, information regarding the population served is necessary.

It is also important to explore ways of restructuring services to improve the attendance rates for clients accessing Speech Therapy and Audiology services in the Western Cape, at the tertiary hospital under study and at other levels of care. Non-attendance at out-patient clinics is a worldwide problem and rates of 44.2% have been recorded in the United States of America (Shepard and Mosely, 1976 as cited in Kyriacos, 1993) and 30% in the United Kingdom (Davies, 1984 as cited in Kyriacos, 1993). Out-patient non-attendance is a common source of inefficiency in healthcare provision, wasting time and resources and potentially increasing the length of out-patient waiting lists (Hardy, O'Brien and Furlong, 2001). Missed appointments represent a financial loss to the service and healthcare loss for those in need of intervention services, and can result in discharge without receiving an assessment (Phillips, 2004). This often occurs in the context of long waiting lists for initial appointments. Data concerning relationships between socio-demographic data and non-compliance by patients has been examined in the South African literature (e.g. Kyriacos, 1993; Dick, 1994). The socio-demographic variables studied in relation to non-compliance include age, gender, education, occupation, income, marital status, ethnic background, religion and socio-economic status (Kyriacos, 1993; Dick, 1994). The most

apparent result of clients' failure to adhere to health professionals' recommendations is that they do not receive the full benefit of the expertise of their healthcare providers (Stone, 1979). In this study, attendance data to be considered will include the number of sessions attended, percentage of appointments attended and the time frame over which these sessions occurred.

Thus the value of a study addressing issues of demographics, diagnoses and attendance can be seen for planning purposes. This study aims to achieve this on a small scale within the Speech Therapy and Audiology profession.

1.6. Summary of Chapter 1

This chapter has outlined Speech Therapy and Audiology services and placed them in the context of healthcare in South Africa, the Western Cape and within rehabilitation services. The literature review highlighted international and national literature around issues of service provision and client profiles in the field of Speech Therapy and then more generally within the healthcare domain. Methodological issues of these studies were considered and where appropriate results were mentioned. Finally a rationale and variables chosen for the study were discussed.

Chapter 2

Methodological Issues

2.1. Introduction

This chapter begins with the aims of the study, followed by a description of the research design. The study population and sampling are explained and the materials used are described. The data collection and management procedures are laid out. Thereafter a section on data analysis is presented. Reliability and validity issues are discussed, as are ethical issues. Finally, issues of reporting and implementation are mentioned.

2.2. Aims of the Study

2.2.1. Main Aim

This study aims to describe trends in the demographic, diagnostic, and attendance variables of first-time clients who have attended the Speech Therapy and Audiology out-patient department (OPD) at the tertiary hospital being studied over a five year time period (1999-2003).

2.2.2. Specific Aims

2.2.2.1. To examine the profile of the clients who have attended the Speech Therapy and Audiology department of the tertiary hospital being studied for the first time as an out-patient from the beginning of 1996 to the end of 2003 in relation to the following variables:

2.2.2.1.1. Diagnostic variables

a) Speech-Language or Audiology diagnosis

b) Medical diagnosis (related to Speech-Language or Audiology Diagnosis)

c) Referral sources

2.2.2.1.2. Demographic variables

d) Age

e) Gender

f) Home language

g) Occupation

h) Marital Status

i) Family income

j) Geographical location of residence

2.2.2.1.3. Attendance

k) Number of appointments attended

l) Percentage of appointments attended

m) Period of time over which attended the department

2.2.2.2. To determine associations between the following variables:

a) Speech therapy or Audiology disorder and referral sources (a - c)

b) Speech therapy or Audiology disorder and family income (a – i)

c) Speech therapy or Audiology disorder and home language (a - f)

d) Speech therapy or Audiology disorder and gender (a - e)

e) Speech therapy or Audiology disorder and geographical location (a - j)

f) Speech therapy or Audiology disorder and attendance (g – k and g – m)

g) Referral sources and geographical locations (c - j)

h) Speech therapy or Audiology diagnosis and related medical disorder (a - b)

2.3. Research Design

A longitudinal, retrolective (i.e. using previously recorded data) (Abramson, 1990), descriptive survey was conducted. A longitudinal study examines data over a period of time. This study design was suited for this research because the data could be gathered from hospital files. It involved little expense in collecting the data and allowed historical trace of information (Katzenellenbogen and Joubert, 1997). A descriptive survey sets out to describe a situation

(Abramson, 1990) and thus provides data about events or changes during a period of time. Surveys are well suited to descriptive studies in which an attribute, opinion or characteristic is evaluated (Robson, 1993). This study uses a survey to collect demographic, diagnostic and attendance data of a sample of clients.

2.4. Study population and Sampling

2.4.1. Subject selection criteria

- The study population included all the hospital records of new clients who had attended the Speech Therapy and Audiology OPD of the tertiary hospital under study during a 5 year period.
- Only new clients' records were included, as the departmental filing system only captured a client when they first attended (although this has recently changed with the introduction of a computer system to capture all attendances). Information from there on regarding treatment was captured within the hospital records.
- The period under study was from 1 January 1999 to the 31 December 2003. This period of time was selected as data was readily available and would give a sufficiently large number of records for trends across years to be examined.
- The number of new clients who attended each year is shown in Table 2.1, with a total of 2819 new clients over the 5 year period. A year is defined as 1st January to 31st December.
- Due to the large number of clients in the population, a sample of 1/3 of the population data was drawn (see 2.4.2.). The analysis was, therefore, conducted on this sample.

TABLE 2.1

Population size and initial and final sample sizes for each year from 1999 to 2003 and for the 5 year period

Year	Number of clients in population	Number of clients planned to be in sample	Final number in sample (after duplicates removed)
1999	596	198	197
2000	541	180	179
2001	565	188	188
2002	569	189	189
2003	548	183	178
5 Year Period	2819	938	929

2.4.2. Sampling method and procedure

A stratified random sampling procedure was used to select records of clients. Each client's record therefore had an equal probability of being selected (Joubert and Katzenellenbogen, 1997). A two stage sampling procedure was followed.

- Firstly, the population of clients' records was stratified according to the year in which the client was first seen.
- Secondly, the required number of clients' records was selected from within each stratum. Stratifying the sample was important to allow for comparisons across years.

The sample size was a third of the population, yielding a total sample size of 938, varying from 180 to 198 within each stratum. Surveys do not usually sample more than about a thousand people, even when the results are generalized to many millions and most surveys include only a few hundred respondents (Alreck and Settle, 1995). There are maximum and minimum practical sample sizes that will apply to almost all surveys (Alreck and Settle, 1995), with the minimum being about 100 and the maximum about 1000. It is seldom necessary to sample more than 10 percent of the population to obtain adequate confidence. However, the more the respondents are likely to differ on the key items of the survey the larger the sample must be to reach a given level of confidence. This was important for this study due to the large number of categories in certain variables (especially the diagnostic variables).

Some survey samples may be divided into subsamples, which are then analyzed separately. This was the case in the present study where each year was examined individually. In this situation the size of each subsample must be determined separately and the total sample size must be relatively large to ensure adequate numbers within these subsamples. Most surveys do not need a precise sample size, so it takes study and judgement of various conditions (Alreck and Settle, 1995). A third was chosen for this study due to the need for a large enough number of subjects within each strata and the fact that there were many subcategories to analyse. Using a third, rather than the 10 percent often used, also allowed for the fact that there was data missing which reduced the sample size. Subjects excluded due to missing data were not replaced. The sample sizes are presented in Table 2.1. Figures have been rounded off to the nearest whole number.

The sampling frame was drawn up by using the folder numbers of all the new clients who had attended the Speech Therapy and Audiology OPD at the tertiary hospital being studied from the beginning of 1999 to the end of 2003.

- Folder numbers were used as this allowed for client confidentiality to be kept, allowed for easier retrieval of hospital records and for greater accuracy as there may have been hospital clients with the same names.
- The sampling frame was drawn up by going through the client register for 1999, where each new client's details had been entered into a book, and the client record cards for 2000 to 2003. The register had the clients entered in numerical order of when they first attended in the year, while the record cards were stored alphabetically. These were stored within the Speech Therapy and Audiology OPD and included records of all the clients who attended for the first time in these years.
- The folder numbers of all the clients in the population were captured in Microsoft Excel in the relevant year.
- For the registers, the folder number was typed alongside the year the client was seen and the number they were entered at in the book. The clients on the record cards had their folder numbers typed together with the year they were seen and the first letter of their surname. This was to facilitate the process of finding the client information for the subjects who were selected.

- A computer programme was used to select a third of the numbers randomly for each year. The folder numbers that were selected formed the sample and these records became the 'subjects' for the research.
- Any folder number which appeared more than once in the same year in the sample had one entry removed from the sample. If a client was in the sample in more than one year, then the earliest chronological entry was used and the others were removed. The numbers for the final sample after duplicates were removed are shown in Table 2.1.
- Henceforth the term 'subjects' will be used for those clients whose folders were selected in the sample.

2.5. Materials

2.5.1. Instruments

The data collection form was devised by the researcher in order to record the data (See Appendix A). First the information which was needed for the study was listed. Then examples of hospital records were examined and the form was constructed by examining how data was organised in these records and ordering the data collection form in a similar manner. Thus information presented first in the records would be first on the data collection form. The initial draft of the form was then used for the initial stages of data collection, and then modified in such a way as to make data retrieval easier (see 2.6.3.).

The researcher designed the data collection form to document the relevant data as it is recorded in the hospital files to make for easier collection of the data and to reduce the possibility of errors, as terminology between the form and the folder were similar. All the data must be recorded correctly as it is impossible to detect and correct coding errors (Abramson, 1990). The data collection form, designed as the information is recorded in the files, also made data collection simpler. For certain variables, where there were only a limited number of set choices and no other possible options (e.g. male/female), options to choose from were given. Other data (e.g. address) had to be written in. This was done as certain variables had a wide range of possible information or different terminology usage, which would later be grouped together, but may have

resulted in confusion at the time. A new data collection form was used for each individual studied as recommended by Abramson (1990).

2.5.2. Apparatus

A personal computer was used to capture the data. The following programmes were utilised: Microsoft Excel, SPSS 12.0 for Windows.

2.6. Data collection

2.6.1. Procedures for accessing information from sample group

Biographical, demographic, diagnostic and attendance data were accessed using the procedures described below. Before this could be done permission to utilise this information was sought from the Head of the Speech Therapy and Audiology Department, the Medical Superintendent of the tertiary institution being studied, and the Ethics committee of the University of Cape Town.

Negotiating Access

Much real world research takes place in settings where formal agreement from someone to gain access is required (Robson, 1993). Permission was obtained from the head of the Speech Therapy and Audiology department and the Medical Superintendent at the tertiary hospital being studied. They were provided with an outline of the research. Once this access had been negotiated, arrangements with the medical records department were made to access the data.

2.6.2. Data Gathering

- The subjects' names were retrieved from the client registers and record cards. This information, as well as the year in which the subject was first seen, was then entered into the computer and sorted by folder number to make for easy access to reference subjects in a filing system. These sheets were then printed out.
- The information on these sheets was then written on to the request forms used by medical records.
- The data collection form was then utilized to capture the data from the records.
- Each subject's gender, home language, date of birth, family income and number of dependants, occupation and marital status were recorded from the record sheet at the front of the folder/on the microfilm onto the data collection form. Their residential address (including area and postal code) was also recorded.
- If information regarding home language was available in the Speech Therapy and Audiology notes, this was checked against that on the record sheet. If they were not the same, the information in the Speech Therapy and Audiology notes was taken as correct, as this information would have been recorded by the therapist who was seeing the client and was thus likely to be more accurate.
- The Speech Therapy and Audiology notes were then consulted with regard to collecting data on the medical diagnosis and type of speech or hearing disorder. The diagnosis as given by the professional who attended to the client was considered as correct, although different professionals may use slightly different terminology. Similar terms were grouped together for the analysis (e.g. stroke and CVA).
- Where Speech Therapy and Audiology folders were missing, or information was missing in them, other relevant medical notes in the hospital records were consulted.
- Referral sources were recorded where this information was available.
- Information which was missing in the records was recorded as such.
- The number of case notes entered was counted to reflect attendance data and each date of an attendance was written down.
- For non-attendance, dates stating cancelled, did not attend (DNA) or similar comments were counted. Where these were not available, the dates for the following appointment as recorded

in the notes were matched against the date the subject next came. Where these did not match one non-attendance was recorded.

- The dates of all appointments were recorded so that a time frame over which the subject attended therapy could be determined by noting the first and last therapy appointment dates.
- To allow for confidentiality, once data had been coded, subjects' names and folder numbers were removed.

2.6.3. Data Capturing and Management

- Once all the above information had been retrieved, the subject's folder number was found on the list of subjects and initialled in order to prevent duplication of data collection.
- The data was entered into the computer in a Microsoft Excel spreadsheet as raw data and then entries were coded by the researcher (see 2.7.2.). Validity and reliability issues are addressed later (see 2.8.).
- Where there was data missing on the form (where it was not indicated as missing in the records), the records were consulted again by the researcher to retrieve this information.
- Once the data had been entered into the computer and checked, subject names and folder numbers were removed to retain anonymity of the subjects.
- Attendance data was then converted to number of appointments attended, time frame over which these appointments were attended and the percentage of appointments attended.

Difficulties encountered during the data collection phase included missing records, incomplete records, and information recorded in an inconsistent manner within and between records. Many of the difficulties encountered in this study were similar to those found by Farmer (1990) and Schneider (1992).

Pilot Phase

A true pilot phase for the study could not be conducted as initially planned, where one year's data would be captured and analysed to determine any problems. The reason that it could not be done, was due to difficulties accessing records and that all the records for one year could not be retrieved before other years. Some subjects from each year had records stored in the main section

of Medical Records, some in the Microfilm department and some were filed to be microfilmed. Thus it was difficult to access files across these sections at the same time. However, once most of the data had been collected, the data for one year was coded to develop the coding system.

- At this point the category for monthly income (and number of dependants) was discarded due to discrepancies in the way this information had been captured in the hospital records.
- Lists of most of the responses on the forms were made and where different terminologies (e.g. vocal cord pathology and phonatory disorder) may have been used, these were then categorised into broad categories.
- It was also determined from the health district map into which health district each suburb fell (see Figure 2.1).
- Lists of all the categories were then drawn up with the appropriate codes (see 2.7.2.).
- Once this first year had been coded and it was determined that each item had a code, the rest of the data from other years was then also coded.

Monthly income was excluded as a category due to the fact that it had been captured in different ways for different years and was thus considered to be unreliable information. The data collection form was also slightly reorganized to allow for easier retrieval of data. No other changes were made.

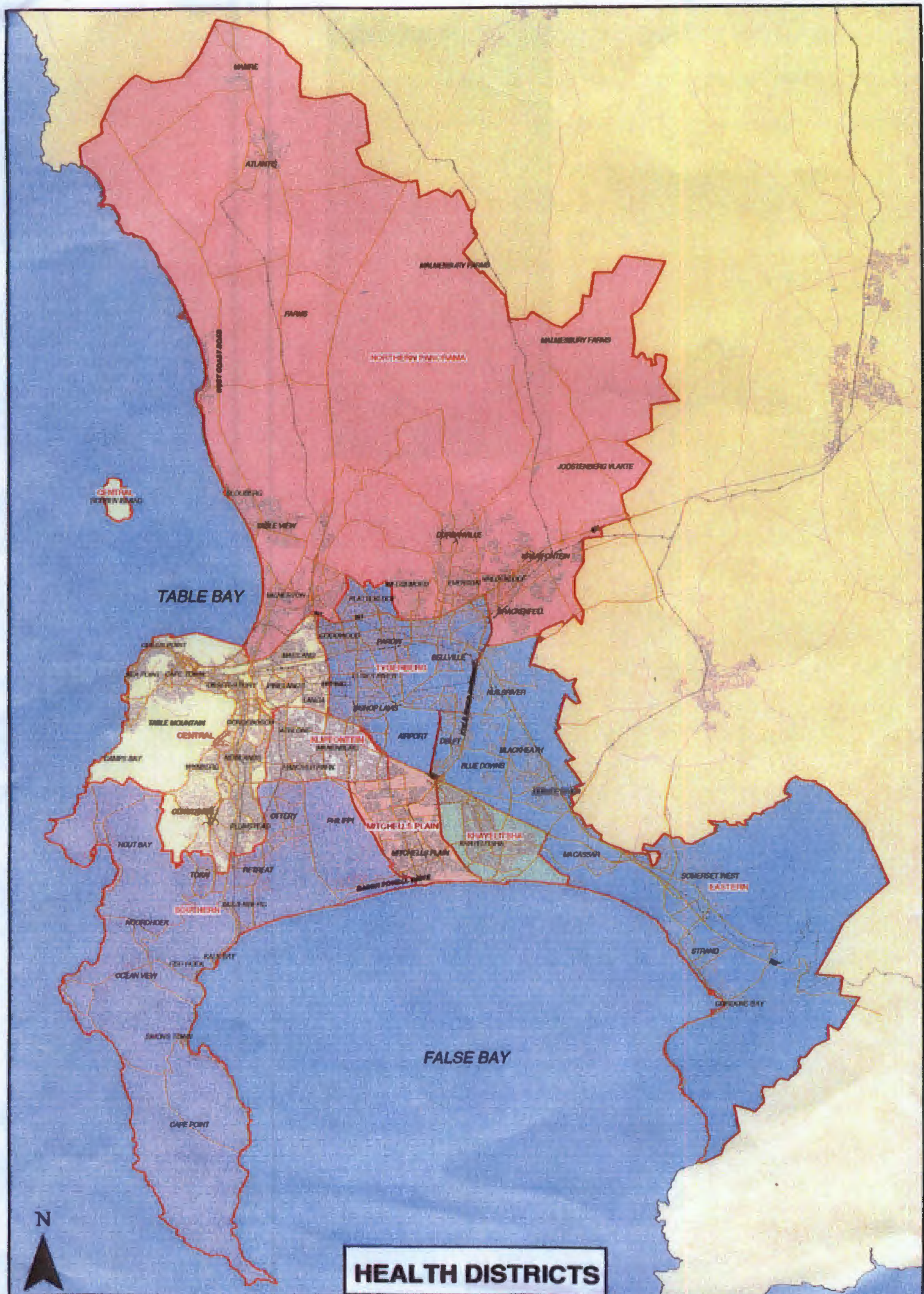
2.7. Data analysis

2.7.1. Variables

The data was coded and captured in nominal, ordinal and numerical categories (Joubert, 1997) according to the type of data, to allow for appropriate data handling. The diagnostic variables and demographic variables, excluding age, were nominal as numbers were merely used to represent categories. Age and the attendance data (apart from percentage of appointments attended) were classified as ordinal as the individual score was not used but were classified within a range, and data had a logical order. Percentage of appointments attended was the only variable which was metric.

Figure 2.1

Map of Health Districts in Cape Town



2.7.2. Coding of data

Every demographic, diagnostic and attendance variable that was collected had a set of codes (Katzenellenbogen and Joubert, 1997). The coding system was developed when the first year of data was coded, so that categories could be drawn up. Many researchers only allocate codes to the more qualitative questions once the types of responses that emerge can be seen (Katzenellenbogen and Joubert, 1997). The data was all coded into numbers for easier analysis (see Appendix B). An example of a coded form is provided in Appendix C.

Clients with a hearing loss possibly as a result of a head injury were recorded as having a medical diagnosis of auditory pathology, together with other hearing loss/tinnitus subjects, rather than in the category of head injury, as it was often unclear if the head injury was the cause of the hearing loss or not.

For referral sources, the category of ENT/Audiology department at the study hospital needs to be explained. The study institution has a separate Audiology department connected with the ENT department in addition to the combined Speech Therapy and Audiology Department. The nature of the work in the Audiology department connected to ENT differs from that done in the Speech Therapy and Audiology Department. Due to the fact that the other Audiology department works very closely with the ENT department and it was often impossible to differentiate referrals between the two, they were categorised together.

Age group were generally categorised into 10 year groups, with the exception of those under 30. 0-6 year-olds were made a category, as these children have not yet started school and this is the main age group served by the paediatric hospital located nearby. 7-12 year-olds from the bulk of the primary school population and 13-18 year olds the high school population, although there is some overlap between ages in primary and high schools. 19 year-olds were grouped with the 20-29 age-group, due to the fact that they were likely to be finished school.

Geographical Locations were coded according to the health districts as shown in Figure 2.1.

For the attendance data and the relationships between Speech and Audiology diagnosis with other variables, the category of 'voice and dysphagia' was combined with voice disorders, due to the small number of subjects in the category of 'voice and dysphagia'.

Number of appointments that were attended, were coded individually from 1-9 and into groups of 10 for more appointments than this. This was done as the number of subjects for each appointment over 9 would have been too small, and thus meaningless, and there would also have been too many categories.

2.7.3. Coding of missing data

Where a data collection form had missing data through the negligence of the researcher the records were re-checked by the researcher and the missing information retrieved. However, where information was unavailable it was categorised as such. If the subject had missing data for 2 or 3 of the 3 diagnostic variables their data was excluded from analysis related to these variables (medical diagnosis, speech-language and audiology diagnosis and referral source) and the attendance data, but were still included in the analysis of demographic variables. Where there was no clear attendance data for two or more attendance variables (number of appointments attended, number missed or cancelled, percentage of appointments attended or time frame over which therapy commenced) these subjects were excluded from the analysis of attendance information. However, if only one of these was missing the data was still included in the overall attendance analysis. To exclude data collection forms that have data missing is not usually practical and would often eliminate a large part of the sample (Alreck and Settle, 1995).

Information indicating how much data was missing was also documented as recommended by Katzenellenbogen and Joubert (1997). This indicated how much information could not be obtained due to illegible entries, lost records or information not being available in the records. An accurate count of the number of excluded data was kept. The exclusions are discussed in this report (Katzenellenbogen and Joubert, 1997) and numbers excluded can be seen in Table 2.2.

Table 2.2

Number of subjects for demographic, diagnostic and attendance data description for each year and the 5 year period

Year	No. of Subjects for Demographic Description		No. of Subjects for Diagnostic Description		No. of Subjects for Description of Attendance Data	
	Included	Excluded	Included	Excluded	Included	Excluded
1999	194	3	182	12	147	35
2000	174	5	164	10	138	26
2001	182	6	171	11	144	27
2002	185	4	171	14	144	27
2003	175	1	171	4	146	25
5 Years	910	19	859	51	719	140

2.7.4. Procedures for data analysis

Due to the descriptive nature of this study, analysis of variables was conducted via descriptive statistics (Hite, 2001; Jaeger, 1990), as used in other similar studies (e.g. Enderby and Petheram, 2000; Petheram and Enderby, 2001). Inferential statistics were not used as for a descriptive study this form of data analysis is not appropriate (Hite, 2001).

Frequency and percentage distributions were used to describe the demographic, diagnostic and attendance data. Frequency data was converted into percentage data for each year and for the total sample. This included frequency and percentage distributions for the diagnostic variables [Speech and Audiology diagnosis (2.2.2.1.1.a), medical diagnosis (2.2.2.1.1.b) and referral source (2.2.2.1.1.c)], demographic variables [age (2.2.2.1.2.d), gender (2.2.2.1.2.e), home language (2.2.2.1.2.f), occupation (2.2.2.1.2.g), marital status (2.2.2.1.1.h) and geographical location (2.2.2.1.2.j)], as well as the attendance variables [number of appointments attended (2.2.2.1.2.l), percentage of appointments attended (2.2.2.1.2.m) and period of time over which attended the department (2.2.2.1.2.n)]. The percentage of appointments attended was looked at in relation to the number of appointments booked.

Tabular and graphic displays are extensively used in descriptive research (Hite, 2001). Frequency and percentage distributions of response are the most common form of data description for a limited number of values or categories (Alreck and Settle, 1995). Frequency tables provide a very complete picture of the distribution of data for the variable. Their use is limited mainly by the number of scale points or categories that can be shown. When there are a dozen or fewer categories or scale points, frequency tables are ordinarily practical and meaningful. Thus these means of data representation were suitable for variables in this study, which were mostly nominal and ordinal.

Percentage distributions are often more easily interpreted and of more interest than are frequency distributions. This is because percentages can be compared from one item or survey to the next, even though they may be based on different total frequencies (Alreck and Settle, 1995). More importantly the sample percentages can be used directly as an estimate of the percentages of the total population that might indicate each alternative response. Thus the percentage distribution is often the most important column on the frequency table for those interpreting the survey results. Percentages allowed the researcher to more easily compare trends across years, where each year had a different sample size.

Contingency tables (cross tabulation) were used to show relationships between variables as described in 2.2.2.2. These tables allow one to show the numbers or percentages of sampled individuals who fall into each category of one variable and each category of the other (Jaeger, 1990). Thus one can look at the data for two variables at the same time and note trends across these variables. These are shown only as percentages in the results section, as percentages allowed for easier comparison of data than numbers.

The statistical package SPSS 12.0 for Windows was used to draw up the frequency and percentage distributions, as well as the cross-tabulations. The coded data was transferred from Excel into SPSS 12.0 for Windows and then variables were selected for frequency and percentage distributions to be drawn up, as well as for the contingency tables.

The data was then graphically represented, using bar charts and in one instance a pie chart (Hite, 2001). The frequency and percentage distribution tables and the graphs were examined, with respect to how they related to the aims of the study (Hite, 2001). These results were then

interpreted, by looking at each variable individually and in relation to each other and noting patterns in the data. The discussion section typically distinguishes between analyses that are significant in a technical sense and those that are relevant or central to the study itself (Hite, 2001). At this point it was important to match the purpose of the study with the results. Major trends were detected and confirmation and discrepancies in what had been expected were found. These findings were then discussed in relation to other research and discussed in the light of the social, political and institutional context, as context is crucial (Terre Blanche and Kelly, 1999) to interpreting and understanding data.

When drawing conclusions it was important to consider whether the conclusions were warranted (Hite, 2001). It was therefore important to evaluate whether each conclusion was justified by the data analysis. The issue of generalizability also had to be considered. Limitations and implications of the study were then drawn based on the results and discussion.

2.8. Reliability and Validity

2.8.1. Reliability

Reliability is the degree of similarity of the information obtained when the measurement is repeated on the same subject or group (Katzenellenbogen and Joubert, 1997). Reliability of data collection was ensured by setting exact ways of measuring and checking of work (Katzenellenbogen and Joubert, 1997). In this study a set data collection form was used to ensure reliability of the instrument. Data was also double checked by the researcher as it was entered. Cross checks of information from the hospital record sheet and the Speech Therapy and Audiology folder also allowed for greater reliability of the data collected.

Instrument, observer and subject variations can be evaluated by repeating measures of a sub-sample of the study sample (Katzenellenbogen and Joubert, 1997). In this study a random sample of 10 percent of the subjects from each year was selected for re-collection of data (n=93). A Speech Therapist colleague then retrieved information from the records. This was then coded and comparisons of the codes were then made between the data collected by her and the same

data collected by the researcher to determine the accuracy of information collected. For each variable, the number of codes which did not match were added up and then worked out as a percentage of the total for that variable (Hite, 2001).

There was 94.71 % agreement across all the variables, indicating good inter-observer reliability. It was difficult to judge what would be accepted as a high degree of reliability for this study as these issues have not been addressed in detail in similar literature. However, most tests of good reliability have a correlational coefficient of between +0,90 and +0.96 (Behr, 1988), which relates to 90 to 96 %. Thus the data collection process had a high degree of reliability with regard to the observer and the instrument. Table 2.3 shows the percentage agreement for each variable. The attendance data, where number of appointments attended or not attended was recorded, had the lowest degree of reliability, due to difficulties interpreting the way the information was recorded in the hospital records. Language also showed some discrepancies, as did referral sources and occupational category. Reliability of subject information was not considered a difficulty due to the fact that data recorded in the files was unlikely to change within the study period.

Table 2.3.

Percentage of agreement in data collected between the researcher and a Speech Therapy colleague collecting the same data for each category and across all the data

Category	Percentage Agreement
Age	98.92 %
Gender	100 %
Language	92.47 %
Geographical Area	96.77 %
Marital Status	98.92 %
Occupational Category	93.55 %
Medical DiagnosisDx	96.77 %
Speech-Language and Audiology Diagnosis	95.70 %
Referral Source	92.47 %
Number of Appointments Attended	87.10 %
Number of Appointments DNA	88.17 %
Time Period	95.70 %
Total	94.71 %

2.8.2. Validity

Validity refers to the extent to which a measure actually measures what it is meant to measure (Katzenellenbogen and Joubert, 1997). However, this concept of validity needs to be extended to more than just the validity of the instrument used, to a more holistic view of the use, interpretation and potential social and cultural impact of the use of data (Hite, 2001).

Studies investigating similar variables as in this research were consulted, to determine the methods used for collecting demographic, diagnostic and attendance data (e.g. Enderby and Petheram, 2000; Petheram and Enderby, 2001; Roulstone et al., 2004). This review of methodologies aided the researcher to select a method for data collection that would be similar to other studies and thus increase the validity of the data collection process. Data collection forms from other studies were examined (e.g. Farmer, 1990; Kyriacos, 1993; Rhoda, 2001), before constructing the data collection form for this study. The researcher then designed the form to document the relevant data as it was recorded in the hospital files to make for easier collection of the data and to reduce the possibility of errors. Using the information as such also allowed for a good degree of face and content validity of the data collection tool, as it was easy to see what was being examined and that the form encompassed the relevant information provided in the records. One difficulty with the data collection method selected was that hospital records are generally produced for clinical, administrative or monetary ends rather than research purposes and this may lead to questions of validity arising (Abramson, 1990). Another area of concern for validity of the method was related to capturing information on diagnosis, where different clinicians may have used different terminology. However, this has been acknowledged under limitations of the research and the diagnostic categories were broad to allow for variations of terminology.

A large sample was chosen to enhance the validity of the study as confidence intervals become narrower as sample size increases (Abdool Karim, 1997). Data analysis was conducted using a statistical computer programme to ensure the data was analysed in a consistent manner, thus ensuring valid and reliable results. Interpretation of the data was discussed with colleagues to determine different views and possible explanations with regard to the findings to determine whether suggested interpretations seemed valid.

2.9. Ethical Considerations

2.9.1. The principle of respect for persons

The relevant people were consulted with regard to gaining access to the hospital files as outlined in section 2.6.1. It was not, however, possible to gain consent from the subjects, due to potential difficulties locating subjects and the number of records being reviewed. However, confidentiality was strictly kept, by removing any identifying information when the information had been checked and coded. Access may be ethical on such grounds as minimal risk of harm to individuals, potential public benefit, and investigators' protection of the confidentiality of the individuals whose data they study (Guidance document: Council for International Organisations of Medical Sciences, 1991).

2.9.2. The principle of beneficence

The study will not benefit individual subjects directly but has the potential to benefit the community by making recommendations with regard to restructuring of services to meet the needs of the client population. The results of this study will be made available to all relevant parties, including the head of the Speech Therapy and Audiology Department and the Medical Superintendent at the tertiary hospital under study, and the Western Cape Department of Health and Social Services. Recommendations will be made from the findings to guide service provision.

2.9.3. The principle of justice

The community will stand to benefit from the research if changes, taking into account the findings of this study, are made within the healthcare setting with regard to equity in service provision and aligning the services to the needs of the population.

2.9.4. Process of getting ethical approval for this study

The research proposal was approved by:

- The University of Cape Town ethics committee

Permission to use the data was obtained from:

- The Head of the Speech Therapy and Audiology Department at the tertiary hospital being studied
- The Medical Superintendent at the tertiary hospital being studied

2.10. Reporting and implementation

The results of this study will be made available to all relevant parties, including the Head of the Speech Therapy and Audiology Department and the Medical Superintendent at the tertiary hospital under study, and the Western Cape Department of Health and Social Services. Recommendations have been made to guide implementation of interventions suggested by the findings.

2.11. Summary of Chapter 2

This chapter has outlined the aims of the study and methodological issues. The study population and sampling procedures were explained, as were the materials and methods used for data collection. Data analysis was discussed. Following this issues of reliability and validity, as well as ethical issues were considered. Finally the issue of reporting and implementation were mentioned.

Chapter 3

Results

3.1. Introduction

This chapter presents the results of the study in three main sections as they relate to the aims. The first section (section 3.2.) presents the diagnostic data. The speech-language and audiology diagnostic categories are presented first within this section as many of the other sections are examined as a whole and then in relation to this diagnostic variable. Following this the medical diagnosis and referral source are presented. The second section presents demographic data (section 3.3.), which is followed by a description of the attendance data in the final section (section 3.4.).

Within each of the first two sections, the results for each variable are presented initially for the complete sample, in other words the results for the full five years, followed by comparisons of the data for each year, where trends were noticeable. Where there were no major changes across the years, the results can be found in Appendix D. Following this, the results of the variable being described will be related to the speech-language and audiology diagnosis, for the complete five year sample. The highlighted sections in the tables indicate the most noticeable or important trends. The final section that describes the attendance data, will only present results for the total sample. Most of the results within this section are presented as percentages only, but numbers of subjects and further results can be found in Appendix D.

Thus sections 3.2. 3.3. and 3.4. relate to the first specific aim of the study (2.2.2.1), and to specific aims 2.2.2.1.1., 2.2.2.1.2. and 2.2.2.1.3. respectively. The second aim of the study (2.2.2.2.), to describe associations between variables, is incorporated within these sections as appropriate. The interpretation and discussion of the results in presented in Chapter 4.

3.2. Diagnostic Data

Speech-language and audiology diagnosis results are presented first, followed by medical diagnosis and referral source.

3.2.1. Speech-Language and Audiology Diagnosis

The percentage of subjects within each speech-language and audiology diagnostic category are presented in Figure 3.1.

Subjects with a diagnosis of hearing loss/tinnitus made up the greatest percentage of subjects. This was followed by voice cases and then neurological communication difficulties. When considering the disorders which were made up mostly by children (fluency, phonology/articulation/oral motor, language, language and learning disability and multiple difficulties), fluency and then children with multiple difficulties formed the largest groups.

Diagnostic categories appeared to remain fairly consistent over the five year period, with minor variations across the years. There was, however, a gradual increase in the percentage of dysphagia cases from 1999 to 2002, although this dropped off in 2003. There was a decrease in the percentage of articulation/phonology/oral motor cases from 1999, and from 2001 there was an increase in the number of children with multiple difficulties. There was a decrease from 1999 to 2003 in the percentage of subjects in the category 'none', which was made up of clients who had no speech-language or audiology diagnosis.

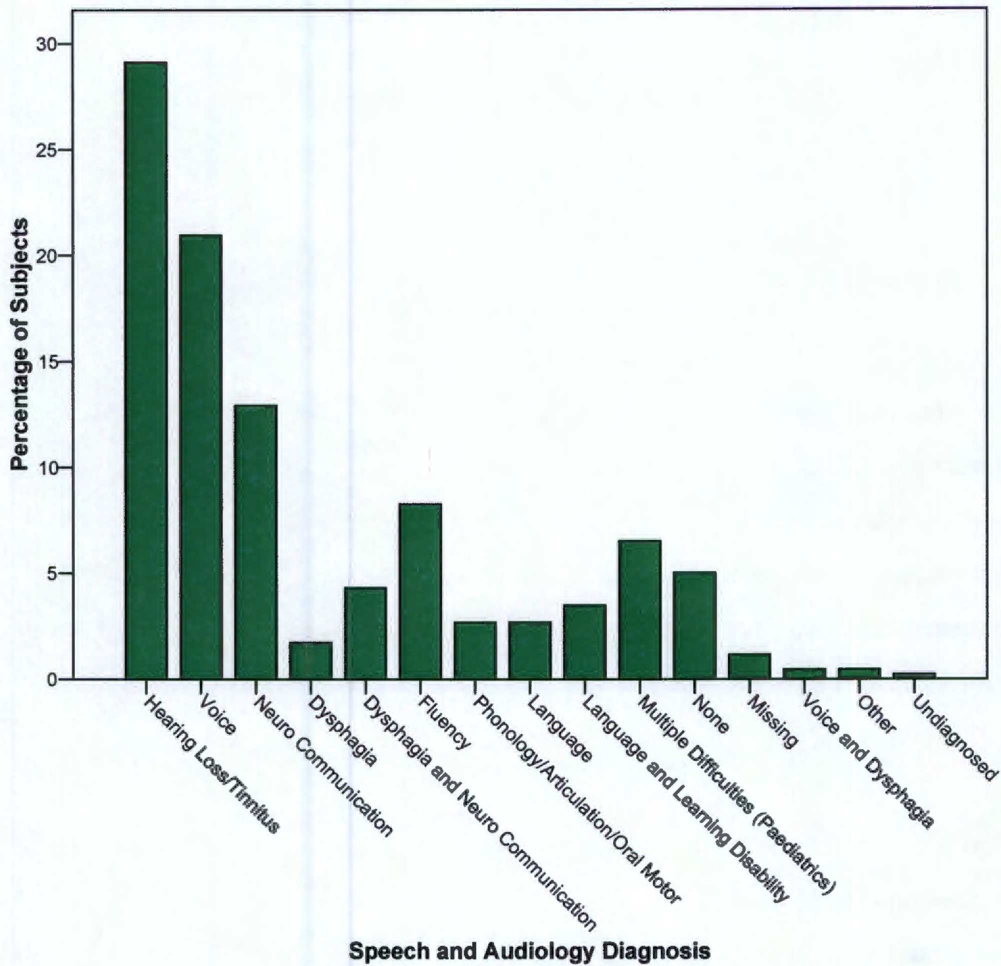


Figure 3.1

Percentage of subjects per speech-language and audiology diagnostic category who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

3.2.2. Medical Diagnosis

Figure 3.2. illustrates the percentage of subjects within each category of medical diagnosis.

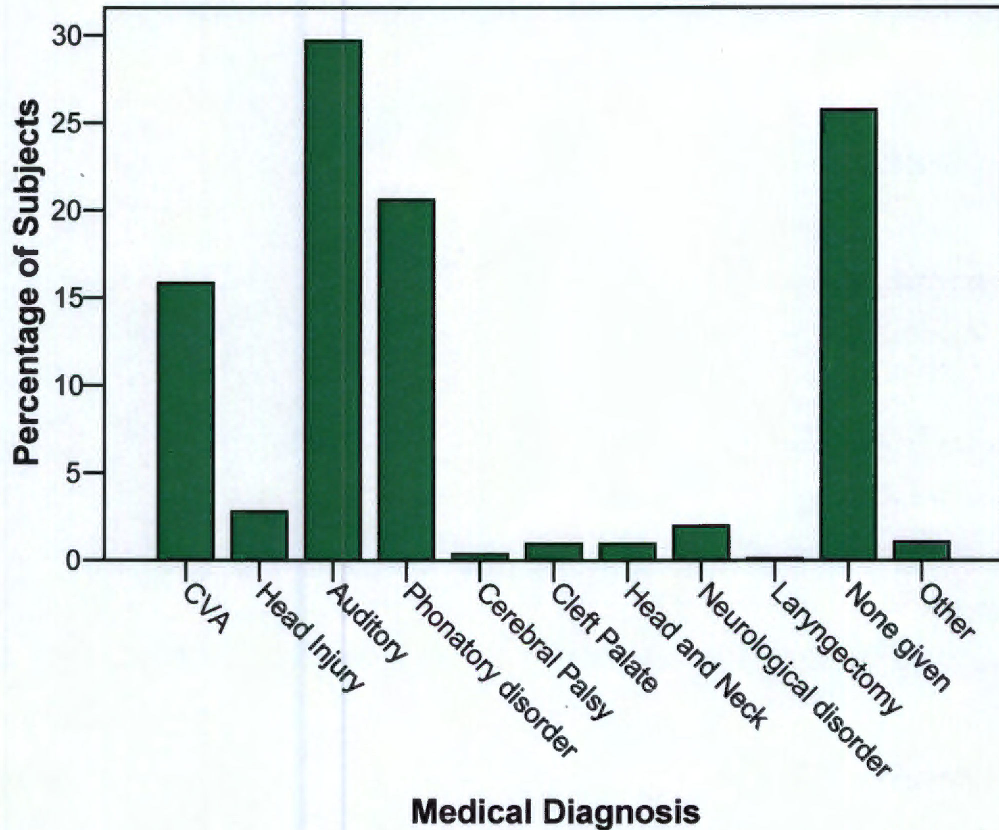


Figure 3.2

Percentage of subjects per medical diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

The majority of subjects had an auditory pathology, phonatory disorder, CVA or no medical diagnosis. Types and percentages of medical diagnoses remained relatively similar across the years.

Table.3.1

Percentage of subjects per medical diagnosis and speech-language and audiology diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

		Medical Diagnosis											
		CVA	Head Injury	Auditory	Phonatory disorder	Cerebral Palsy	Cleft Palate	Head and Neck	Neurological disorder	Laryngectomy	None given	Other	Total
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagnosis		.4%	98.8%				.4%	.4%				100.0%
	% within Medical Diagnosis		4.2%	96.9%				12.5%	5.9%				29.1%
Voice (n=180)	% within Speech and Audiology Diagnosis	1.1%		.5%	93.4%			1.1%	1.1%	.5%	2.2%		100.0%
	% within Medical Diagnosis	1.5%		.4%	96.0%			25.0%	11.8%	100.0%	1.8%		21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagnosis	76.6%	15.3%						6.3%		1.8%		100.0%
	% within Medical Diagnosis	62.5%	70.8%						41.2%		.9%		12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagnosis	60.0%						6.7%	13.3%		13.3%	6.7%	100.0%
	% within Medical Diagnosis	6.6%						12.5%	11.8%		.9%	11.1%	1.7%
Dysphagia and Neuro Communication (n=37)	% within Speech and Audiology Diagnosis	81.1%	2.7%					8.1%	8.1%				100.0%
	% within Medical Diagnosis	22.1%	4.2%					37.5%	17.6%				4.3%
Fluency (n=71)	% within Speech and Audiology Diagnosis										100.0%		100.0%
	% within Medical Diagnosis										32.1%		8.3%
Phonology/Articulation/ Oral Motor (n=23)	% within Speech and Audiology Diagnosis					4.3%	8.7%				82.6%	4.3%	100.0%
	% within Medical Diagnosis					33.3%	25.0%				8.6%	11.1%	2.7%
Language (n=23)	% within Speech and Audiology Diagnosis						4.3%				82.6%	13.0%	100.0%
	% within Medical Diagnosis						12.5%				8.6%	33.3%	2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagnosis		3.3%				10.0%				86.7%		100.0%
	% within Medical Diagnosis		4.2%				37.5%				11.8%		3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagnosis	1.8%		10.7%		3.6%	3.6%				75.0%	5.4%	100.0%
	% within Medical Diagnosis	.7%		2.4%		66.7%	25.0%				19.0%	33.3%	6.5%
None (n=43)	% within Speech and Audiology Diagnosis	7.0%	7.0%	2.3%	9.3%						74.4%		100.0%
	% within Medical Diagnosis	2.2%	12.5%	.4%	2.3%						14.5%		5.0%
Missing (n=10)	% within Speech and Audiology Diagnosis	40.0%			10.0%			10.0%	20.0%		20.0%		100.0%
	% within Medical Diagnosis	2.9%			.6%			12.5%	11.8%		.9%		1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagnosis				100.0%								100.0%
	% within Medical Diagnosis				1.1%								.2%
Other (n=4)	% within Speech and Audiology Diagnosis	50.0%									50.0%		100.0%
	% within Medical Diagnosis	1.5%									.9%		.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagnosis		50.0%									50.0%	100.0%
	% within Medical Diagnosis		4.2%									11.1%	.2%
Total (n=859)	% within Speech and Audiology Diagnosis	15.8%	2.8%	29.7%	20.6%	.3%	.9%	.9%	2.0%	.1%	25.7%	1.0%	100.0%
	% within Medical Diagnosis	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The percentages of subjects per medical diagnosis related to each speech-language and audiology diagnosis can be seen in Table 3.1 and show trends as would be expected.

- 62.5 % of CVA patients presented for a neurological communication disorder, 22.1 % for dysphagia and a neurological communication disorder and 6.6 % for dysphagia alone.
- 76.6 % of neurological communication disorders were CVA subjects, with a further 15.3 % from head injury and 6.3 % from another neurological condition.
- 60 % of dysphagia subjects had had a CVA and 81.1 % of those with dysphagia and a neurological communication disorder were CVA patients.

3.2.3. Referral Source

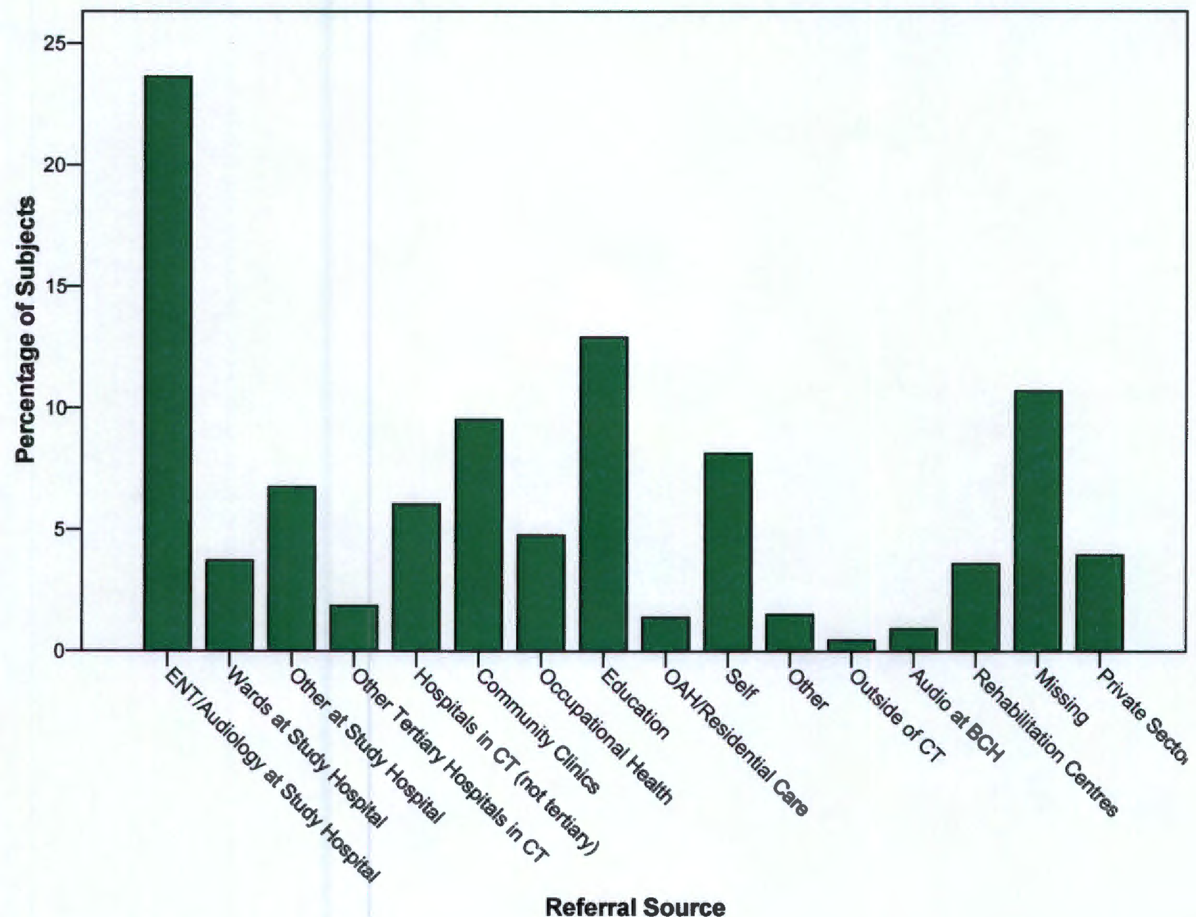


Figure 3.3

Percentage of subjects per referral source who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

Information about referral sources is shown in Figure 3.3.

- The largest percentage of subjects was referred from the ENT/Audiology department at the study institution.
- The education sector, followed by community clinics, were the next largest referral sources.
- 8.1 % of subjects were self-referred.
- Referral source was missing for just over 10% of subjects.

With regard to changes over the 5 year period, from 2000 there was an increase in referrals from community clinics and from wards at the study hospital. In 2003 there was in increase in referrals from other tertiary hospitals in Cape Town. Referrals from the education sector dropped in 2000 and 2001.

Table 3.2 presents the relationships between speech-language or audiology diagnosis and referral sources.

- 75.8 % of subjects with voice disorders were referred from the ENT/Audiology department at the study hospital and 68 % of the referrals from the ENT/Audiology department were voice cases.
- 50 % of referrals from community clinics, 80.5 % of referrals from occupational health centres and 83.3 % of referrals from old age homes or residential care centres attended for a hearing loss.
- The majority of the referrals from wards were for dysphagia, neurological communication disorders or a combination of these.
- 50 % of paediatric subjects with multiple difficulties were referred from the education sector.
- Fluency subjects had the most self referrals.

Table 3.2

Percentage of subjects per referral source and speech-language audiology diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

		Referral Source																
		ENT/ Audiology at Study Hospital	Wards at Study Hospital	Other at Study Hospital	Other Tertiary Hospitals in CT	Hospitals in CT (not tertiary)	Community Clinics	Occupational Health	Education	OAH/ Residential Care	Self	Other	Outside of CT	Audio at BCH	Rehabilitation Centres	Missing	Private Sector	Total
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagn	19.6%		2.8%	1.2%	1.6%	16.4%	13.2%	8.0%	4.0%	8.0%	2.8%	1.6%	3.2%	1.6%	12.8%	3.2%	100.0%
	% within Referral Source	24.1%		12.1%	18.8%	7.7%	50.0%	80.5%	18.0%	63.3%	28.6%	53.8%	100.0%	100.0%	12.9%	34.8%	23.5%	29.1%
Voice (n=180)	% within Speech and Audiology Diagn	75.8%		7.1%		4.9%	1.1%					1.1%				7.1%	2.7%	100.0%
	% within Referral Source	68.0%		22.4%		17.3%	2.4%					15.4%				14.1%	14.7%	21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagn	.9%	17.1%	20.7%		17.1%	10.8%					2.7%			17.1%	10.8%	2.7%	100.0%
	% within Referral Source	.5%	59.4%	39.7%		36.5%	14.6%					23.1%			61.3%	13.0%	8.8%	12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagn		20.0%	33.3%		13.3%									13.3%	13.3%	6.7%	100.0%
	% within Referral Source		8.4%	8.6%		3.8%									6.5%	2.2%	2.9%	1.7%
Dysphagia and Neuro Communication (n=37	% within Speech and Audiology Diagn	5.4%	24.3%	13.5%		29.7%	8.1%								10.8%	5.4%	2.7%	100.0%
	% within Referral Source	1.0%	28.1%	8.6%		21.2%	3.7%								12.9%	2.2%	2.9%	4.3%
Fluency (n=71)	% within Speech and Audiology Diagn				5.6%	1.4%	12.7%	4.2%	26.8%		25.4%				1.4%	15.5%	7.0%	100.0%
	% within Referral Source				25.0%	1.9%	11.0%	7.3%	17.1%		25.7%				3.2%	12.0%	14.7%	8.3%
Phonology/Articulation/ Oral Motor (n=23)	% within Speech and Audiology Diagn	4.3%			8.7%		13.0%		34.8%		17.4%					8.7%	13.0%	100.0%
	% within Referral Source	.5%			12.5%		3.7%		7.2%		5.7%					2.2%	8.8%	2.7%
Language (n=23)	% within Speech and Audiology Diagn				8.7%	4.3%	13.0%		34.8%		26.1%					8.7%	4.3%	100.0%
	% within Referral Source				12.5%	1.9%	3.7%		7.2%		8.6%					2.2%	2.9%	2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagn		3.3%	3.3%	6.7%				53.3%		23.3%				3.3%	6.7%		100.0%
	% within Referral Source		3.1%	1.7%	12.5%				14.4%		10.0%				3.2%	2.2%		3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagn				3.6%	3.6%	12.5%		50.0%	1.8%	17.9%					5.4%	5.4%	100.0%
	% within Referral Source				12.5%	3.8%	8.5%		25.2%	8.3%	14.3%					3.3%	8.8%	6.5%
None (n=43)	% within Speech and Audiology Diagn	16.3%		7.0%	2.3%	2.3%		11.6%	23.3%		11.6%	2.3%				16.3%	7.0%	100.0%
	% within Referral Source	3.4%		5.2%	6.3%	1.9%		12.2%	9.0%		7.1%	7.7%				7.6%	8.8%	5.0%
Missing (n=10)	% within Speech and Audiology Diagn	30.0%				20.0%	10.0%									30.0%	10.0%	100.0%
	% within Referral Source	1.5%				3.8%	1.2%									3.3%	2.9%	1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagn	100.0%																100.0%
	% within Referral Source	1.0%																.2%
Other (n=4)	% within Speech and Audiology Diagn						25.0%		50.0%							25.0%		100.0%
	% within Referral Source						1.2%		1.8%							1.1%		.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagn			50.0%						50.0%								100.0%
	% within Referral Source			1.7%						8.3%								.2%
Total (n=859)	% within Speech and Audiology Diagn	23.6%	3.7%	6.8%	1.9%	6.1%	9.5%	4.8%	12.9%	1.4%	8.1%	1.5%	.5%	.9%	3.6%	10.7%	4.0%	100.0%
	% within Referral Source	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

3.3. Demographic Data

Demographic data is divided into the variables of age group, gender, language, occupation, marital status and geographical location.

3.3.1. Age Groups

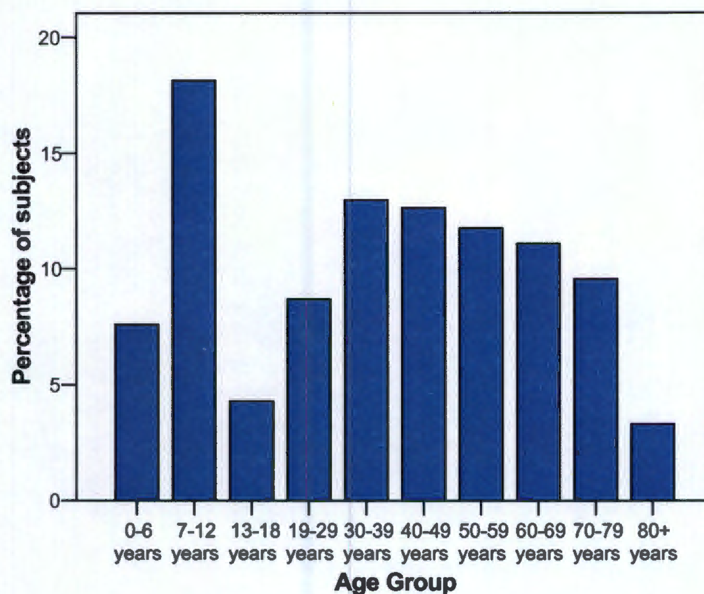


Figure 3.4

Percentage of subjects per age group who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=910)

Figure 3.4 shows the percentage of subjects in each age-group for the five year period. These results show that the largest percentage of subjects were in the age group of 7 -12 years. The smallest percentage of subjects were in the over 80 category, followed by the 13-18 year olds.

Table 3.3

Percentage of subjects per age group and speech-language and audiology diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

		Age Group										
		0-6 yrs	7-12 yrs	13-18 yrs	19-29 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-69 yrs	70-79 yrs	80+ yrs	Total
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagnosis	.4%	7.6%	2.8%	9.6%	13.2%	14.4%	15.2%	14.0%	15.6%	7.2%	100%
	% within Age Group	1.6%	12.3%	20.6%	33.8%	30.0%	32.7%	36.9%	35.4%	45.3%	64.3%	29.1%
Voice (n=180)	% within Speech and Audiology Diagnosis		.5%	.5%	12.1%	29.7%	24.7%	12.6%	13.7%	5.5%	.5%	100%
	% within Age Group		.6%	2.9%	31.0%	49.1%	40.9%	22.3%	25.3%	11.6%	3.6%	21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagnosis	.9%	.9%		9.9%	10.8%	17.1%	24.3%	18.0%	14.4%	3.6%	100%
	% within Age Group	1.6%	.6%		15.5%	10.9%	17.3%	26.2%	20.2%	18.6%	14.3%	12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagnosis			6.7%		6.7%	6.7%	33.3%	33.3%	6.7%	6.7%	100%
	% within Age Group			2.9%		.9%	.9%	4.9%	5.1%	1.2%	3.6%	1.7%
Dysphagia and Neuro Communication (n=37)	% within Speech and Audiology Diagnosis			2.7%	5.4%	2.7%	5.4%	13.5%	24.3%	37.8%	8.1%	100%
	% within Age Group			2.9%	2.8%	.9%	1.8%	4.9%	9.1%	16.3%	10.7%	4.3%
Fluency (n=71)	% within Speech and Audiology Diagnosis	19.7%	53.5%	16.9%	8.5%	1.4%						100%
	% within Age Group	22.2%	24.5%	35.3%	8.5%	.9%						8.3%
Phonology/Articulation/ Oral Motor (n=23)	% within Speech and Audiology Diagnosis	26.1%	60.9%	4.3%	4.3%	4.3%						100%
	% within Age Group	9.5%	9.0%	2.9%	1.4%	.9%						2.7%
Language (n=23)	% within Speech and Audiology Diagnosis	65.2%	30.4%	4.3%								100%
	% within Age Group	23.8%	4.5%	2.9%								2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagnosis	3.3%	83.3%	13.3%								100%
	% within Age Group	1.6%	16.1%	11.8%								3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagnosis	33.9%	62.5%	3.6%								100%
	% within Age Group	30.2%	22.6%	5.9%								6.5%
None (n=43)	% within Speech and Audiology Diagnosis	14.0%	30.2%	7.0%	7.0%	14.0%	14.0%	7.0%	7.0%			100%
	% within Age Group	9.5%	8.4%	8.8%	4.2%	5.5%	5.5%	2.9%	3.0%			5.0%
Missing (n=10)	% within Speech and Audiology Diagnosis				10.0%	10.0%		10.0%	20.0%	40.0%	10.0%	100%
	% within Age Group				1.4%	.9%		1.0%	2.0%	4.7%	3.6%	1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagnosis						50.0%			50.0%		100%
	% within Age Group						.9%			1.2%		.2%
Other (n=4)	% within Speech and Audiology Diagnosis		50.0%					25.0%		25.0%		100%
	% within Age Group		1.3%					1.0%		1.2%		.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagnosis			50.0%	50.0%							100%
	% within Age Group			2.9%	1.4%							.2%
Total (n=859)	% within Speech and Audiology Diagnosis	7.3%	18.0%	4.0%	8.3%	12.8%	12.8%	12.0%	11.5%	10.0%	3.3%	100%
	% within Age Group	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Percentages varied from year to year, but showed a similar pattern of results across the years. There was a slight drop in the number of children seen in 2000 and 2001. The number of teenagers seen increased from 1999 to 2002, but dropped in 2003.

- Subjects with a hearing loss or tinnitus covered the full range of ages, although the majority of patients were between 30 and 79 years of age.
- 64.3 % of the over 80 subjects attending the clinic attended for hearing loss or tinnitus.
- The majority of voice disordered subjects were between 30 and 49 years of age. Almost half (49.1%) of the 30-39 year olds who attended the clinic attended for a voice disorder.
- Subjects with a neurological communication disorder covered a wide range of ages, although the highest percentage were for the 50-59 years olds, with slightly less in the 40-49 and 60-69 age group.
- Subjects with dysphagia were mostly between 50 and 69 years of age, while those with dysphagia and a neurological communication disorder were slightly older, between 60 and 79 years.
- The age of subjects attending the clinic for fluency ranged from the 0-6 age group up to 30-39 years of age, although the majority were under 18. A similar trend occurred for phonology/articulation, although the majority were under 12.
- Children with language difficulties, language and learning difficulties and multiple difficulties ranged from 0-18 years, with only a small percentage above 12 years.
- The most language difficulties occurred in the 0-6 year age group, while children with language and learning difficulties or multiple difficulties had a greater percentage in the 7-12 year olds.

This information is shown in Table 3.3. .

3.3.2. Gender Data

Slightly more than half of the sample was male (51.6 %). The percentages remained fairly consistent across the 5 years, varying from 43.1 to 55.2 % for males and 44.8 to 56.9 % for females. There were more males than females in every year except for 2000, where there were more females

There were more female than male voice cases, language cases and subjects without a speech or audiology diagnosis. For all other categories there were more males than females, except for equal males and females for the category of voice and dysphagia and the category 'other'. These last two categories had very small numbers of subjects.

3.3.3. Home Language

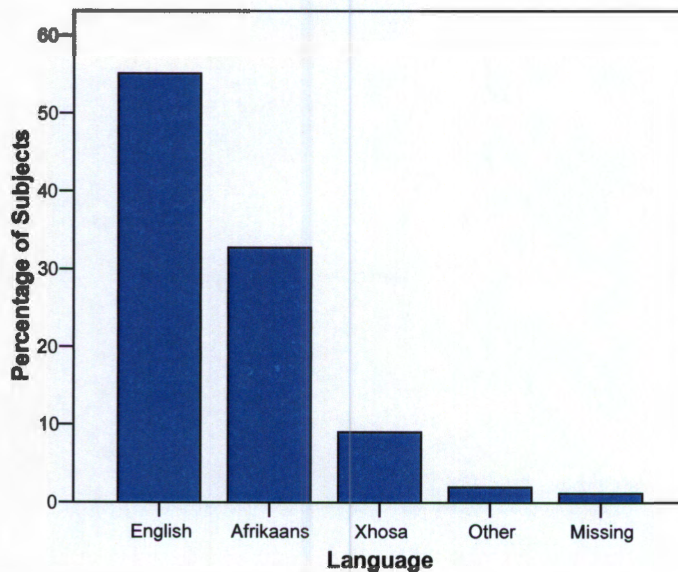


Figure 3.5

Percentage of subjects per home language group who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=910)

The majority of subjects, as shown in Figure 3.4, were English or Afrikaans speaking, with a smaller percentage speaking Xhosa or another language.

Similar trends occur within each year, although there was a slight increase in Xhosa speaking patients and a decrease in those categorized as other in 2002 and 2003.

In terms of home language similar trends occur across disorders, with the highest percentage always English. When looking only at the Xhosa clients, the highest percentages of these clients attended for a hearing loss or a neurological communication disorder, with lower percentages for the other disorders.

3.3.4. Occupation

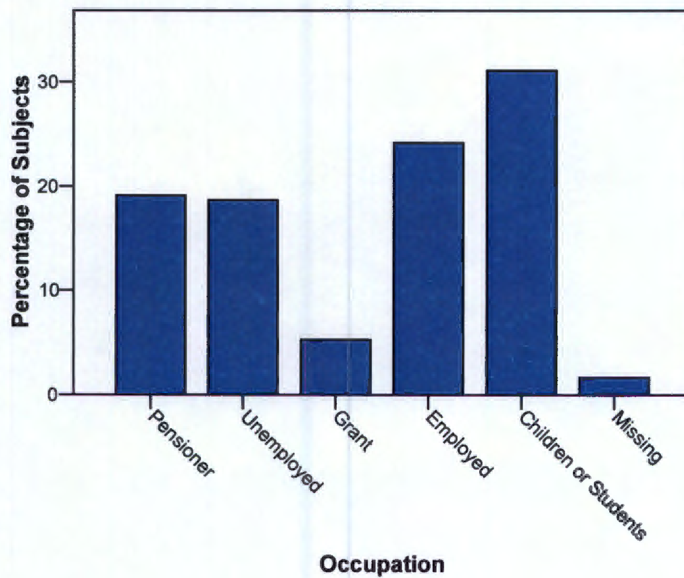


Figure 3.6

Percentage of subjects per occupational category who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=910)

The majority of the subjects were children or students. The next largest category was for those who were employed, followed by pensioners and being unemployed. A small percentage received grants. Figure 3.6 show this data.

In 2000 and 2001 there was a drop in the number of children or students seen, with an increase in the number of pensioners.

- 31.6 % of the hearing loss subjects were pensioners, followed by 29.6 % who were employed.
- More than half of the voice patients were employed.
- A large proportion (40.5 %) of subjects with a neurological communication disorder were unemployed, while 56.8 % of those with dysphagia and a neurological communication disorder were pensioners.

The percentages for speech-language and audiology diagnoses and occupation are given in Table 3.4.

Table 3.4

Percentage of subjects within each speech-language and audiology diagnosis and occupational category who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

		Occupation						
		Pensioner	Unemployed	Grant	Employed	Not applicable	Missing	Total
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagnosis	31.6%	18.8%	5.2%	29.6%	12.0%	2.8%	100.0%
	% within Occupation	46.7%	29.6%	27.7%	35.1%	11.6%	50.0%	29.1%
Voice (n=180)	% within Speech and Audiology Diagnosis	15.9%	23.1%	3.8%	53.8%	1.6%	1.6%	100.0%
	% within Occupation	17.2%	26.4%	14.9%	46.4%	1.2%	21.4%	21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagnosis	28.8%	40.5%	15.3%	10.8%	2.7%	1.8%	100.0%
	% within Occupation	18.9%	28.3%	36.2%	5.7%	1.2%	14.3%	12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagnosis	6.7%	20.0%	33.3%	26.7%	6.7%	6.7%	100.0%
	% within Occupation	.6%	1.9%	10.6%	1.9%	.4%	7.1%	1.7%
Dysphagia and Neuro Communication (n=37)	% within Speech and Audiology Diagnosis	56.8%	29.7%	8.1%	5.4%			100.0%
	% within Occupation	12.4%	6.9%	6.4%	.9%			4.3%
Fluency (n=71)	% within Speech and Audiology Diagnosis		1.4%		5.6%	93.0%		100.0%
	% within Occupation		.6%		1.9%	25.5%		8.3%
Phonology/Articulation/ Oral Motor (n=23)	% within Speech and Audiology Diagnosis				4.3%	95.7%		100.0%
	% within Occupation				.5%	8.5%		2.7%
Language (n=23)	% within Speech and Audiology Diagnosis					100.0%		100.0%
	% within Occupation					8.9%		2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagnosis					100.0%		100.0%
	% within Occupation					11.6%		3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagnosis					100.0%		100.0%
	% within Occupation					21.6%		6.5%
None (n=43)	% within Speech and Audiology Diagnosis	2.3%	14.0%	2.3%	30.2%	51.2%		100.0%
	% within Occupation	.6%	3.8%	2.1%	6.2%	8.5%		5.0%
Missing (n=10)	% within Speech and Audiology Diagnosis	40.0%	30.0%		20.0%		10.0%	100.0%
	% within Occupation	2.4%	1.9%		.9%		7.1%	1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagnosis	50.0%	50.0%					100.0%
	% within Occupation	.6%	.6%					.2%
Other (n=4)	% within Speech and Audiology Diagnosis	25.0%			25.0%	50.0%		100.0%
	% within Occupation	.6%			.5%	.8%		.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagnosis			50.0%		50.0%		100.0%
	% within Occupation			2.1%		.4%		.2%
Total (n=859)	% within Speech and Audiology Diagnosis	19.7%	18.5%	5.5%	24.6%	30.2%	1.6%	100.0%
	% within Occupation	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

3.3.5. Marital Status

Again a high percentage were children, where marital status does not apply. Of the adult population, the majority were married. This data is represented in Figure 3.7. When looking at the data for each year there seemed to be a decrease in single people from 2000 to 2003.

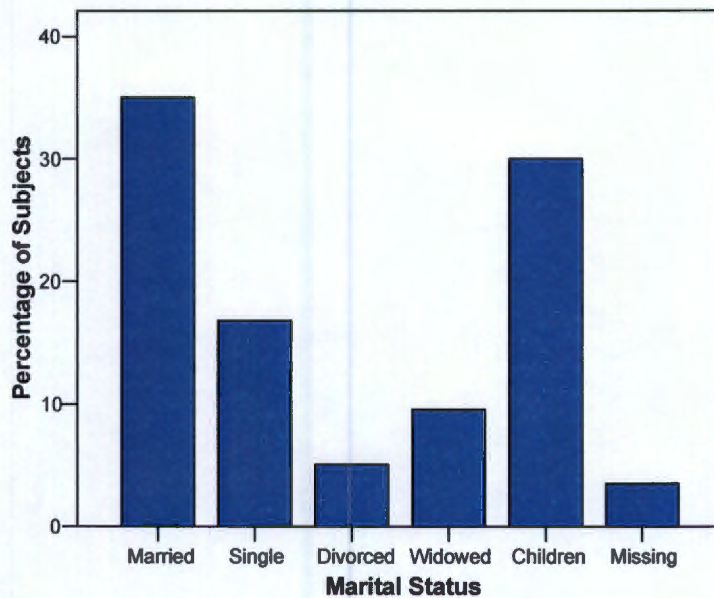


Figure 3.7

Percentage of subjects per marital status category who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=910)

Over half of the subjects who had voice, neurological communication, dysphagia, or dysphagia and neurological communication disorders were married. 37.6 % of hearing loss subjects were married, but there was a greater percentage of them widowed than for the other disorders. 54 % of the widowed subjects attended for a hearing loss.

3.3.6. Geographical Location

Figure 3.8 shows the percentages of subjects from each health district.

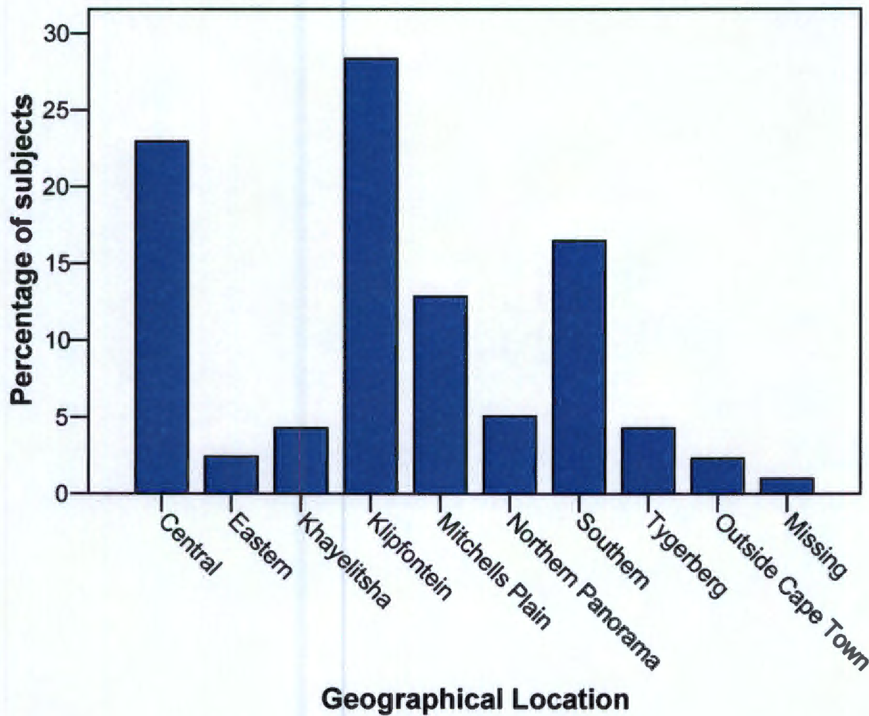


Figure 3.8

Percentage of subjects from each geographical location who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=910)

The largest percentage of subjects came from the Klipfontein area. A large percentage came from the Central region as well, with slightly less from Southern district and then Mitchells Plain. The smallest percentage from within the Cape Town area came from the Eastern region. These percentages can be compared to the user population from each area, which can be found in Appendix E.

Table 3.5

Percentage of subjects per speech-language and audiology diagnosis and geographical location who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=859)

		Geographical Location										
		Central	Eastern	Khayelitsha	Klipfontein	Mitchells Plain	Northern Panorama	Southern	Tygerberg	Outside Cape Town	Missing	Total
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagnosis	28.0%	1.2%	6.0%	28.0%	8.4%	6.4%	11.2%	6.0%	2.8%	2.0%	100.0%
	% within Geographical Location	36.1%	15.0%	40.5%	28.6%	18.9%	35.6%	19.9%	41.7%	33.3%	55.6%	29.1%
Voice (n=180)	% within Speech and Audiology Diagnosis	15.9%	6.0%	2.7%	24.2%	18.7%	6.0%	17.0%	4.9%	3.8%	.5%	100.0%
	% within Geographical Location	14.9%	55.0%	13.5%	18.0%	30.6%	24.4%	22.0%	25.0%	33.3%	11.1%	21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagnosis	23.4%		2.7%	38.7%	12.6%	1.8%	17.1%	.9%	1.8%	.9%	100.0%
	% within Geographical Location	13.4%		8.1%	17.6%	12.6%	4.4%	13.5%	2.8%	9.5%	11.1%	12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagnosis	6.7%			46.7%	20.0%	6.7%	20.0%				100.0%
	% within Geographical Location	.5%			2.9%	2.7%	2.2%	2.1%				1.7%
Dysphagia and Neuro Communication (n=37)	% within Speech and Audiology Diagnosis	13.5%		5.4%	35.1%	13.5%	2.7%	27.0%		2.7%		100.0%
	% within Geographical Location	2.6%		5.4%	5.3%	4.5%	2.2%	7.1%		4.8%		4.3%
Fluency (n=71)	% within Speech and Audiology Diagnosis	21.1%	5.6%	1.4%	26.8%	11.3%		23.9%	8.5%		1.4%	100.0%
	% within Geographical Location	7.7%	20.0%	2.7%	7.8%	7.2%		12.1%	16.7%		11.1%	8.3%
Phonology/Articulation/ Oral Motor (n=23)	% within Speech and Audiology Diagnosis	21.7%		4.3%	39.1%	4.3%	8.7%	21.7%				100.0%
	% within Geographical Location	2.6%		2.7%	3.7%	.9%	4.4%	3.5%				2.7%
Language (n=23)	% within Speech and Audiology Diagnosis	13.0%		4.3%	21.7%	17.4%	4.3%	30.4%		8.7%		100.0%
	% within Geographical Location	1.5%		2.7%	2.0%	3.6%	2.2%	5.0%		9.5%		2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagnosis	16.7%		6.7%	20.0%	16.7%	6.7%	30.0%	3.3%			100.0%
	% within Geographical Location	2.6%		5.4%	2.4%	4.5%	4.4%	6.4%	2.8%			3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagnosis	32.1%	1.8%	3.6%	28.6%	12.5%	1.8%	16.1%	3.6%			100.0%
	% within Geographical Location	9.3%	5.0%	5.4%	6.5%	6.3%	2.2%	6.4%	5.6%			6.5%
None (n=43)	% within Speech and Audiology Diagnosis	34.9%	2.3%	7.0%	18.6%	11.6%	16.3%	2.3%	2.3%	2.3%	2.3%	100.0%
	% within Geographical Location	7.7%	5.0%	8.1%	3.3%	4.5%	15.6%	.7%	2.8%	4.8%	11.1%	5.0%
Missing (n=10)	% within Speech and Audiology Diagnosis	10.0%		10.0%	20.0%	10.0%	10.0%	20.0%	10.0%	10.0%		100.0%
	% within Geographical Location	.5%		2.7%	.8%	.9%	2.2%	1.4%	2.8%	4.8%		1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagnosis				50.0%	50.0%						100.0%
	% within Geographical Location				.4%	.9%						.2%
Other (n=4)	% within Speech and Audiology Diagnosis			25.0%	50.0%	25.0%						100.0%
	% within Geographical Location			2.7%	.8%	.9%						.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagnosis	50.0%				50.0%						100.0%
	% within Geographical Location	.5%				.9%						.2%
Total (n=859)	% within Speech and Audiology Diagnosis	22.6%	2.3%	4.3%	28.5%	12.9%	5.2%	16.4%	4.2%	2.4%	1.0%	100.0%
	% within Geographical Location	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 3.6

Percentage of subjects per geographical location and referral source who attended the Speech Therapy and Audiology OPD from 1999-2003 (n-910)

		Referral Source																
		ENT/ Audiology at Study Hospital	Wards at Study Hospital	Other at Study Hospital	Other Tertiary Hospitals in CT	Hospitals in CT (not tertiary)	Community Clinics	Occupational Health	Education	OAH/ Residential Care	Self	Other	Outsid e of CT	Audio at BCH	Rehabilitation Centres	Missing	Private Sector	Total
Central (n=209)	% within Geographical Location	14.9%	3.1%	6.2%	1.0%	3.1%	11.9%	4.1%	13.4%	2.6%	14.4%	3.1%			4.1%	11.9%	6.2%	100.0%
	% within Referral Source	14.3%	18.8%	20.7%	12.5%	11.5%	28.0%	19.5%	23.4%	41.7%	40.0%	46.2%			25.8%	25.0%	35.3%	22.6%
Eastern (n=22)	% within Geographical Location	50.0%				5.0%			5.0%		10.0%			5.0%		20.0%	5.0%	100.0%
	% within Referral Source	4.9%				1.9%			.9%		2.9%			12.5%		4.3%	2.9%	2.3%
Khayelitsha (n=39)	% within Geographical Location	24.3%	2.7%	5.4%	2.7%	5.4%	16.2%	13.5%	2.7%		2.7%		2.7%	2.7%		13.5%	5.4%	100.0%
	% within Referral Source	4.4%	3.1%	3.4%	6.3%	3.8%	7.3%	12.2%	.9%		1.4%		25.0%	12.5%		5.4%	5.9%	4.3%
Klipfontein (n=258)	% within Geographical Location	26.5%	7.8%	8.2%	3.3%	2.4%	10.6%	4.1%	12.7%	1.6%	4.5%		.4%	.8%	5.3%	8.6%	3.3%	100.0%
	% within Referral Source	32.0%	59.4%	34.5%	50.0%	11.5%	31.7%	24.4%	27.9%	33.3%	15.7%		25.0%	25.0%	41.9%	22.8%	23.5%	28.5%
Mitchells Plain (n=117)	% within Geographical Location	31.5%	.9%	9.0%	.9%	9.0%	7.2%	3.6%	12.6%	.9%	7.2%	3.6%			2.7%	7.2%	3.6%	100.0%
	% within Referral Source	17.2%	3.1%	17.2%	6.3%	19.2%	9.8%	9.8%	12.6%	8.3%	11.4%	30.8%			9.7%	8.7%	11.8%	12.9%
Northern Panorama (n=46)	% within Geographical Location	24.4%		6.7%	4.4%	11.1%	2.2%	15.6%	11.1%		2.2%	2.2%		4.4%		15.6%		100.0%
	% within Referral Source	5.4%		5.2%	12.5%	9.6%	1.2%	17.1%	4.5%		1.4%	7.7%		25.0%		7.6%		5.2%
Southern (n=150)	% within Geographical Location	17.0%	2.8%	7.1%	.7%	13.5%	11.3%	1.4%	17.7%	1.4%	9.9%				3.5%	11.3%	2.1%	100.0%
	% within Referral Source	11.8%	12.5%	17.2%	6.3%	36.5%	19.5%	4.9%	22.5%	16.7%	20.0%				16.1%	17.4%	8.8%	16.4%
Tygerberg (n=39)	% within Geographical Location	33.3%					2.8%	8.3%	22.2%		8.3%	2.8%	2.8%	2.8%	2.8%	8.3%	5.6%	100.0%
	% within Referral Source	5.9%					1.2%	7.3%	7.2%		4.3%	7.7%	25.0%	12.5%	3.2%	3.3%	5.9%	4.2%
Outside Cape Town (n=21)	% within Geographical Location	33.3%	4.8%		4.8%	14.3%					9.5%	4.8%	4.8%	4.8%		9.5%	9.5%	100.0%
	% within Referral Source	3.4%	3.1%		6.3%	5.8%					2.9%	7.7%	25.0%	12.5%		2.2%	5.9%	2.4%
Missing (n=9)	% within Geographical Location	11.1%		11.1%			11.1%	22.2%							11.1%	33.3%		100.0%
	% within Referral Source	.5%		1.7%			1.2%	4.9%							3.2%	3.3%		1.0%
Total (n=910)	% within Geographical Location	23.6%	3.7%	6.8%	1.9%	6.1%	9.5%	4.8%	12.9%	1.4%	8.1%	1.5%	.5%	.9%	3.6%	10.7%	4.0%	100.0%
	% within Referral Source	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Across the years, Klipfontein and Central areas seem to be the main areas from which the subjects came.

- 40.5 % of the subjects from Khayelitsha and 41.7 % of the subjects from Tygerberg who attended the clinic attended for a hearing loss.
- 55 % of subjects from Eastern district attended for voice.
- 66.6 % of the subjects from outside of Cape Town attended for hearing loss or voice.

These results are shown in Table 3.5.

- Half of the subjects from the Eastern district were referred by ENT/Audiology at the study hospital.
- 41.7 % of old age home/residential care referrals, 40 % of self-referrals and 46.2 % of referrals from sources other than those given were from Central district.
- 35.3 % of private sector referrals were for subjects residing in the Central district.
- 41.9 % of referrals from rehabilitation centres were for subjects from the Klipfontein district.
- 50 % of subjects referred from other non-tertiary hospitals in Cape Town were from the Klipfontein district.

Table 3.6 provides further detail of these results.

3.4. Attendance Data

3.4.1. Introduction

Attendance data was captured in several different ways. These were the number of appointments that were attended, the time period over which these appointments were booked and percentage of appointments attended. The category which seemed to give the most meaningful data was that of the time period, which documented over how many months each client had scheduled appointments. Percentage data was useful when looked at with respect to the total number of scheduled appointments.

Thus the attendance data is presented in three ways:

1. Time period over which a client had scheduled appointments
2. Number of appointments attended
3. Percentage of appointments attended

Attendance data was then also related to disorders as different disorders require different treatment regimes, with different expectations regarding number of appointments that should be attended.

3.4.2. Time Period

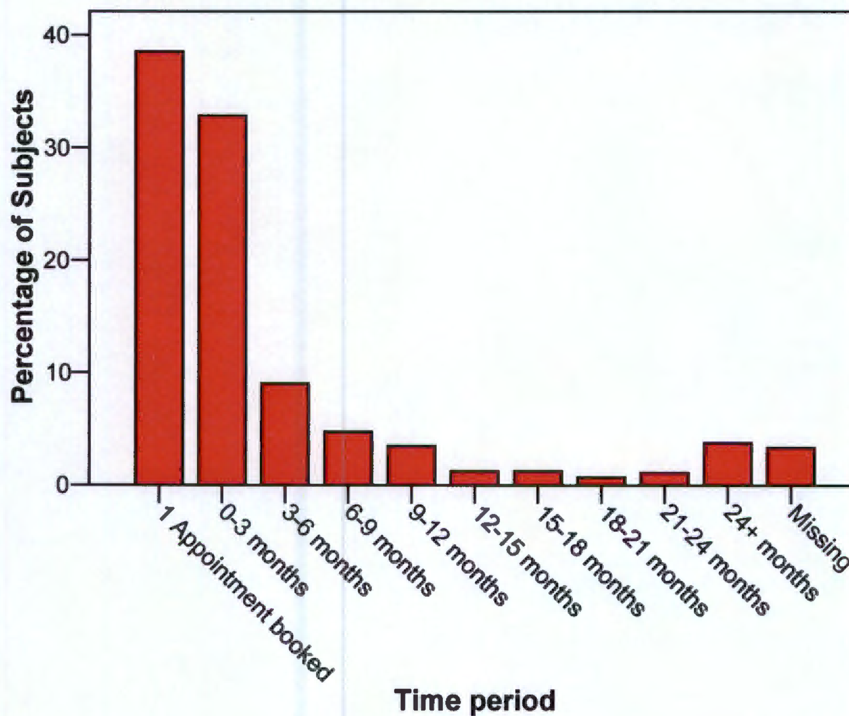


Figure 3.9

Percentage of subjects with scheduled appointments across different time frames from the subjects who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=719)

The majority of subjects (71.3%) attended one appointment (where only one was booked) or had scheduled appointments over a 3 month period. A further 9.1 % attended for between 3 and 6 months and 8.2 % between 6 months and a year. Only 8.1 % of subjects attended appointments for a period of time more than one year since their initial appointment. Data about time frame was missing for 3.3 % of subjects. These results are shown in more detail in Figure 3.9.

3.4.3. Number of Appointments Attended

Figure 3.10 shows the percentage of subjects who attended the different numbers of appointments.

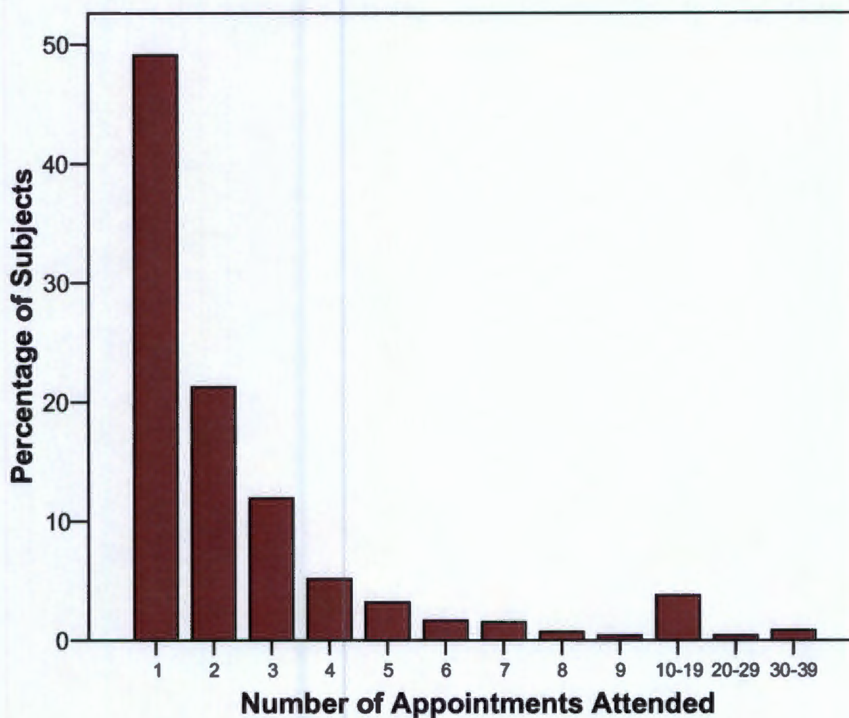


Figure 3.10

The number of appointments attended by different percentages of subjects who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=719)

Table 3.7

Percentage of subjects per speech-language and audiology disorder and number of appointments attended from the subjects who attended the Speech Therapy and Audiology OPD from 1999-2003 (n=719)

	Number of Appointments Attended												Total
	1	2	3	4	5	6	7	8	9	10-19	20-29	30-39	
Hearing Loss/Tinnitus (n=220)	54.1%	18.6%	13.2%	6.4%	2.7%	.9%	.5%	.5%		2.7%		.5%	100.0%
Voice (n=148)	36.5%	30.4%	17.6%	4.7%	3.4%	1.4%	2.0%	.7%		3.4%			100.0%
Neuro Communication (n=84)	46.4%	17.9%	19.0%	3.6%	4.8%	1.2%	2.4%			4.8%			100.0%
Dysphagia (n=13)	46.2%	30.8%		7.7%	7.7%	7.7%							100.0%
Dysphagia and Neuro Communication (n=33)	33.3%	30.3%	18.2%	9.1%	9.1%								100.0%
Fluency (n=54)	42.6%	18.5%	5.6%	5.6%		1.9%	5.6%	1.9%	1.9%	14.8%		1.9%	100.0%
Phonology/Articulation/Oral Motor (n=23)	43.5%	21.7%	13.0%	4.3%	4.3%				4.3%	8.7%			100.0%
Language (n=21)	47.6%	19.0%		4.8%	4.8%	9.5%	4.8%	9.5%					100.0%
Language and Learning Disability (n=25)	52.0%	32.0%		8.0%						4.0%	4.0%		100.0%
Multiple Difficulties (Paediatrics) (n=48)	45.8%	14.6%	6.3%	4.2%	4.2%	6.3%	2.1%		2.1%	2.1%	4.2%	8.3%	100.0%
None (n=41)	90.2%	9.8%											100.0%
Missing (n=4)	100.0%												100.0%
Other (n=3)	100.0%												100.0%
Undiagnosed (n=2)	100.0%												100.0%
Total (n=719)	49.1% (n=353)	21.3 % (n=153)	12.0% (n=86)	5.1% (n=37)	3.2% (n=23)	1.7% (n=12)	1.5% (n=11)	.7% (n=5)	.4% (n=3)	3.8% (n=27)	.4% (n=3)	.8% (n=6)	100.0%

- A large proportion of subjects (49.1 %) only attended 1 appointment.
- 82.4 % of subjects attended from 1 to 3 appointments.
- With each additional appointment from 1 to 6 appointments attended, the percentage of subjects attending approximately halved.

Table 3.7 presents the number of appointments attended by disorder. The only categories which had more than 10 % of subjects attending in excess of 5 appointments were for the categories of fluency (28%), phonology/articulation/oral motor (13%), language (23.8 %) and paediatrics with multiple difficulties (25.1 %).

3.4.4. Percentage of Appointments Attended

The more scheduled appointments there were the poorer the attendance became. Thus 40.8 % of subjects who had less than 5 appointments attended all of their appointments, while for those who had 6-9 appointments this decreased to 11.4 % and 5.6 % for 10-19 appointments. Where more than 19 appointments were scheduled, although this was only for a small number of subjects, 0 % attended 100 % of appointments

3.5. Summary of Chapter 3

This chapter has documented the results of the study. Diagnostic, demographic and attendance variable results have been presented. For the former two categories data was presented for the sample across the 5 year period and then, where trends were evident, changes across the 5 year period were mentioned. Results were also related to speech-language and audiology diagnosis. Tables and Graphs were used to highlight trends.

Chapter 4

Discussion

4.1. Introduction

This chapter will highlight and discuss trends found in Chapter 3. This discussion is selective as it presents robust trends as they relate to the aims and results of the study. Selected issues around the diagnostic and demographic variables discussed are speech-language and audiology diagnoses, referral sources, age, gender and language. This is followed by a discussion regarding the attendance results. The data presented here cannot provide explanations, but rather represents the state of affairs pertaining to a sample of the study population over a period of time (Enderby and Petheram, 2001). The aim of the study was to describe data and to relate these findings to healthcare in South Africa, but not to generalize the results to all Speech Therapy and Audiology services in South Africa. The interpretation occurs against the context, realities and literature and tentative explanations are suggested.

4.2. Client Profiles: Diagnostic and Demographic Variables

Speech-Language and Audiology Disorder

There are several significant issues around the types of disorders seen and the percentage of subjects attending for each disorder (Figure 3.1). The highest percentages of subjects were diagnosed with a hearing loss or voice disorder. The reason for high percentages of subjects attending with these disorders, may be due to the fact that this Speech Therapy and Audiology OPD is situated in a tertiary hospital, with specialized equipment and facilities suitable for treating these disorders. This hospital is geared towards treating the adult population, with the Speech Therapy and Audiology OPD being one of the few out-patient departments treating children.

Due to the fact that these disorders (hearing loss and voice), as well as neurological communication disorders which had the third highest percentage of subjects, are medically based and are treated by the medical profession in conjunction with Speech Therapists and Audiologists, clients may be likely to attend this hospital which offers both services. Hearing loss, voice and neurological communication disorders are often acquired and therefore there is a 'loss' of function, making the disorder noticeable and igniting a desire or need to restore lost function. The proximity and connections to the Ear, Nose and Throat (ENT) department, who made the largest percentage of referrals to the Speech Therapy and Audiology OPD, can also account for the high percentages of subjects with hearing loss or voice disorders.

The high percentage of subjects with hearing disorders in this study is similar to the findings of Schneider (1992), who also found that hearing disorders made up the largest percentage of the caseload seen by Community Speech and Hearing Workers in Gazankulu. Although a direct comparison of trends around disorders cannot be made to the study by Petheram and Enderby (2001) as they studied speech-language diagnoses only (Audiology diagnoses were not included), they had a much smaller percentage of voice disorders than found in the current study.

Neurological communication disorders and fluency disorders were the diagnostic categories that had the third and fourth highest percentages of subjects (Figure 3.1). These two disorders, together with hearing loss and voice disorders, are 'noticeable' and thus easier to detect than less 'visible' disorders (McLaren et al., 2004) and are likely to impact on everyday communication. Less 'visible' disorders, such as a language impairment, may not be as easily noticeable in everyday situations and thus are not as easily detected. These less 'visible' disorders are then not as likely to be referred to Speech Therapy and Audiology services.

Similarly the higher number of children with multiple difficulties, compared to those with just one disorder, may be due to the fact that these children often had a fluency disorder or phonology difficulty, again making their disorder more 'visible'. Another possible reason for these children with multiple difficulties being referred, is that the 'problems' may be so great that help has to be sought.

This study recorded a low number of subjects with dysphagia (including those with dysphagia and a neurological communication disorder) in comparison to other studies (e.g. Petheram and Enderby, 2001). The majority of these subjects' dysphagia had resulted from a CVA. This

low percentage of subjects with dysphagia may be due to the fact that this study only included out-patients and many of the dysphagia cases would have been treated as in-patients, in the acute stages after a stroke, and their swallowing problems may have resolved. The number of dysphagia cases related to the number of neurological communication disorders contrasts in some ways with other literature. Marshall, Atkinson, Thacker and Woll (2003) commented on a general trend that Speech Therapists are spending more time working with swallowing problems (dysphagia) than with aphasia.

However, there was a small increase in the percentage of dysphagia subjects in this study each year from 1999 to 2002, although there was a drop in 2003. Similarly, Petheram and Enderby (2001) and Heron (2001) noticed increases in the number of dysphagia clients over time. The increase in clients presenting with dysphagia may be the result of increasing evidence that attending to dysphagia affects the morbidity as well as the mortality of these clients (Petheram and Enderby, 2001). The increase in dysphagia subjects in this study over time, although slight, may be expected, due to the increased awareness of the Speech Therapist's role in treating dysphagia, but the reason for the drop-off in 2003 is unclear.

Referral Source

Referral sources (shown in Figure 3.3.) would also have shaped the client diagnostic profiles discussed above. As mentioned earlier, the ENT department, made a significant percentage of referrals to the Speech Therapy and Audiology OPD. This is understandable in light of the discussion around disorders. The second major referrer was the education sector. This may be because there are limited Speech Therapy and Audiology services within mainstream schools (F. Lewis, personal communication, February 18, 2005), resulting in any difficulties experienced by children within these schools being referred to services in the health sector.

Self-referrals comprised 8.1 % of the referrals. Referrals by parents are an important source of referral (Edwards et al., 1989) and it may be that parents are indirectly responsible for more referrals as a result of raising concerns with professionals who then refer the child (Stow and Dodd, 2003). Another interesting finding was that a quarter of self-referrals were for fluency subjects, with another quarter for hearing loss. This may be due to the overt difficulties these subjects and their families experience.

The top referrers in this study were the ENT/Audiology Department, followed by education, community clinics, self referrals and other departments at the study hospital (apart from ENT and wards), and other non-tertiary hospitals. Enderby and Petheram (2000) reported the top referrers in their study being health visitors, educational services, ENT surgeons, GPs, geriatric medicine and general medicine. Thus in both studies ENT services and education were major sources of referral. The pattern of referral sources noted in this study may also be biased by the fact that client's who missed their initial appointment were not included in the study.

Age Group Trends

Despite the high number of hearing loss and voice cases, which in this study were found predominantly in the adult population, the majority of the caseload in terms of age was made up of 7-12 year olds (Figure 3.4), of whom only a minority attended for a hearing loss or voice disorder. However, this age group contained the majority of the fluency cases, the phonology/articulation/oral motor cases, the cases with language and learning disability, as well as those with multiple difficulties (Table 3.3). A reason for this high percentage of 7-12 year olds, compared to the under 6 population, may be due to the close proximity of another tertiary hospital, which specializes in paediatrics, especially the under 6 population. The high percentage of 7-12 year olds, which are primary school age children, also alerts one to the lack of services within the education system, as mentioned earlier. It should also be remembered that the education sector was the second highest referral source. Despite the policy regarding inclusive education (Department of Education, 2001), little seems to have changed with regard to Speech Therapy and Audiology services within the educational system in the Western Cape. There are no services or support for learners with speech, language, learning or hearing difficulties in the Education system outside of services provided in specialized schools.

The researcher has also perceived that there is generally a lack of knowledge amongst educators, many health professionals and the public, about Speech Therapy and Audiology services, resulting in 'late' referrals. In the experience of the researcher it has been noted that many is the time parents have commented that they had asked a health professional about their concerns regarding their child's speech or language development when their child was younger and were told 'not to worry' and that their child would 'grow out of it'. Thus,

instead of the child receiving the early intervention most appropriate, treatment is only received when reaching school age, where there is a high demand on communication skills and the child's difficulties begin to impact on academic performance. This again relates to the 'visibility' of certain disorders (McLaren et al., 2004), as these language and learning disorders are often only detected in an academic environment and are not immediately obvious in everyday situations.

Turning now to the adult population it was interesting to note a slight decrease in percentage of subjects within each 10 year category from 30 to 69 years, with a slightly larger drop off at 70-79 years and a large drop off in the 80+ category of those attending this out-patient department. However, this may not be so surprising considering the large number of voice cases in the sample, with the highest percentage of these in the 30-39 year old category, followed by the 40-49 year old category. These voice cases would then have increased the number of younger adults attending. This age trend amongst subjects with voice disorders, differs from the findings of Coyle, Weinrich and Stemple (2001), who found the biggest percentage of voice cases to be between 45-64 years.

This finding of a decrease in clients with increasing age however seems to be part of a general trend in rehabilitation, where less services are available for the older population, who also have greater difficulty attending these services. It has been documented that, although disability is more prevalent in the older population, there seem to be fewer rehabilitation services offered to older clients than to younger clients. Blake (1981) claims that, in terms of age group, participation in the rehabilitation service seems to be inversely related to the need for such service. A study at Groote Schuur Hospital (Whitelaw et al., 1994) highlighted this fact and found that 82 % of stroke patients under the age of 65 years old, who had been in-patients, were referred (as out-patients) to physiotherapy, while only 55 % of clients above 65 were referred. In addition all of the younger ones presented for physiotherapy, while only 41% of the older clients actually received therapy. Similarly, 71 % of the younger group were referred for Occupational Therapy and all received therapy, while 45 % of older clients were referred and only one client (7%) actually received therapy. Another study in the Western Cape examined rehabilitation services at Bishop Lavis Rehabilitation Centre and it was documented that 50 % of the population attending these services were 60 years old or younger (Rhoda, 2001).

Thus there may be a higher percentage of clients who have had a CVA in the younger population than expected. Another possibility is that younger people are more likely to attend rehabilitation, as noted above, as it may be more of a priority for them, or services may be more accessible for them, than for the older population. Rehabilitation has previously been driven both philosophically and financially by the goal of restoring individuals to productive employment, resulting in better opportunities for younger clients, although this is now changing (Raia, 1992). The motivation to attend rehabilitation may be greater for the younger adults due to their need to regain employment, as well as to pursue social goals.

In the light of the above discussion around rehabilitation for different age groups of clients, the current study found that a large percentage (63.9%) of clients with a neurological communication disorder were under the age of 60 years old. This dropped to 29.7 % for those with dysphagia and neurological communication disorder, possibly indicating a greater degree of disability in the older age groups, where multiple disabilities are perhaps more likely. This may also reduce the number of these older clients attending out-patient rehabilitation. Elderly clients appear not only more handicapped by a stroke, but also have more problems reaching therapists (Whitelaw et al., 1994). Older clients may also be more likely to die from a stroke than younger clients (Whitelaw et al., 1994).

The overall age profiles found in this study differ from those found by Enderby and Petheram (2001), whose largest age-group was in the 0-5 population. However, the structures of the study sites were very different, and similarities in demographic results would thus not be expected. Almost half of this study's subjects (48.5%) were in the age range of 30 to 69, whereas, although slightly different age categories were used, only 18.17 % of their study population was between 31 and 70 years of age. These differences point to the importance of context when studying different services.

Gender Patterns

It was a surprise to find almost similar percentages of male and female subjects (see section 3.3.2.), as the expectation was that there would be many more males than females. This trend, however, becomes clearer when one considers gender in relation to the different disorders.

The only disorders where there were more female than male subjects were voice disorders, language disorders and those who had no speech-language or audiology diagnosis. This then helps to clarify the picture. There are generally more females than males presenting with voice disorders (Coyle et al., 2001), and voice disorders made up a large percentage of subjects. The reason why there were more female than male language disorders may be due to more males having language disorders coupled with learning disorders and the fact that more of the language disorders fell into the 0-6 year old category. There is a perception that 'boys develop more slowly' or 'boys are slower to talk' (Phillips, 2004) and they might therefore be brought later for therapy, when they would more likely be diagnosed as having a language and learning difficulty. Of all the other disorders found mostly in children, all had much higher percentages of males than females. Several authors have commented on the greater likelihood of reading difficulties or dyslexia in males than in females (Owens, 1999; Pain and Central Nervous System Week, 2004) and that children with dyslexia have delayed language development. Also, as expected, more boys than girls stuttered (Guitar, 1998).

These findings differ from trends found in other studies, such as that found by Enderby and Petheram (2001), where their caseload was made up of 59.9% males and 40.1 % females. Broomfield and Dodd (2004) found 70 % of all referrals were for males. However, a direct comparison cannot be made to this study as they only examined a paediatric population. In a study of the literature by Law, Boyle, Harris, Harkness and Nye (2000) it was found that the majority of studies showed that marked speech and language delays were more common in males than females. Their findings were again, however, based on a paediatric population.

Language

The highest percentage of subjects were English speaking, followed by those speaking Afrikaans (Figure 3.4.). This is interesting considering that 55.3 % of the population in the Western Cape speak Afrikaans as a home language, 19.3 % speak English as a home language and 23.7 % speak Xhosa as a home language (SA's People by Province, viewed February 2005). There are several possible reasons for this anomaly.

Firstly, English may be the preferred language of intervention for several reasons. The majority of Speech Therapists and Audiologists working in the Speech Therapy and Audiology OPD at this tertiary hospital in the Western Cape are English first language

speaking and have Afrikaans as a second language. Also many children are being schooled in English, as English is the language most commonly used as the medium of instruction (Alant, 1989) and thus they may receive therapy in English. Secondly, there are no Xhosa speaking Speech Therapists or Audiologists at the study hospital and no access to interpreters, resulting in limited provision of services to the Xhosa population. This situation as it exists, is of grave concern.

Swartz (1998) discusses the issue of language and the use of interpreters in the field of mental health, and discussed the instance of a hospital who had no staff high in the mental health hierarchy who could speak Xhosa, and there were no posts for interpreters at the hospital. He then comments that this raises questions about the hospital's commitment, at that time, to equal care for all its clients. A similar situation seems to be occurring in the Speech Therapy and Audiology OPD at this tertiary hospital under study. Thus there seems to be little movement away from the language bias towards English and Afrikaans Speech Therapy and Audiology service provision within this institution.

Xhosa subjects were more likely to attend for a neurological communication disorder, hearing loss or multiple difficulties than for other disorders. Although large percentages were reflected as Xhosa speaking subjects in the categories of 'Other' and 'Undiagnosed', this was due to the small number of subjects in each of these categories.

Different cultures also view disability in different ways and this may impact on whether or not different sectors of the population are likely to attend the hospital. In much of the world, including Southern Africa, the professional sector is almost synonymous with Western biomedicine (Swartz, 1998). There are also other healing resources, such as indigenous healers and religious healers, who are widely used (Swartz, 1998) and these may be utilized more in certain communities than in others. Related to this are cultural perceptions of disability. In African families the perception of disability is often characterized by an attitude of fatalism (Swanepoel, 2005) and this may lead to an accepting, passive stance to a disabling condition. Therefore services may be less likely to be accessed by this sector of the population.

Poverty may also affect who is likely to attend Speech Therapy and Audiology services and, although poverty is not confined to one racial group in South Africa, it is concentrated amongst the black population (Swanepoel, 2005). Therefore many of the Xhosa speaking

population in the Western Cape, the majority of whom would be black, may have a low income, and thus to fund the trip to the hospital, as well as cover hospital fees, may have made reaching these services prohibitive. In poor communities there may also be less awareness about Speech Therapy and Audiology services due to lack of resources and facilities in these areas. In addition, the study hospital has historically been a 'white' hospital, and there may still be poor understanding about who can access these services. In general, people who live far from healthcare services, or live in conditions of poverty will in all probability have little awareness of services and be unlikely to attend Speech Therapy and Audiology.

4.3. Attendance

The figures of attendance (Figure 3.9, Figure 3.10 and Table 3.7) were significant to look at as the majority of subjects attended only a very short period of therapy. Considering the nature of our profession, where long-term therapy is often indicated, these findings were interesting. Almost half of all the subjects attended only one appointment, with a further 21.3 % of subjects attending 2 appointments. 38.5 % of subjects had only one booked appointment, whereas 49.1 % of subjects attended only one appointment, where they may have had more than one booked appointment. Number of appointments and time frame results show very similar trends, with a drop-off with increasing number of appointments or longer period of time. 71.3 % of subjects attended within a period of up to 3 months, which is similar to the percentage (70.4 %) who attended 2 appointments. Only 9.3 % of subjects attended more than 5 appointments. There are several possible explanations for these findings.

The high number of subjects who only had one booked appointment may be due to the fact that certain subjects would have been placed on a waiting list for therapy and then may not have wanted therapy when it was offered, due to changes of circumstances between the time of the assessment and the date when therapy was offered. Additionally, there are some cases for which one attendance may be all that is indicated. Some clients may be needing no more than reassurance about their condition, and once their concerns have been dealt with they no longer feel the need for further intervention. Enderby and Davies (1989) reported that 60% of newly referred children will require assessment and advice only. This might explain these attendance patterns, but it is unlikely. From the personal experience of the researcher

working in the Speech Therapy and Audiology OPD at the study hospital, only a few clients present with mild difficulties. Therefore, the majority would require some form of further intervention.

The lack of understanding of the profession of Speech Therapy and Audiology by the community, as well as the location of the services within a tertiary hospital environment, may also contribute to poor attendance rates. Many clients have the expectation that a hospital is a place which one attends when ill and that it is a once-off attendance, maybe with a follow-up appointment. Many expect treatment that is tangible, such as medication or surgery. Therefore, many clients arrive with the expectation that they will be given something to 'cure' them in a once off appointment. They may, therefore, not be prepared for the active role that is required of them in the therapeutic process. Also they may be unwilling or unable to commit themselves to further intervention as recommended. The high rate of non-attendance may also reflect the socially disadvantaged nature of the population served and the low priority given to Speech Therapy and Audiology services given other circumstances (Broomfield and Dodd, 2004). In addition there may be difficulties using public transport to access services.

A further explanation for poor attendance could be an issue which affects healthcare in general, where clients do not follow treatments suggested, possibly due to different perceptions of a 'condition'. Negotiating between explanations of illness, it is argued, increases the possibilities of compliance or adherence to treatment (Swartz, 1998). Also discussions prior to commencing therapy about the therapy and respective roles of parent and therapist may well increase parent satisfaction (Roulstone, et al., 2004), which may improve attendance rates.

Fluency, language and multiple difficulties were the only disorders where the attendance of more than 10 % of subjects was in excess of 5 appointments. The motivation for treatment of these disorders may therefore be greater than for other disorders.

With increasing number of appointments, percentage of appointments attended dropped, with 40.8 % of those who had 2-5 appointments attending all of their appointments, while none of those with more than 20 appointments attended all of them (see section 3.4.4.). These figures may also be affected by the decrease in numbers of subjects with an increase in the number of appointments. However, for the 8 subjects who attended more than 30 appointments they all

attended between 60 and 80 % of appointments, with the highest percentage attending between 80 and 89 %. The reasonably high percentage of attendance for this group who had more than 30 appointments is probably because poor attenders usually get discharged earlier in the process, and thus will not reach such a high number of appointments.

However, the fact that the majority of subjects (70.4%) attended no more than 2 appointments is of concern and indicates the need for restructuring of services, in terms of availability of services at a community level, as well as in the nature of treatment offered. From the results of this study it appears that the system does not meet the needs of the majority of the population. Other studies point to realities around attendance, but due to different contexts have limited comparability with this study.

The data used by Enderby and Davies (1989), which included many, but not all types of disorders, indicated that the children who received regular therapy, attended once a week for an average of 16 weeks. This points to contextual reality as their findings differed significantly from the findings in this study. Roulstone et al. (2004) found of the 71 children allocated to Speech Therapy in their study, 68 attended sessions offered, although nearly 18 % of appointments were cancelled (by the therapist or clinician) or not attended.

4.4. Summary of Chapter 4

This chapter has discussed important trends from the results, provided tentative explanations where possible and compared these results to those from other studies. Robust trends around diagnoses, referral sources, age, gender and language, as well as attendance information were discussed.

Chapter 5

Conclusions, Implications and Critical Evaluation of the Study

5.1. Introduction

This chapter presents the conclusions of the study and thereafter discusses clinical implications of the study. This is followed by a critical evaluation of the study, where limitations of the research are documented. Finally, suggestions for future research are presented.

5.2. Conclusions

This study examined diagnostic, demographic and attendance variables of a sample of clients who attended the Speech Therapy and Audiology OPD of a tertiary hospital in the Western Cape between January 1999 and December 2003. This study was conducted using a longitudinal, retrolective, descriptive study design and reviewed hospital records. It was found that the highest percentages of subjects attended for a hearing loss or voice disorder and that the ENT department at the study hospital and the education sector referred the highest percentages of subjects. In terms of age the highest percentage of subjects were between 7 and 12 years old. Overall there were similar percentages of male and female subjects. English speaking subjects predominated, followed by Afrikaans speaking subjects. Only a small percentage of subjects were Xhosa speaking. Patterns of attendance showed that almost half of all the subjects attended only one appointment. In total just over 70 % of subjects attended either no more than two appointments or attended within a three month period.

These trends were then discussed within the context of the type of service provided and the bigger context of healthcare in South Africa. Results were also discussed in relation to other similar studies.

There are several important implications from the results of this study which need to be highlighted. These and the limitations of this research will now be discussed.

5.3. Implications of the Study

Several important considerations need to be made from the results and discussion of this study. These include issues of record keeping, the lack of public sector Speech Therapy and Audiology services in general, but more specifically the lack of these services in the education sector, and the need to adapt the services provided. These adaptations include issues around providing services in a client's home language and those of attendance. Each of these issues will now be discussed further.

Record Keeping

The first issue that needs to be addressed is that of record keeping. Good record keeping is essential for planning of healthcare services (Rhoda, 2001). Due to large amounts of missing data, certain subjects had to be excluded or sections of their data had to be excluded. Inadequate records can distort research results, prevent clients from being involved in research and negate the quality of research (Farmer, 1990). In addition, the quality of the service provided to a client may be affected if information is missing. Services may be duplicated and clients may be treated inappropriately without access to their records. Therefore methods of recording client information and treatments used need to be reviewed (Farmer, 1990). It needs to be ensured that demographic data is recorded accurately and completely by the administrative staff and that all assessment and treatment notes are placed in the folder, along with a record of the number of sessions attended, cancelled and failed (DNA), as well as discharge information. This information is not only useful for research, but also when assessing cost-efficiency of a service (Rhoda, 2001).

Revision of Service Delivery Model

The second issue is that of provision of Speech Therapy and Audiology services. Within the Western Cape, Speech-Language and Audiology services are provided mainly at a tertiary level. This limits access for the majority of the population and was reflected in the poor

attendance rates. Services need to be provided in line with the Primary Health Care Approach within the District Health System. The results of a study by Rhoda (2001) also indicate the need for Speech Therapy services at a primary level of care and strongly urged that Speech Therapists should be employed at this level.

Considering the poor attendance rates and the high number of 7-12 year olds seen, there is a definite need for more adequate service provision in schools. Education in the Western Cape has very limited Speech Therapy and Audiology services. From contact with a Speech Therapist in the Education department (F. Lewis, personal communication, February 18, 2005) Speech Therapy and Audiology services in the education sector are only available within special schools. In the Western Cape there are 127 health therapists employed in the education sector of the public service, and although the system does not specify how many are Speech Therapists and Audiologists, it was reckoned that there were about 30 to 40 Speech Therapists and Audiologists (F. Lewis, personal communication, February 18, 2005). Education White Paper 6, Building an Inclusive Education and Training System (Department of Education, 2001), mentions the need for optimizing the expertise of specialist support personnel, such as therapists, psychologists, remedial educators and health professionals. There will be a pool of posts kept for specialists with appropriate expertise and experience. Posts will therefore be utilized for the deployment of resource persons that can provide direct interventionist programmes to learners in a range of settings, and/or serve as consultants to school management teams, classroom educators and school governing bodies. What is being proposed is not an increase in staffing, but a more cost-effective use of specialist educators. However, in reality the education sector does not have the capacity for individual therapy with learners in mainstream schools, but plans to provide preventative services and to provide services to educators (F. Lewis, personal communication, February 18, 2005).

One of the major challenges facing the Speech Therapy and Audiology profession is that of language diversity and the lack of Xhosa speaking therapists in the Western Cape. The ideal situation would be to employ professionals speaking the indigenous languages in the area. However, the reality is that often there are not many trained professionals who speak the languages, for various reasons. These include limited access to higher education for members of all language groups (Swartz, 1998). There need to be more Xhosa speaking therapists trained and employed. For this to happen, however, a well thought out policy on languages and professional practice needs to be devised. Despite the fact that there are few Xhosa speaking therapists, services should still be available to this population, even if this is

conducted via interpreters. However, there are no available interpreters, in spite of repeated requests to the hospital authorities in this regard. It is difficult in light of these facts to adapt and provide a service which is equitable to all. According to policy Speech Therapy and Audiology services have to provide an equitable service to Black African first language speaking clients (Pillay, Kathard and Samuel, 1997), although this currently does not seem to be the situation.

The last issue to be discussed is that of attendance. Already changes have been taking place within the Speech Therapy and Audiology OPD at the study hospital. These include the use of group therapy, contracts regarding expectations of the clients and the therapists, and having short blocks of therapy sessions, as well as parent and teacher training programmes. The services provided will need constant revision and adaptation. However, further changes will need to be considered due to the nature of the findings of this study, which confirm what the researcher expected regarding attendance. Ideally, the services should be situated within the community as community based rehabilitation. Failing this communities should be targeted via community outreach programmes. This option is, however, limited by hospital policy. Additionally there may need to be a move to greater use of home programmes and parent and teacher groups, which have already commenced in certain spheres, for example with fluency disorders. Therapists may also need to alter the ideals of how therapy should be conducted to what is realistically possible within these ideals.

5.4. Critical Evaluation: Limitations of this study

There are several limitations to this study, which will be discussed below.

- Little research exists within the Speech Therapy and Audiology profession examining similar data to that in the present study. This resulted in the researcher having to consult literature from other healthcare disciplines, which may not be the most applicable to a Speech Therapy and Audiology context.

- Another limitation resulted from the fact that a sample had to be used, rather than studying the entire population. However, a large sample was chosen to ensure a high degree of validity of results.

- Due to the nature of the study, records were used which were not devised specifically for research purposes. Therefore there were errors and discrepancies in the records as well as missing data. There were no standard definitions (of diseases and demographic or other variables) used and methods in which the information in the folders was recorded were unstandardized and may have been understood in different ways by different professionals. The records may not have been maintained with the care that would be expected in a planned investigation. One difficulty with studying the epidemiology of communication disorders is that many disorders (for example learning difficulties) are not clearly defined (Lubker, 1997). This may affect the categories of medical and speech and language/audiology diagnoses as used in this study. For the purposes of this study the terms used by the professionals who saw the subjects were maintained, but similar names of disorders were grouped together. Despite these difficulties, routine records that include fairly well-recorded information of reasonable quality can be useful as a basis for investigations. Nevertheless, "while it is true that epidemiologists must operate in a world of imperfect information, they should not be paralyzed by this lack of knowledge; rather they must become as aware as possible of the nature and extent of these imperfections" (Cohen, Pokras, Meads and Krushat, 1987, in Abramson, 1990: 199).

- It is realized that this study reports on the profiles of one Speech Therapy and Audiology Department based in a tertiary hospital within the public sector in the Western Cape and that it is impossible to generalize the findings to other services, although findings from this study may be useful for public sector planning.

- Due to the descriptive nature of the study, no causal or correlational assertions could be drawn (Hite, 2001).

- Limitations in the interpretation of the results include lack of comparison data from other sites, limited ability to generalize the findings of this research to other services and the fact that much of the interpretation was speculative in nature.

5.5. Future Research

During the course of this study, several areas which require further research were identified. These are outlined below and include:

- Investigating similar variables as used in this study in a different setting to determine similarities and differences between settings.
- Examining reasons for non-attendance, variables affecting attendance and variables that improve attendance rates.
- Documenting the implementation of various measures to determine whether they improve attendance rates.
- Comparison of profiles of clients attending Speech Therapy and Audiology services at tertiary, secondary and primary sites (where these are available in other provinces).
- Comparisons of trends in service provision across provinces in South Africa.
- Prevalence studies of speech, language or hearing disorders in communities within the Western Cape.

5.6. Summary of Chapter 5

This chapter has presented the conclusions of the study, as well as discussed implications. These implications revolved around issues of record keeping and service delivery. Limitations of the study and ideas for further research were presented.

Glossary

Audiologist: "Audiologists are health care and education professionals who identify, assess, and manage disorders of auditory, balance, and other neural systems. Audiologists provide audiological (aural) rehabilitation to children and adults across the entire life span. Audiologists select, fit, and dispense amplification systems such as hearing aids and related devices. Audiologists prevent hearing loss through the provision and fitting of hearing protective devices, consultation on the effects of noise on hearing, and consumer education. Audiologists are involved in auditory and related research pertinent to the prevention, identification, and management of hearing loss, tinnitus, and balance system dysfunction. Audiologists serve as expert witnesses in litigation related to their areas of expertise" (ASHA, 1997-2005).

Audiology: "Audiology is the study of hearing, hearing disorders, and habilitation/rehabilitation for individuals who have hearing loss. It encompasses the study of how the hearing mechanism works; the assessment of hearing; hearing and listening disorders; and the rehabilitation of individuals who have hearing loss" (ASHA, 1997-2005).

Client: For the purpose of this study a client was anybody who attended the Speech Therapy and Audiology Department as an out-patient.

District Health System: "The DHS is an organisational framework for a country's health care system. It is accepted worldwide as the most appropriate vehicle for the delivery of the Primary Health Care Approach. The characteristics of the DHS are:-

- A number of discrete geographical sub-divisions, usually called "health districts", each with a clearly defined catchment population
- Clear guidelines being used for demarcation of the "health districts" such as
    - each to include a level 1hospital
    - population not to exceed 500 000
    - geographical size not to be such that the furthest clinic can be reached in approximately 3 hours from the district office
    - being of a reasonable size so as to ensure effective management
- Each "health district" has a decentralised health management team responsible for

- delivery of a comprehensive and integrated package of health care to the population
- planning, managing, implementing and monitoring health care delivery that is appropriate for the population
- ensuring equitable and cost effective use of resources
- establishing an appropriate referral system between parts of the district health system and with relevant services outside the 'health district'" (Hall, Haynes and McCoy, 2002: 1).

Primary Health Care Approach: "The PHC Approach is a *philosophy* and a conceptual model for an ideal health system. It formed the basis of the 1978 Declaration of Alma-Ata which promotes *essential health care* based on *practical, scientifically sound* and *socially acceptable* methods and technology, made *universally accessible* and *equitable* at a cost that is *affordable*, with *community participation.* It includes social upliftment of the community as a whole through, amongst other things, the provision of clean water, household food security, a clean and safe physical environment and mental well-being. The PHC Approach is more that the provision of "primary level services" that are typically provided in clinics and mobile services. It envisages a seamless referral system from the community all the way to the most sophisticated health care available" (Hall, Haynes and McCoy, 2002: 1).

Rehabilitation: This is the word used to describe the ways of helping people with disabilities to become fully participating members of society, with access to all the benefits and opportunities of that society (Office of the Deputy President, 1997: 26).

Rehabilitation Centres: For this study these included Conradie Hospital, Conradie Care Centre/Westlake/Lifecare and Booth Memorial Hospital.

Special schools/Specialized schools: These are schools that provide educational services to learners with special educational needs.

Speech and language disorders: "Speech and language disorders are inabilities of individuals to understand and/or appropriately use the speech and language systems of society. Such disorders may range from simple sound repetitions or occasional misarticulations to the complete absence of the ability to use speech and language for communication" (ASHA, 1997-2005).

Speech Therapists: "The professionals who are educated to assess speech and language development and to treat language and speech disorders are speech-language pathologists (sometimes informally referred to as speech therapists). Speech-language pathologists can also help people with swallowing disorders" (ASHA, 1997-2005).

Study Hospital: The study hospital is the tertiary hospital in which this research was conducted.

Abbreviations used:

BCH = Brooklyn Chest Hospital

CT = Cape Town

ENT = Ear, Nose and Throat

LD = Learning Difficulty/Learning Disability

OAH = Old Age Home

OPD = outpatient department

Disorders as used in the present study:

Dysphagia: For the purpose of this study any swallowing difficulties.

Fluency: For the purpose of this study any form of dysfluency, most often stuttering.

Hearing Loss/Tinnitus (sometimes referred to as hearing loss): For the purpose of this study any client who had any degree of hearing loss or tinnitus.

Language: For the purpose of this study any child with language difficulties.

Learning Difficulties: For the purpose of this study learning difficulties included children who had phonological awareness, auditory processing, reading or writing difficulties.

Multiple difficulties (Paediatrics): This category included children who had more than one of the following: language or language and learning difficulties, phonology/articulation/oral motor, stuttering, hearing loss.

Neurological Communication Disorders: For the purpose of this study this included aphasia, dysarthria and speech apraxia.

Phonology/Articulation/Oral motor: For the purpose of this study this included any phonology or articulation difficulties or oral motor difficulties (not dysarthria).

Voice disorder: For the purposes of this study any client who presented with any form of voice or phonatory disorder or vocal pathology, including laryngectomy.

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Appendix A

Data Collection Form

Demographic Information – Date in file____________________

Folder number: ______________________________

Client's Name: ______________________________ Gender: Male Female

Date of Birth: ____________________ Home language: __________________

Full Residential Address: ____

____

Monthly Family Income: ____________________ No of dependants: ______________

Hospital category: Free H0 H1 H2 H3 Private

Marital Status: Single Widowed Married Divorced Not Given NA

Occupation: Pensioner Grant Other:______________________________

Diagnostic information

Medical Diagnosis: ____

Speech/Audio Diagnosis: ____

Referral source: ____

Date assessed: ______________

Attendance information (write every date)

Dates attended therapy sessions:

Dates cancelled therapy sessions:

Dates of appointments missed:

Appendix B

Coding System used for Data

Age

1	0-6
2	7-12
3	13-18
4	19-29
5	30-39
6	40-49
7	50-59
8	60-69
9	70-79
10	80+

Gender

1	Male
2	Female
3	Missing

Home Language

1	English
2	Afrikaans
3	Xhosa
4	Other
5	Missing

Marital Status

1	Married
2	Single
3	Divorced
4	Widowed
5	Children
6	Missing

Occupation

1	Pensioner
2	Unemployed
3	Grant
4	Employed
5	Children or Students
6	Missing

Geographical location

1	Central
2	Eastern
3	Khayalitsha
4	Klipfontein
5	Mitchells Plain
6	Northern Panrama
7	Southern
8	Tygerberg
9	Outside City of Cape Town
10	Missing

Medical Diagnosis:

1	CVA
2	Head injury
3	Hearing loss/Auditory pathology
4	Phonatory disorder/laryngeal pathology
5	Cerebral Palsy
6	Cleft Palate
7	Head and Neck Cancer/Surgery/Trauma
8	Neurological condition other than CVA
9	Laryngectomy
10	None given
12	Missing
13	Other

Speech/Audiology Diagnosis

1	Hearing loss/tinnitus
2	Voice
3	Aphasia, apraxia and dysarthria
4	Dysphagia
5	Dysphagia and neuro comm disorder
6	Stuttering/fluency/normal disfl
7	Artic/phonology/oral motor
8	Language
9	Language and LD
10	Multiple speech/language /hearing problems
11	None
12	Missing
14	Voice and dysphagia
15	Other
16	Undiagnosed

Referral sources

1	GSH ENT/Outpatient Audiology
2	GSH Wards
3	GSH Other
4	Other tertiary institutions in CT
5	Hospitals in CT (excl tertiary)
6	CHC/Day Hosp/Primary Health in CT
7	Workplace/Occupational Health
8	Education
10	OAH/Senior Centre/Residential Care
11	Self/Family/Friend
12	Other
13	Outside of CT
14	Audio at Brooklyn Chest Hospital
15	Rehabilitation Centres (Conradie, Conradie Care Centre, Booth Memorial Hospital)
16	Missing or incomplete information
17	Private health professional

Number of Appointments Attended/DNA

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10-19	10
20-29	11
30+	12

Time Period

1 Appointment booked	0
0-3 months	1
3-6 months	2
6-9 months	3
9-12 months	4
12-15 months	5
15-18 months	6
18-21 months	7
21-24 months	8
24 + months	9
Missing	10

Appendix C

Example of Information and Coding (based on a fictional subject)

The codes are given in red.

Demographic Information – Date in file 1999

Folder number: 00000000

Client's Name: Michelle Brown Gender: Male Female (2)

Date of Birth: 01/01/1935 (8) Home language: English (1)

Full Residential Address: 3 Dandelion Crescent, Maitland, 7405 (1)

Monthly Family Income: R 500.00 No of dependants: 4

Hospital category: Free H0 H1 H2 H3 Private

Marital Status: Single Widowed Married Divorced Not Given NA (1)

Occupation: Pensioner Grant Other: Casual (4)

Diagnostic information

Medical Diagnosis: CVA (1)

Speech/Audio Diagnosis: Aphasia and Apraxia (3)

Referral source: Dr at Maitland CHC (6)

Date assessed: 04/02/2000

Attendance information (write every date)

Attended: 4
DNA: 3
% Attended: 57%
Time frame: 0-3 months = 1

Dates attended therapy sessions: (3+1=4) (4)

04/03/2000 01/04/2000
18/03/2000

Dates cancelled therapy sessions:

25/03/2000

Dates of appointments missed: (2+1=3) (3)

8/04/2000
22/04/2000

Appendix D

Results: Additional Tables and Graphs

Table D.1.
Number and Percentage of Subjects per Speech-Language and Audiology Diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
Hearing Loss/Tinnitus	250	29.1
Voice	180	21.0
Neuro Communication	111	12.9
Dysphagia	15	1.7
Dysphagia and Neuro Communication	37	4.3
Fluency	71	8.3
Phonology/Articulation/Oral Motor	23	2.7
Language	23	2.7
Language and Learning Disability	30	3.5
Multiple Difficulties (Paediatrics)	56	6.5
None	43	5.0
Missing	10	1.2
Voice and Dysphagia	4	.5
Other	4	.5
Undiagnosed	2	.2
Total	859	100.0

Table D.2.
Percentage of Subjects per Speech-Language and Audiology Diagnosis who attended the Speech Therapy and Audiology OPD within each year

	Year					5 Year Period Total
	1999 (n=182)	2000 (n=164)	2001 (n=1710	2002 (n=171)	2003 (n=171)	(n=859)
Hearing Loss/Tinnitus	30.8%	28.7%	35.7%	22.8%	27.5%	29.1%
Voice	20.3%	24.4%	19.9%	21.6%	18.7%	21.0%
Neuro Communication	9.9%	17.1%	12.9%	14.6%	10.5%	12.9%
Dysphagia	.5%	1.2%	2.9%	3.5%	.6%	1.7%
Dysphagia and Neuro Communication	3.8%	4.9%	5.3%	3.5%	4.1%	4.3%
Fluency	7.1%	4.9%	8.8%	8.8%	11.7%	8.3%
Phonology/Articulation/ Oral Motor	6.0%		1.8%	2.3%	2.9%	2.7%
Language	3.8%	1.2%	1.8%	2.3%	4.1%	2.7%
Language and Learning Disability	2.2%	4.3%	1.8%	5.3%	4.1%	3.5%
Multiple Difficulties (Paediatrics)	6.0%	4.9%	3.5%	8.8%	9.4%	6.5%
None	6.6%	6.7%	3.5%	4.7%	3.5%	5.0%
Missing	2.2%	.6%	1.2%	.6%	1.2%	1.2%
Voice and Dysphagia		.6%	.6%	.6%	.6%	.5%
Other		.6%		.6%	1.2%	.5%
Undiagnosed	.5%		.6%			.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

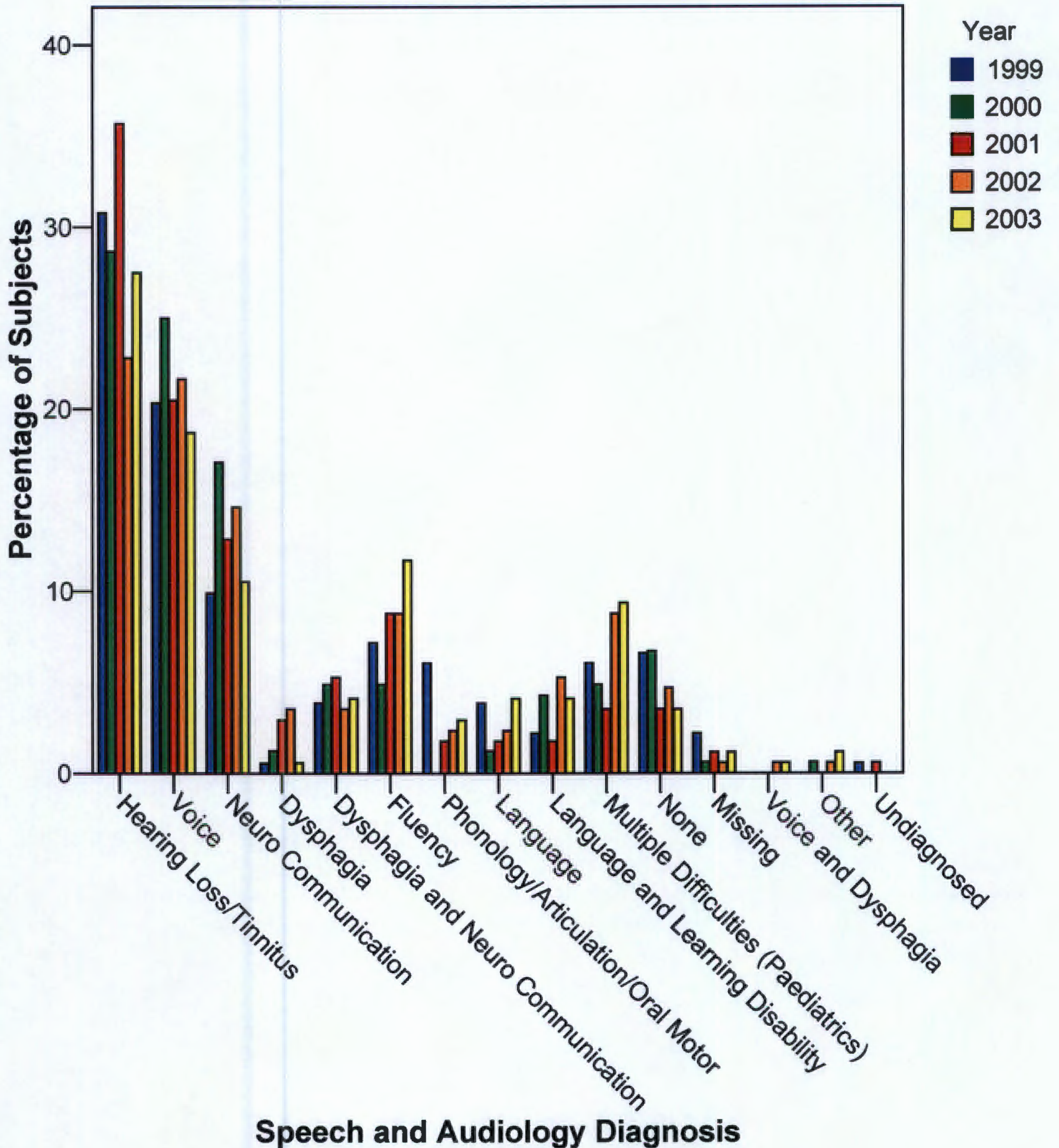

Figure D.1.
Percentage of Subjects per Speech-Language and Audiology Diagnosis who attended the Speech Therapy and Audiology OPD within each year

Table D.3.
Number and Percentage of Subjects per Medical Diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
CVA	136	15.8
Head Injury	24	2.8
Auditory	255	29.7
Phonatory disorder	177	20.6
Cerebral Palsy	3	.3
Cleft Palate	8	.9
Head and Neck	8	.9
Neurological disorder	17	2.0
Laryngectomy	1	.1
None given	221	25.7
Other	9	1.0
Total	859	100.0

Table D.4.
Percentage of Subjects per Medical Diagnosis who attended the Speech Therapy and Audiology OPD within each year

	Year					5 Year Period Total
	1999 (n=182)	2000 (n=164)	2001 (n=1710	2002 (n=171)	2003 (n=171)	(n=859)
CVA	11.5%	19.5%	16.4%	15.2%	17.0%	15.8%
Head Injury	3.3%	4.3%	2.9%	2.9%	.6%	2.8%
Auditory	30.8%	28.7%	35.7%	24.0%	29.2%	29.7%
Phonatory disorder	19.8%	22.6%	19.3%	22.8%	18.7%	20.6%
Cerebral Palsy	1.1%			.6%		.3%
Cleft Palate	1.1%	1.2%	.6%	.6%	1.2%	.9%
Head and Neck	.5%	1.8%	.6%	1.8%		.9%
Neurological disorder	1.6%	2.4%	2.3%	2.9%	.6%	2.0%
Laryngectomy					.6%	.1%
None given	28.0%	19.5%	20.5%	28.1%	32.2%	25.7%
Other	2.2%		1.8%	1.2%		1.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

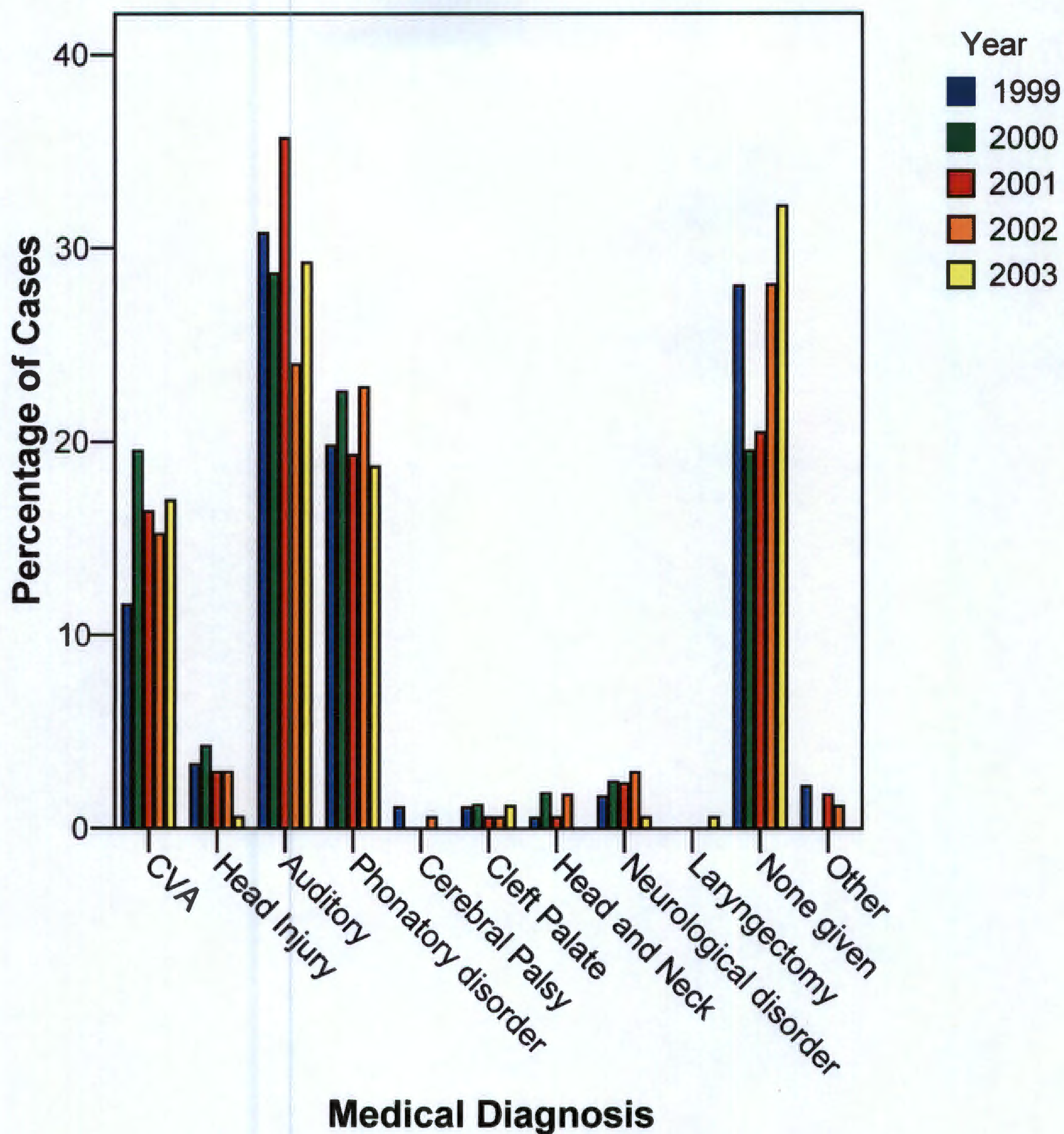

Figure D.2.
Percentage of Subjects per Medical Diagnosis who attended the Speech Therapy and Audiology OPD within each year

Table D.5.
Number and Percentage of Subjects per Referral Source who attended the Speech Therapy and Audiology OPD from 1999-2003

	Frequency	Percent
ENT/Audiology at Study Hospital	203	23.6
Wards at Study Hospital	32	3.7
Other at Study Hospital	58	6.8
Other Tertiary Hospitals in CT	16	1.9
Hospitals in CT (not tertiary)	52	6.1
Community Clinics	82	9.5
Occupational Health	41	4.8
Education	111	12.9
OAH/Residential Care	12	1.4
Self	70	8.1
Other	13	1.5
Outside of CT	4	.5
Audio at BCH	8	.9
Rehabilitation Centres	31	3.6
Missing	92	10.7
Private Sector	34	4.0
Total	859	100.0

Table D.6.
Percentage of Subjects per Referral Source who attended the Speech Therapy and Audiology OPD within each year

	Year					5 Year Period Total
	1999 (n=182)	2000 (n=164)	2001 (n=1710	2002 (n=171)	2003 (n=171)	(n=859)
ENT/Audiology at Study Hospital	25.3%	26.2%	25.1%	19.9%	21.6%	23.6%
Wards at Study Hospital	1.6%	4.9%	4.1%	4.7%	3.5%	3.7%
Other at Study Hospital	7.1%	7.3%	5.3%	8.8%	5.3%	6.8%
Other Tertiary Hospitals in CT	1.1%	1.2%	1.2%	1.2%	4.7%	1.9%
Hospitals in CT (not tertiary)	6.6%	6.7%	4.1%	5.3%	7.6%	6.1%
Community Clinics	4.4%	10.4%	11.7%	11.7%	9.9%	9.5%
Occupational Health	7.1%	2.4%	5.8%	4.1%	4.1%	4.8%
Education	19.2%	9.8%	7.6%	12.9%	14.6%	12.9%
OAH/Residential Care	1.1%	1.8%	1.8%	1.2%	1.2%	1.4%
Self	7.1%	9.8%	8.2%	9.9%	5.8%	8.1%
Other	1.1%	1.8%	3.5%	.6%	.6%	1.5%
Outside of CT	1.1%			1.2%		.5%
Audio at BCH		.6%	.6%	1.2%	2.3%	.9%
Rehabilitation Centres	4.4%	7.3%	2.3%	2.3%	1.8%	3.6%
Missing	7.7%	5.5%	12.9%	12.9%	14.6%	10.7%
Private Sector	4.9%	4.3%	5.8%	2.3%	2.3%	4.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

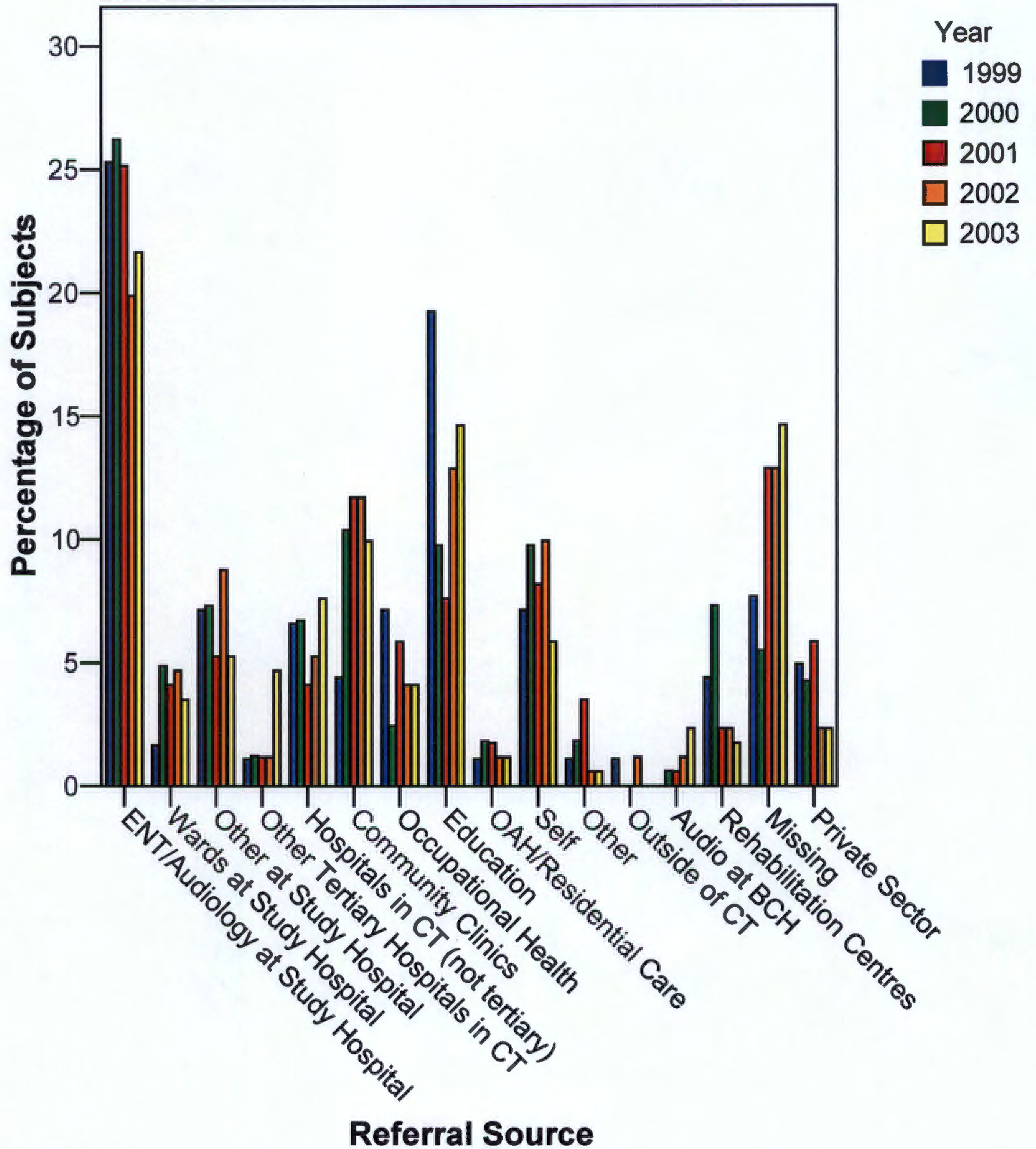

Figure D.3.
Percentage of Subjects who attended the Speech Therapy and Audiology OPD within each year from each Referral Source

Table D.7.
Number and Percentage of Subjects per Age Group who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
0-6 years	69	7.6
7-12 years	165	18.1
13-18 years	39	4.3
19-29 years	79	8.7
30-39 years	118	13.0
40-49 years	115	12.6
50-59 years	107	11.8
60-69 years	101	11.1
70-79 years	87	9.6
80+ years	30	3.3
Total	910	100.0

Table D.8.
Percentage of Subjects per Age Group who attended the Speech Therapy and Audiology OPD within each year

		Year					5 Year Period
		1999 (n=194)	2000 (n=174)	2001 (n=182)	2002 (n=185)	2003 (n=175)	(n=910)
Age Group	0-6 years	8.8%	4.6%	7.7%	8.1%	8.6%	7.6%
	7-12 years	22.2%	14.4%	12.1%	19.5%	22.3%	18.1%
	13-18 years	2.6%	4.0%	5.5%	7.0%	2.3%	4.3%
	19-29 years	11.3%	8.6%	8.2%	8.6%	6.3%	8.7%
	30-39 years	14.4%	13.2%	12.6%	14.6%	9.7%	13.0%
	40-49 years	8.8%	14.4%	14.3%	14.1%	12.0%	12.6%
	50-59 years	12.4%	9.2%	11.5%	12.4%	13.1%	11.8%
	60-69 years	8.8%	16.1%	14.3%	8.1%	8.6%	11.1%
	70-79 years	8.2%	12.1%	8.2%	6.5%	13.1%	9.6%
	80+ years	2.6%	3.4%	5.5%	1.1%	4.0%	3.3%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

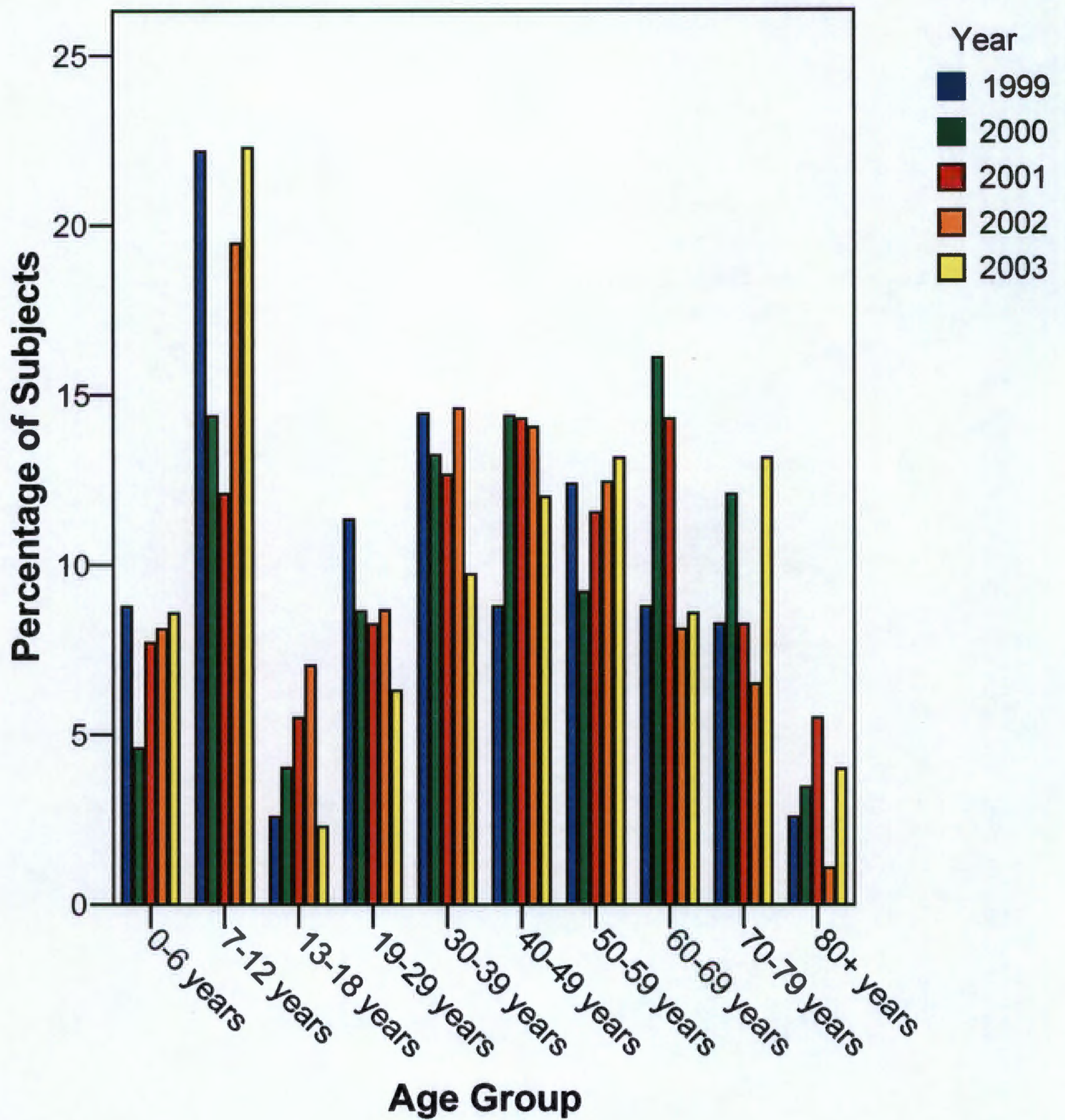

Figure D.4.
Percentage of Subjects per Age Group who attended the Speech Therapy and Audiology OPD within each year

Table D.9.
Number and Percentage of Subjects per Gendercategory who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
Male	470	51.6
Female	439	48.2
Missing	1	.1
Total	910	100.0

Figure D.5.
Percentage of Subjects per Gender category who attended the Speech Therapy and Audiology OPD from 1999-2003

Table D.10.
Percentage of Subjects per Gender category who attended the Speech Therapy and Audiology OPD within each year

		Year					5 Year Period Total (n=910)
		1999 (n=194)	2000 (n=174)	2001 (n=182)	2002 (n=185)	2003 (n=175)	
Gender	Male	55.2%	43.1%	52.7%	53.0%	53.7%	51.6%
	Female	44.8%	56.9%	47.3%	46.5%	46.3%	48.2%
	Missing				.5%		.1%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table D.11.
Percentage of Subjects of each Gender and Speech-Language and Audiology Diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003

		Sex		Total
		Male	Female	
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagnosis	54.0%	46.0%	100.0%
	% within Sex	31.0%	27.2%	29.1%
Voice (n=180)	% within Speech and Audiology Diagnosis	21.4%	78.6%	100.0%
	% within Sex	8.9%	33.8%	21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagnosis	56.8%	43.2%	100.0%
	% within Sex	14.4%	11.3%	12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagnosis	60.0%	40.0%	100.0%
	% within Sex	2.1%	1.4%	1.7%
Dysphagia and Neuro Communication (n=37)	% within Speech and Audiology Diagnosis	56.8%	43.2%	100.0%
	% within Sex	4.8%	3.8%	4.3%
Fluency (n=71)	% within Speech and Audiology Diagnosis	69.0%	31.0%	100.0%
	% within Sex	11.2%	5.2%	8.3%
Phonology/Articulation/ Oral Motor (n=23)	% within Speech and Audiology Diagnosis	73.9%	26.1%	100.0%
	% within Sex	3.9%	1.4%	2.7%
Language (n=23)	% within Speech and Audiology Diagnosis	43.5%	56.5%	100.0%
	% within Sex	2.3%	3.1%	2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagnosis	80.0%	20.0%	100.0%
	% within Sex	5.5%	1.4%	3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagnosis	71.4%	28.6%	100.0%
	% within Sex	9.2%	3.8%	6.5%
None (n=43)	% within Speech and Audiology Diagnosis	41.9%	58.1%	100.0%
	% within Sex	4.1%	5.9%	5.0%
Missing (n=10)	% within Speech and Audiology Diagnosis	60.0%	40.0%	100.0%
	% within Sex	1.4%	.9%	1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagnosis	50.0%	50.0%	100.0%
	% within Sex	.2%	.2%	.2%
Other (n=4)	% within Speech and Audiology Diagnosis	50.0%	50.0%	100.0%
	% within Sex	.5%	.5%	.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagnosis	100.0%		100.0%
	% within Sex	.5%		.2%
Total (n=859)	% within Speech and Audiology Diagnosis	50.8%	49.2%	100.0%
	% within Sex	100.0%	100.0%	100.0%

Table D.12.
Number and Percentage of Subjects per Language group who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
English	501	55.1
Afrikaans	298	32.7
Xhosa	82	9.0
Other	18	2.0
Missing	11	1.2
Total	910	100.0

Table D.13.
Percentage of Subjects per Language group who attended the Speech Therapy and Audiology OPD within each year

	Year					5 Year Period Total (n=910)
	1999 (n=194)	2000 (n=174)	2001 (n=182)	2002 (n=185)	2003 (n=175)	
English	53.6%	56.3%	57.7%	53.0%	54.9%	55.1%
Afrikaans	33.0%	37.9%	30.8%	30.3%	32.0%	32.7%
Xhosa	8.8%	4.6%	7.7%	13.0%	10.9%	9.0%
Other	3.1%	1.1%	3.3%	1.6%	.6%	2.0%
Missing	1.5%		.5%	2.2%	1.7%	1.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

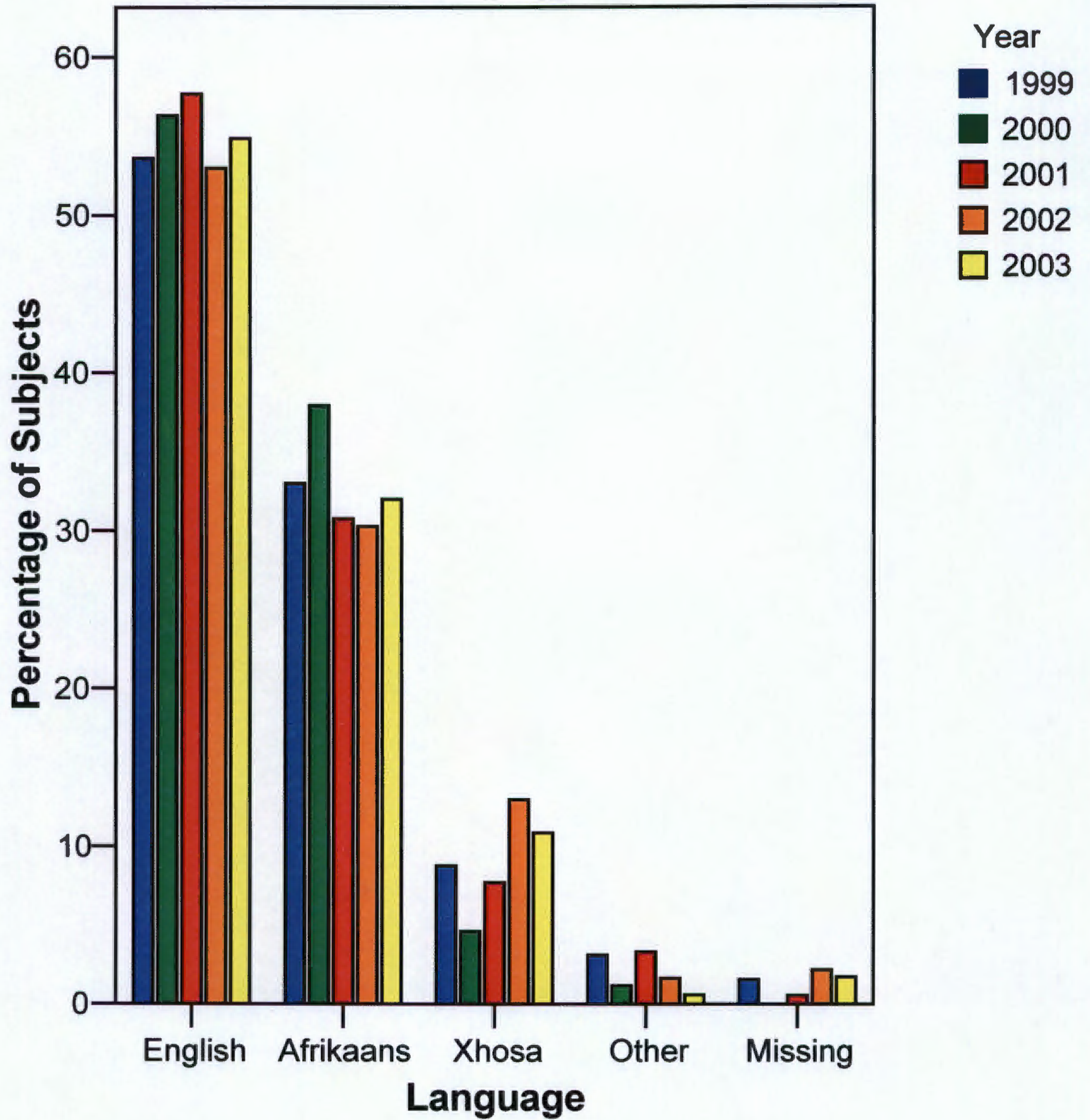

Figure D.6.
Percentage of Subjects per Language group who attended the Speech Therapy and Audiology OPD within each year

Table D.14.

Percentage of Subjects per Language group and Speech-Language and Audiology Diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003

		Language					
		English	Afrikaans	Xhosa	Other	Missing	Total
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagnosis	56.4%	28.8%	10.4%	3.6%	.8%	100.0%
	% within Language	29.7%	25.8%	33.3%	50.0%	22.2%	29.1%
Voice (n=180)	% within Speech and Audiology Diagnosis	50.5%	41.2%	5.5%	1.1%	1.6%	100.0%
	% within Language	19.4%	26.9%	12.8%	11.1%	33.3%	21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagnosis	45.9%	32.4%	18.0%	1.8%	1.8%	100.0%
	% within Language	10.7%	12.9%	25.6%	11.1%	22.2%	12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagnosis	53.3%	46.7%				100.0%
	% within Language	1.7%	2.5%				1.7%
Dysphagia and Neuro Communication (n=37)	% within Speech and Audiology Diagnosis	56.8%	32.4%	8.1%		2.7%	100.0%
	% within Language	4.4%	4.3%	3.8%		11.1%	4.3%
Fluency (n=71)	% within Speech and Audiology Diagnosis	57.7%	39.4%	1.4%	1.4%		100.0%
	% within Language	8.6%	10.0%	1.3%	5.6%		8.3%
Phonology/Articulation/Oral Motor (n=23)	% within Speech and Audiology Diagnosis	56.5%	30.4%	8.7%		4.3%	100.0%
	% within Language	2.7%	2.5%	2.6%		11.1%	2.7%
Language (n=23)	% within Speech and Audiology Diagnosis	65.2%	21.7%	8.7%	4.3%		100.0%
	% within Language	3.2%	1.8%	2.6%	5.6%		2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagnosis	73.3%	20.0%	6.7%			100.0%
	% within Language	4.6%	2.2%	2.6%			3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagnosis	60.7%	28.6%	10.7%			100.0%
	% within Language	7.2%	5.7%	7.7%			6.5%
None (n=43)	% within Speech and Audiology Diagnosis	60.5%	30.2%	7.0%	2.3%		100.0%
	% within Language	5.5%	4.7%	3.8%	5.6%		5.0%
Missing (n=10)	% within Speech and Audiology Diagnosis	70.0%	10.0%		20.0%		100.0%
	% within Language	1.5%	.4%		11.1%		1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagnosis	50.0%	50.0%				100.0%
	% within Language	.2%	.4%				.2%
Other (n=4)	% within Speech and Audiology Diagnosis	50.0%		50.0%			100.0%
	% within Language	.4%		2.6%			.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagnosis	50.0%		50.0%			100.0%
	% within Language	.2%		1.3%			.2%
Total (n=859)	% within Speech and Audiology Diagnosis	55.3%	32.5%	9.1%	2.1%	1.0%	100.0%
	% within Language	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table D.15.
Number and Percentage of Subjects per Occupational category who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
Pensioner	174	19.1
Unemployed	170	18.7
Grant	48	5.3
Employed	220	24.2
Children and Students	283	31.1
Missing	15	1.6
Total	910	100.0

Table D.16.
Percentage of Subjects per Occupational category who attended the Speech Therapy and Audiology OPD within each year

	Year					5 Year Period Total (n=910)
	1999 (n=194)	2000 (n=174)	2001 (n=182)	2002 (n=185)	2003 (n=175)	
Pensioner	13.9%	27.0%	23.1%	8.6%	24.0%	19.1%
Unemployed	19.1%	15.5%	20.3%	21.6%	16.6%	18.7%
Grant	4.1%	5.2%	3.8%	9.2%	4.0%	5.3%
Employed	24.2%	28.2%	24.7%	23.8%	20.0%	24.2%
Children and Students	37.1%	23.6%	25.8%	34.1%	34.3%	31.1%
Missing	1.5%	.6%	2.2%	2.7%	1.1%	1.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

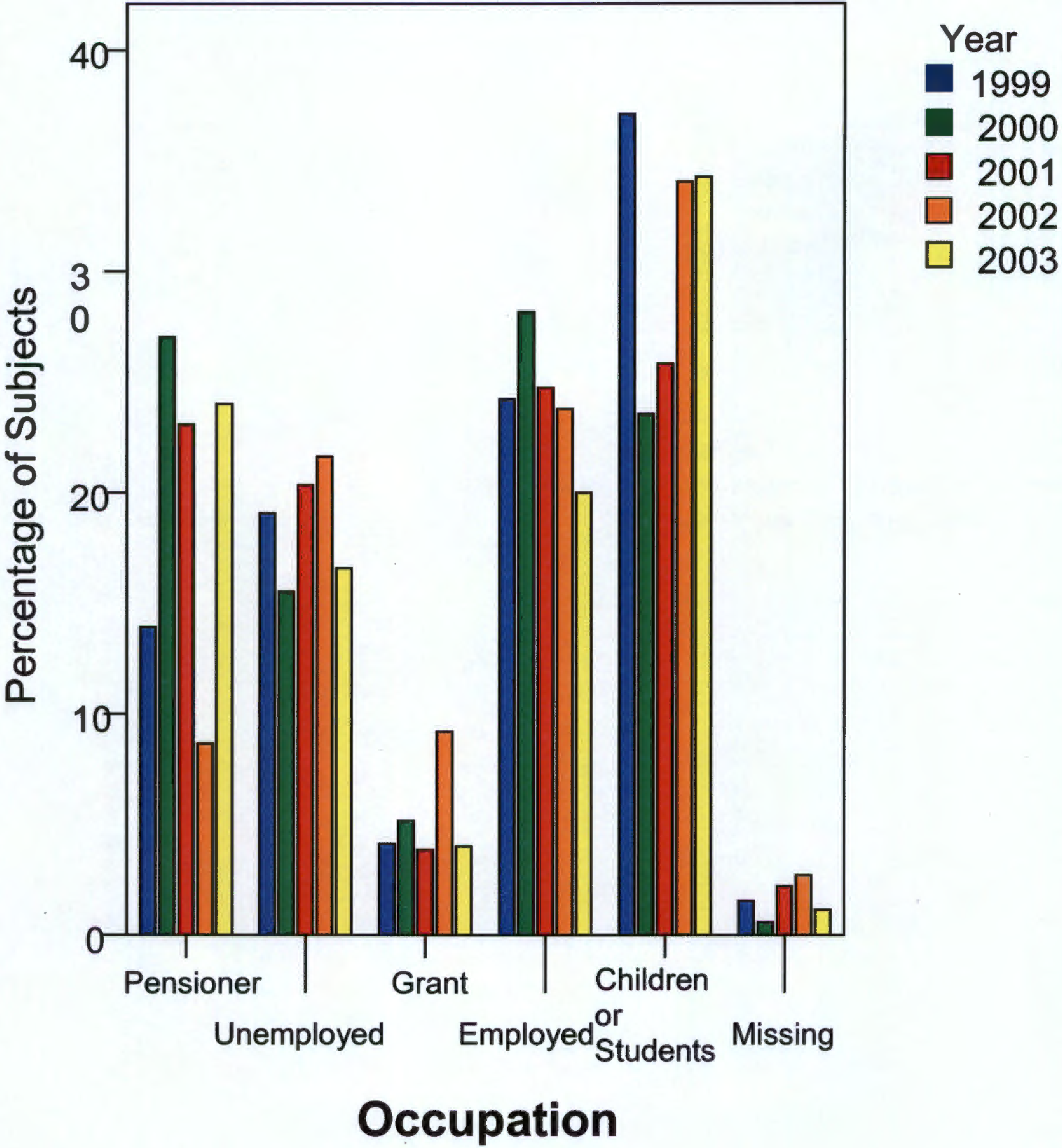

Figure D.7.
Percentage of Subjects per Occupational category who attended the Speech Therapy and Audiology OPD within each year

Table D.17.
Number and Percentage of Subjects per Marital status category who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
Married	319	35.1
Single	153	16.8
Divorced	46	5.1
Widowed	87	9.6
Not applicable	273	30.0
Missing	32	3.5
Total	910	100.0

Table D.18.
Percentage of Subjects per Marital Status category who attended the Speech Therapy and Audiology OPD within each year

	Year					5 Year Period Total
	1999 (n=194)	2000 (n=174)	2001 (n=182)	2002 (n=185)	2003 (n=175)	(n=910)
Married	34.0%	35.1%	39.0%	32.4%	34.9%	35.1%
Single	19.1%	21.3%	16.5%	14.6%	12.6%	16.8%
Divorced	4.6%	7.5%	5.5%	3.8%	4.0%	5.1%
Widowed	5.7%	10.9%	11.5%	8.6%	11.4%	9.6%
Children	34.5%	23.0%	25.3%	33.5%	33.1%	30.0%
Missing	2.1%	2.3%	2.2%	7.0%	4.0%	3.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

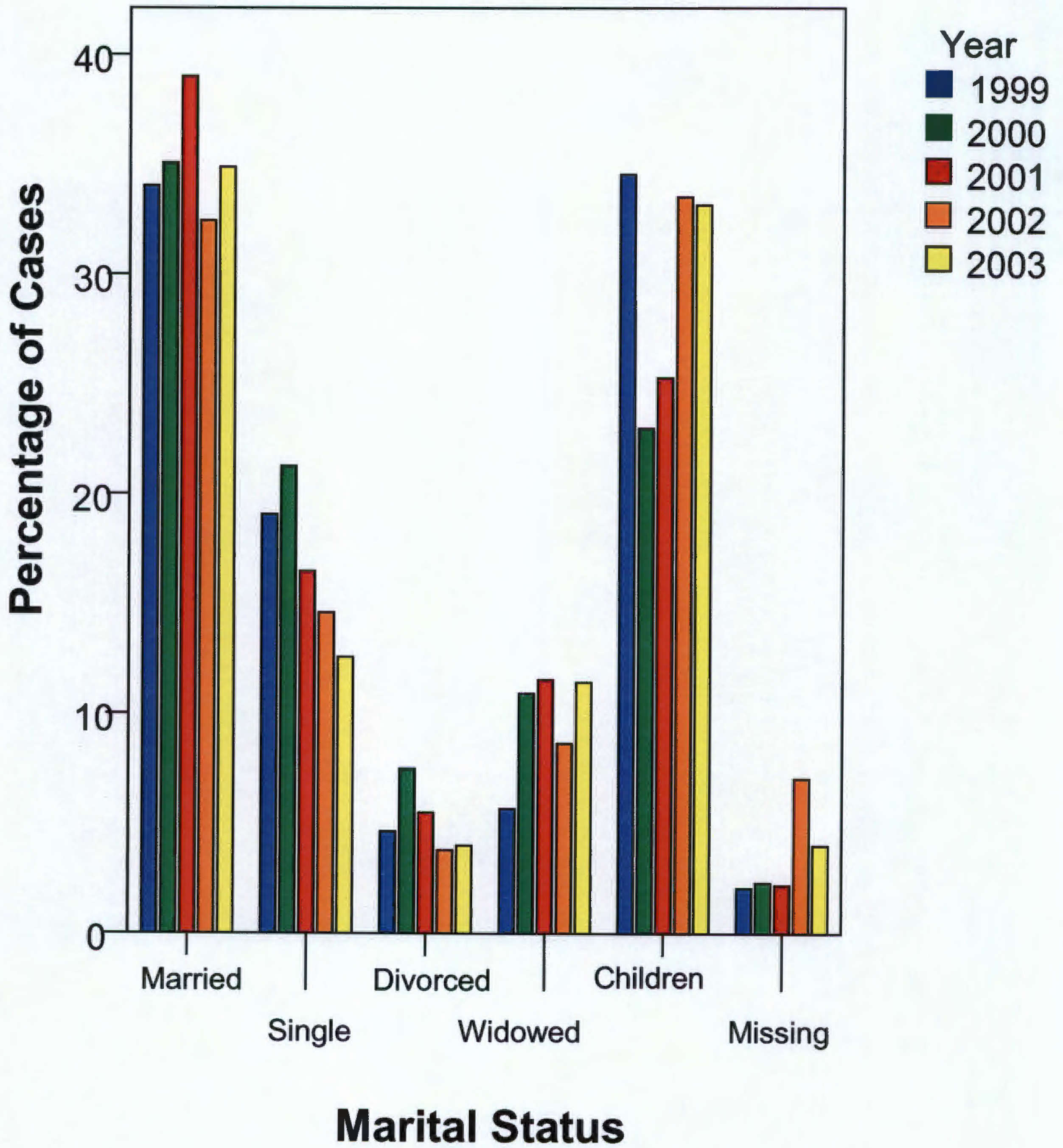

Figure D.8.
Percentage of Subjects per Marital Status category who attended the Speech Therapy and Audiology OPD within each year

Table D.19.

Percentage of Subjects per Marital Status category and Speech-Language and Audiology Diagnosis who attended the Speech Therapy and Audiology OPD from 1999-2003

		Marital Status						
		Married	Single	Divorced	Widowed	Not applicable	Missing	Total
Hearing Loss/Tinnitus (n=250)	% within Speech and Audiology Diagnosis	37.6%	21.2%	6.4%	18.8%	11.2%	4.8%	100.0%
	% within Marital Status	30.9%	37.9%	35.6%	54.0%	11.1%	40.0%	29.1%
Voice (n=180)	% within Speech and Audiology Diagnosis	54.4%	25.3%	8.2%	7.7%	1.1%	3.3%	100.0%
	% within Marital Status	32.6%	32.9%	33.3%	16.1%	.8%	20.0%	21.2%
Neuro Communication (n= 111)	% within Speech and Audiology Diagnosis	50.5%	19.8%	8.1%	13.5%	1.8%	6.3%	100.0%
	% within Marital Status	18.4%	15.7%	20.0%	17.2%	.8%	23.3%	12.9%
Dysphagia (n=15)	% within Speech and Audiology Diagnosis	53.3%	13.3%	13.3%	13.3%	6.7%		100.0%
	% within Marital Status	2.6%	1.4%	4.4%	2.3%	.4%		1.7%
Dysphagia and Neuro Communication (n=37)	% within Speech and Audiology Diagnosis	64.9%	10.8%	2.7%	16.2%		5.4%	100.0%
	% within Marital Status	7.9%	2.9%	2.2%	6.9%		6.7%	4.3%
Fluency (n=71)	% within Speech and Audiology Diagnosis	1.4%	8.5%			90.1%		100.0%
	% within Marital Status	.3%	4.3%			25.3%		8.3%
Phonology/Articulation/ Oral Motor (n=23)	% within Speech and Audiology Diagnosis			4.3%		95.7%		100.0%
	% within Marital Status			2.2%		8.7%		2.7%
Language (n=23)	% within Speech and Audiology Diagnosis					100.0%		100.0%
	% within Marital Status					9.1%		2.7%
Language and Learning Disability (n= 30)	% within Speech and Audiology Diagnosis					100.0%		100.0%
	% within Marital Status					11.9%		3.5%
Multiple Difficulties (Paediatrics) (n=56)	% within Speech and Audiology Diagnosis					100.0%		100.0%
	% within Marital Status					22.1%		6.5%
None (n=43)	% within Speech and Audiology Diagnosis	30.2%	7.0%	2.3%	4.7%	51.2%	4.7%	100.0%
	% within Marital Status	4.3%	2.1%	2.2%	2.3%	8.7%	6.7%	5.0%
Missing (n=10)	% within Speech and Audiology Diagnosis	60.0%	20.0%		10.0%		10.0%	100.0%
	% within Marital Status	2.0%	1.4%		1.1%		3.3%	1.2%
Voice and Dysphagia (n=4)	% within Speech and Audiology Diagnosis	50.0%	50.0%					100.0%
	% within Marital Status	.3%	.7%					.2%
Other (n=4)	% within Speech and Audiology Diagnosis	50.0%				50.0%		100.0%
	% within Marital Status	.7%				.8%		.5%
Undiagnosed (n=2)	% within Speech and Audiology Diagnosis		50.0%			50.0%		100.0%
	% within Marital Status		.7%			.4%		.2%
Total (n=859)	% within Speech and Audiology Diagnosis	35.4%	16.3%	5.2%	10.1%	29.5%	3.5%	100.0%
	% within Marital Status	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table D.20.
Number and Percentage of Subjects per Geographical Location who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent
Central	209	23.0
Eastern	22	2.4
Khayelitsha	39	4.3
Klipfontein	258	28.4
Mitchells Plain	117	12.9
Northern Panorama	46	5.1
Southern	150	16.5
Tygerberg	39	4.3
Outside Cape Town	21	2.3
Missing	9	1.0
Total	910	100.0

Table D.21.
Percentage of Subjects per Geographical Location who attended the Speech Therapy and Audiology OPD within each year

	Year					5 Year Period Total
	1999 (n=194)	2000 (n=174)	2001 (n=182)	2002 (n=185)	2003 (n=175)	(n=910)
Central	23.2%	26.4%	26.4%	22.2%	16.6%	23.0%
Eastern	2.6%	1.7%	1.6%	3.2%	2.9%	2.4%
Khayelitsha	5.2%	2.9%	4.4%	5.9%	2.9%	4.3%
Klipfontein	22.2%	35.1%	26.4%	23.8%	35.4%	28.4%
Mitchells Plain	13.4%	8.6%	12.1%	16.2%	13.7%	12.9%
Northern Panorama	6.7%	5.7%	4.4%	2.7%	5.7%	5.1%
Southern	17.0%	11.5%	17.6%	18.4%	17.7%	16.5%
Tygerberg	5.2%	4.6%	3.3%	5.4%	2.9%	4.3%
Outside Cape Town	3.1%	2.9%	2.7%	.5%	2.3%	2.3%
Missing	1.5%	.6%	1.1%	1.6%		1.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

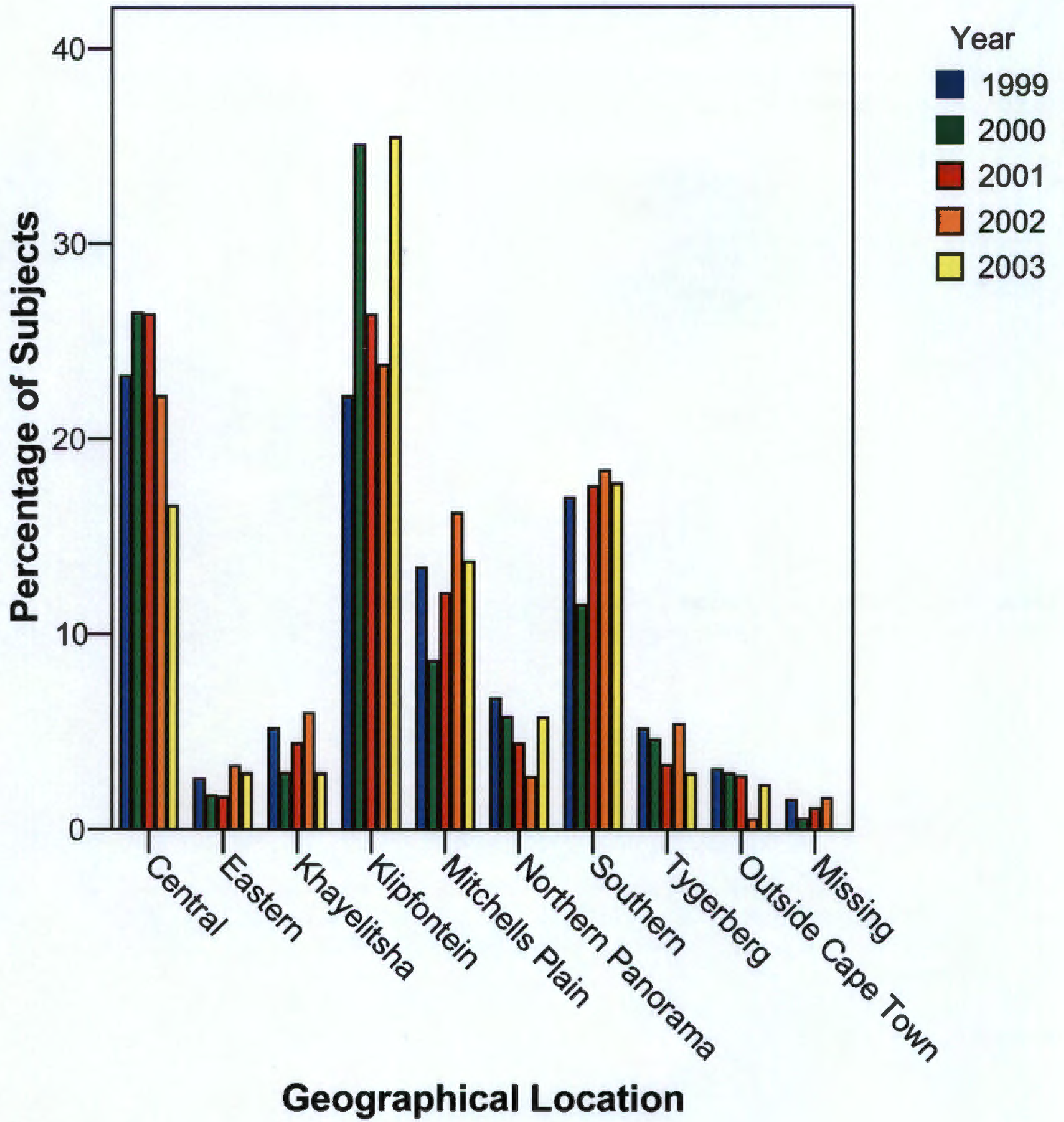

Figure D.9.
Percentage of Subjects per Geographical Location who attended the Speech Therapy and Audiology OPD within each year

Table D.22.
Number and Percentage of Subjects who attended appointments over varying time periods from the subjects who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent	Cumulative Percent
1 Appointment booked	277	38.5	38.5
0-3 months	236	32.8	71.3
3-6 months	65	9.0	80.4
6-9 months	34	4.7	85.1
9-12 months	25	3.5	88.6
12-15 months	9	1.3	89.8
15-18 months	9	1.3	91.1
18-21 months	5	.7	91.8
21-24 months	8	1.1	92.9
24+ months	27	3.8	96.7
Missing	24	3.3	100.0
Total	719	100.0	

The cumulative percentage shows the percentage of subjects who attended the number of appointments in that row and anyone who attended appointments in rows above that one (i.e. anyone who attended less appointments).

Table D.23.
Number and Percentage of Subjects who attended different numbers of appointments from those who attended the Speech Therapy and Audiology OPD from 1999-2003

	Frequency	Percent	Cumulative Percent
1	353	49.1	49.1
2	153	21.3	70.4
3	86	12.0	82.3
4	37	5.1	87.5
5	23	3.2	90.7
6	12	1.7	92.4
7	11	1.5	93.9
8	5	.7	94.6
9	3	.4	95.0
10-19	27	3.8	98.7
20-29	3	.4	99.2
30-39	6	.8	100.0
Total	719	100.0	

Table D.24.
Percentage of Subjects within each Speech-Language and Audiology Diagnosis who attended different numbers of appointments from those who attended the Speech Therapy and Audiology OPD from 1999-2003

	Time period										Total
	1 Appointment Booked	0-3 months	3-6 months	6-9 months	9-12 months	12-15 months	15-18 months	18-21 months	21-24 months	24+ months	Missing	
Hearing Loss/Tinnitus (n=220)	50.9%	25.9%	6.4%	2.3%	3.2%	1.4%	.9%		1.4%	7.3%	.5%	100.0%
Voice (n=148)	17.6%	50.0%	12.2%	5.4%	2.0%	1.4%	.7%	1.4%	.7%	4.7%	4.1%	100.0%
Neuro Communication (n=84)	27.4%	42.9%	11.9%	3.6%	3.6%	1.2%	1.2%			1.2%	7.1%	100.0%
Dysphagia (n=13)	30.8%	46.2%	7.7%	7.7%	7.7%							100.0%
Dysphagia and Neuro Communication (n=33)	24.2%	57.6%	3.0%	3.0%	3.0%					3.0%	6.1%	100.0%
Fluency (n=54)	31.5%	22.2%	14.8%	11.1%	5.6%	1.9%	1.9%		5.6%	1.9%	3.7%	100.0%
Phonology/Articulation/ Oral Motor (n=23)	34.8%	34.8%	4.3%	8.7%		4.3%	4.3%		4.3%		4.3%	100.0%
Language (n=21)	47.6%	19.0%	19.0%	9.5%	4.8%							100.0%
Language and Learning Disability (n=25)	32.0%	36.0%	12.0%	4.0%			8.0%	4.0%			4.0%	100.0%
Multiple Difficulties (Paediatrics) (n=48)	39.6%	12.5%	8.3%	10.4%	12.5%	2.1%	2.1%	4.2%		2.1%	6.3%	100.0%
None (n=41)	87.8%	7.3%	2.4%								2.4%	100.0%
Missing (n=4)	75.0%	25.0%										100.0%
Other (n=3)	33.3%	33.3%									33.3%	100.0%
Undiagnosed (n=2)	100.0%											100.0%
Total (n=719)	38.5%	32.8%	9.0%	4.7%	3.5%	1.3%	1.3%	.7%	1.1%	3.8%	3.3%	100.0%

Table D.25.
Percentage of Appointments Attended by Subjects who had 2, 3, 4 or 5 Scheduled Appointments from the sample of subjects who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent	Cumulative Percent
20-29%	3	.9	.9
30-39%	7	2.1	3.0
40-49%	5	1.5	4.4
50-59%	81	24.0	28.4
60-69%	51	15.1	43.5
70-79%	34	10.1	53.6
80-89%	19	5.6	59.2
100%	138	40.8	100.0
Total	338	100.0	

Table D.26.
Percentage of Appointments Attended by Subjects who had 6, 7, 8 or 9 Scheduled Appointments from the sample of subjects who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent	Cumulative Percent
30-39%	2	4.5	4.5
40-49%	1	2.3	6.8
50-59%	10	22.7	29.5
60-69%	10	22.7	52.3
70-79%	8	18.2	70.5
80-89%	8	18.2	88.6
100%	5	11.4	100.0
Total	44	100.0	

Table D.27.
Percentage of Appointments Attended by Subjects who had 10-19 Scheduled Appointments from the sample of subjects who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent	Cumulative Percent
20-29%	1	2.8	2.8
40-49%	2	5.6	8.3
50-59%	1	2.8	11.1
60-69%	9	25.0	36.1
70-79%	12	33.3	69.4
80-89%	4	11.1	80.6
90-99%	5	13.9	94.4
100%	2	5.6	100.0
Total	36	100.0	

Table D.28.
Percentage of Appointments Attended by Subjects who had 20-29 Scheduled Appointments from the sample of subjects who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent	Cumulative Percent
40-49%	1	14.3	14.3
50-59%	1	14.3	28.6
60-69%	2	28.6	57.1
70-79%	1	14.3	71.4
80-89%	1	14.3	85.7
90-99%	1	14.3	100.0
Total	7	100.0	

Table D.29.
Percentage of Appointments Attended by Subjects who had 30 or more Scheduled Appointments from the sample of subjects who attended the Speech Therapy and Audiology OPD from 1999-2003

	Number	Percent	Cumulative Percent
60-69%	1	12.5	12.5
70-79%	3	37.5	50.0
80-89%	4	50.0	100.0
Total	8	100.0	

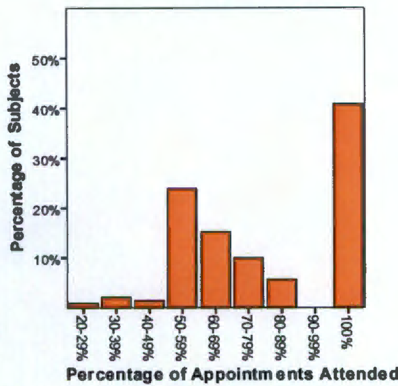

Figure D.10.
Percentage of Appointments Attended by Subjects who had 2, 3, 4 or 5 Scheduled Appointments (n=338)

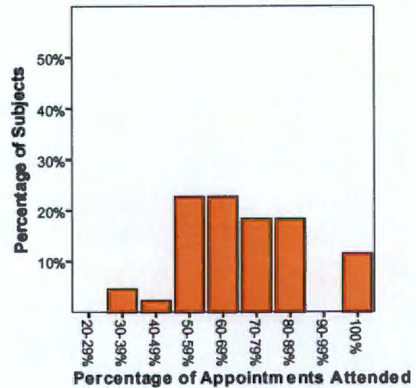

Figure D.11.
Percentage of Appointments Attended by Subjects who had 6, 7, 8 or 9 Scheduled Appointments (n=44)

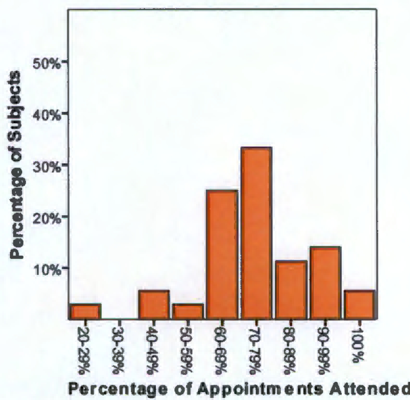

Figure D.12.
Percentage of Appointments Attended by Subjects who had 10-19 Scheduled Appointments (n=36)

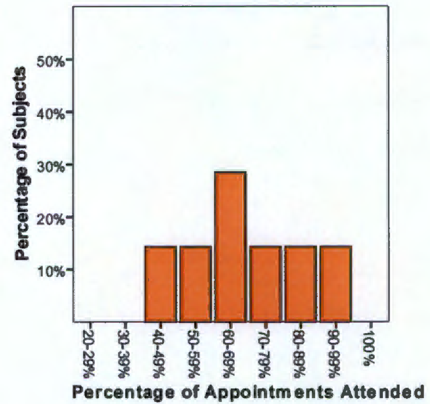

Figure D.13.
Percentage of Appointments Attended by Subjects who had 20-29 Scheduled Appointments (n=7)

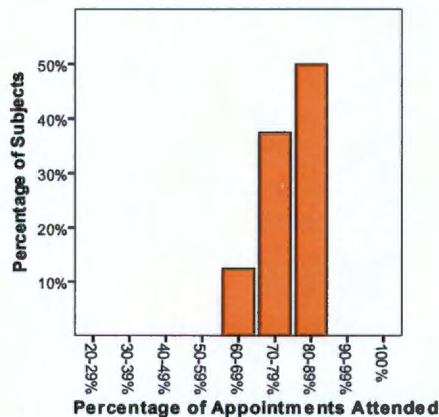

Figure D.14.
Percentage of Appointments Attended by Subjects who had 30 or more Scheduled Appointments (n=8)

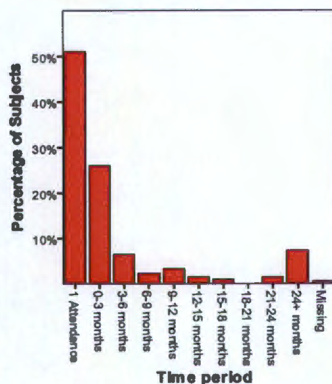

Figure D.15.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Hearing Loss/Tinnitus who attended over different time frames (n=220)

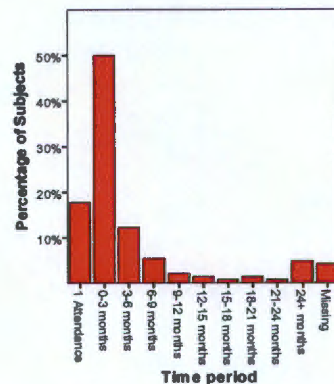

Figure D.16.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Voice (incl. Voice and Dysphagia) who attended over different time frames (n=148)

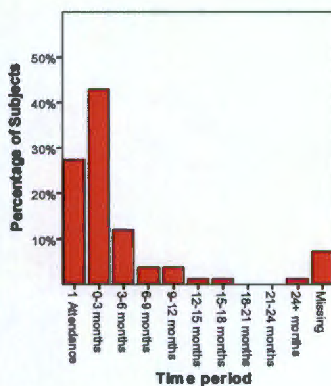

Figure D.17.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Neurological Communication Disorder who attended over different time frames (n=84)

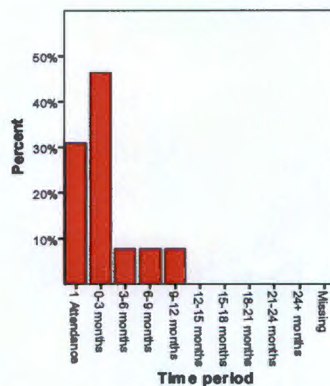

Figure D.18.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Dysphagia who attended over different time frames (n=13)

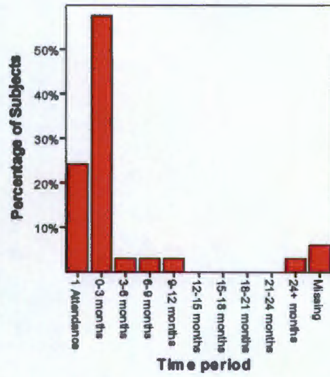

Figure D.19.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Neurological communication disorder and Dysphagia who attended over different time frames (n=33)

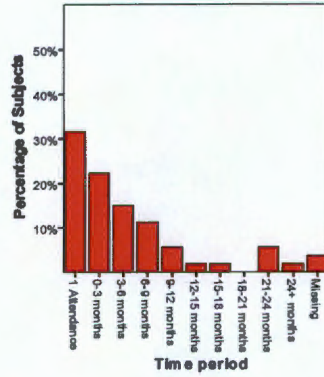

Figure D.20.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Fluency who attended over different time frames (n=54)

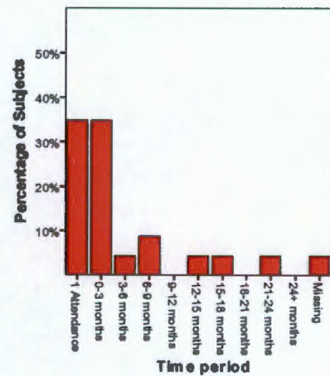

Figure D.21.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Articulation/Phonology/Oral Motor who attended over different time frames (n=23)

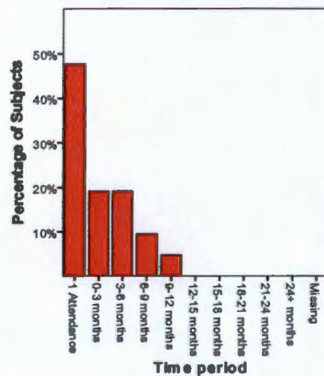

Figure D.22.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Language who attended over different time frames (n=21)

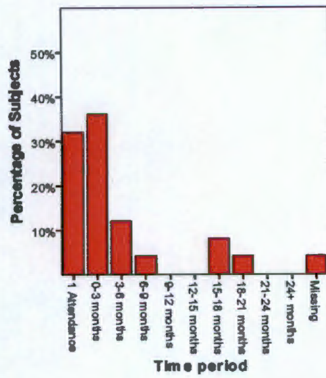

Figure D.23.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Language and Learning Disability who attended over different time frames (n=25)

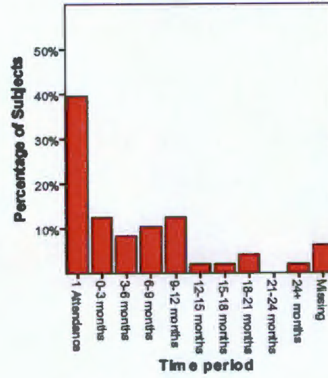

Figure D.24.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Multiple Difficulties who attended over different time frames (n=48)

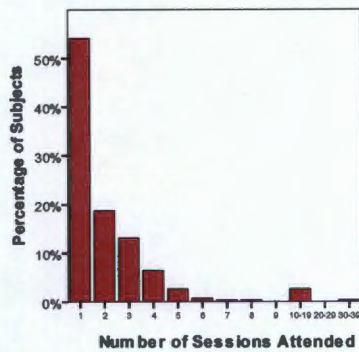

Figure D.25.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Hearing Loss/Tinnitus who attended different numbers of appointments (n=220)

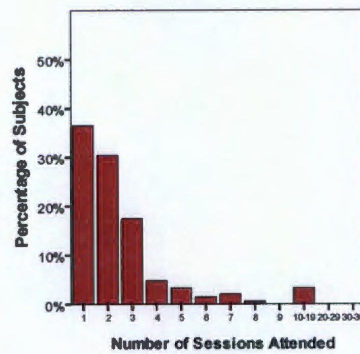

Figure D.26.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Voice (incl. Voice and Dysphagia) who attended different numbers of appointments (n=148)

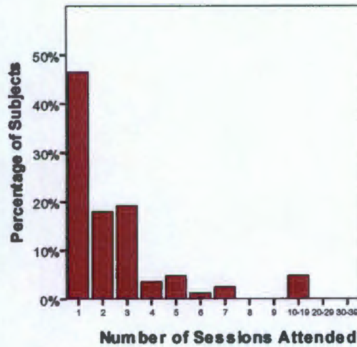

Figure D.27.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Neurological Communication Disorder who attended different numbers of appointments (n=84)

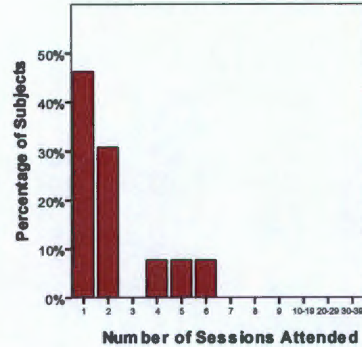

Figure D.28.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Dysphagia who attended different numbers of appointments (n=13)

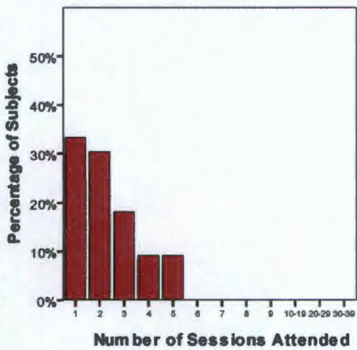

Figure D.29.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Neurological communication disorder and Dysphagia who attended different numbers of appointments (n=33)

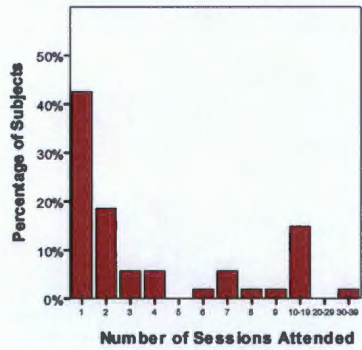

Figure D.30.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Fluency who attended different numbers of appointments (n=54)

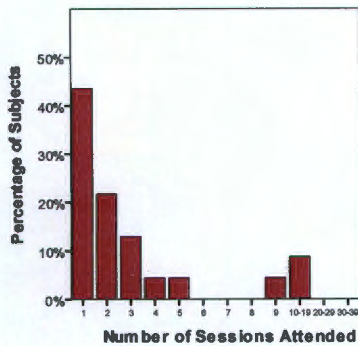

Figure D.31.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Articulation/Phonology/Oral Motor who attended different numbers of appointments (n=23)

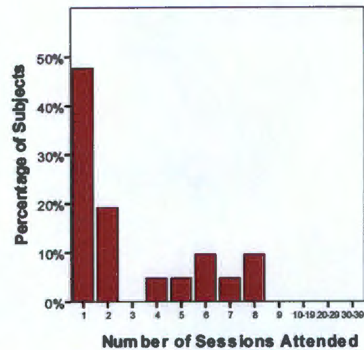

Figure D.32.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Language who attended different numbers of appointments (n=21)

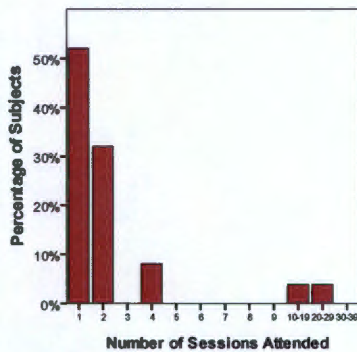

Figure D.33.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Language and Learning Disability who attended different numbers of appointments (n=25)

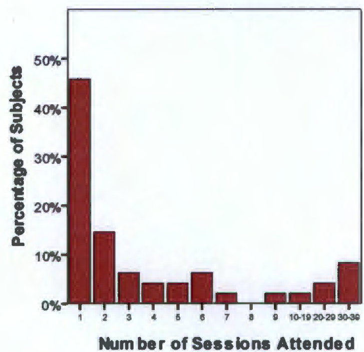

Figure D.34.
Percent of Subjects who attended the Speech Therapy and Audiology OPD for Multiple Difficulties who attended different numbers of appointments (n=48)

Appendix E

Health Service User Population in the Western Cape

Metro Health Districts user populations (Allied Health Professionals Technical Committee, 2004)

Northern Panorama	19057	8.43%
Central	18291	8.09%
Southern	21252	9.40%
Klipfontein	37169	16.44%
Mitchells Plain	32812	14.51%
Tygerberg	31872	14.10%
Khayelitsha	38276	16.93%
Eastern	27381	12.11%
Total	226110	100%

User populations in the Western Cape (Allied Health Professionals Technical Committee, 2004)

Boland	49358
Metro	226110
S. Cape	48801
W. Coast	59027