University of KwaZulu-Natal

Integrating spatial, temporal, referral problem and demographic approaches to establish systematic baseline data to inform future evaluations at the Pietermaritzburg Child and Family Centre.

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Masters in Social Science (Research Psychology)

2013

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2013

Dissertation submitted in partial fulfilment of the requirements for the degree of Masters in Social Science (Research Psychology)

University of KwaZulu-Natal

DECLARATION

Submitted in fulfilment / partial fulfilment of the requirements for the degree of

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ACKNOWLEDGEMENTS

ABSTRACT

This exploratory retrospective record review extending from 1975 – 2013 of the Pietermaritzburg Child and Family Centre (hereafter referred to as the "CFC") aimed to create a database to electronically capture CFC records to generate descriptive statistics, and the create CFC user profiles utilising multiple data analysis methodologies in order to create baseline data to inform future program evaluations. To date, no formal program evaluation has been conducted by the CFC, resulting in programs being launched without the backing of systematic and empirical data used to inform decisions. Data driven decision making is imperative when deciding on resource allocation to ensure maximum derived benefits.

The study sample totalled 1974 records from the past three decades since CFC inception in 1975. These records were captured electronically in a Microsoft Access database. SPSS and ArcGIS were used to analyse the data to create service user profiles, and gather baseline data to inform future Needs Assessments and Program Evaluations.

The study found temporal changes in CFC user demographics, referral problems, socio-economic standing, and referral schools since inception in 1975. The study explored, using geographic information software, client distribution of demographics, residence, referral problem, and CFC service reach, and found that there are significant geographical variations in each of these constructs. The geographic variations, together with the statistical findings highlight the importance of establishing Monitoring and Evaluation systems in order to stay relevant to the needs of CFC users. Further, findings suggest a tailored approach to CFC program development and focus, depending on future CFC priorities.

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ACRONYMS AND ABBREVIATIONS

ACF	Autocorrelation Function
ANOVA	Analysis of Variance
BoD	Burden of Disease
CBD	Central business District
CFC	Child and Family Centre
DALY's	Disability-Adjusted Life-Years
DPA	Data Protection Act
DSM	Diagnostic and Statistical Manual
ECA	Epidemiological Catchment Area
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Disease
KZN	KwaZulu-Natal
M1's	First Year Clinical/Counselling/Education Masters Students
PMB	Pietermaritzburg
GIS	Geographic Information System
M&E	Monitoring and Evaluation
NA	Needs Assessment
NHS	National Health Service
OECD/DAC	Organisation for Economic Cooperation and Development
PACF	Partial Autocorrelation Function
PHC	Primary Health Care
PTSD	Post-traumatic Stress Disorder
SAHS	School of Applied Human Sciences
SASH	South African Stress and Health Study
SDF	Spatial Development Framework
SES	Socio-economic Status
SPSS	Statistical Package for the Social Sciences
TB	Tuberculosis
WHO	World Health Organisation

CHAPTER 1: INTRODUCTION

1.1. Introduction

This study is an evaluative study entailing a retrospective record review of the Pietermaritzburg School of Applied Human Sciences (hereafter referred to as "SAHS"), Discipline of Psychology's Child and Family Centre (hereafter referred to as "CFC") patient records. The CFC is a University-based mental health service centre serviced by first and second year Clinical, Counselling and Educational Masters students, interns and qualified psychologists; and follows a three-pronged objective:

- To provide professional psychology training to interns and first year professional psychology Masters students (hereafter "M1's") in the clinical and counselling Masters Professional Psychology program;
- To offer psychological services to those members of the community who can least afford private services; and
- To conduct research on child and family mental health and inform program development

The sheer demand and length of the waiting list at the CFC demonstrates an urgent and unmet need for psychological services by many in the community (Killian pers. comm., 2008).

Rather than remain dedicated to individual pathology, the CFC has recently integrated the benefits associated with community-, rather than, individual-level approaches to understanding and treating mental health into their programs (Killian pers. comm., 2009; Waldo & Coates, 2000; Heller, Price, Reinharz, Riger, Wandersman & D'Aunno, 1984; Poland, Maticka-Tynsale & Ferris, 2004; Wilkinson, 1996). The aim is to contextualise CFC programs within the broader social, political and cultural context (Poland, Maticka-Tynsale & Ferris, 2004). Despite this crucial shift, CFC program design and implementation remains largely uninformed by its own service user and referral problem history. This compromises program planning and monitoring and goal satisfaction, as programs have not been contextualised within its own unique history and service provider niche.

Knowledge of the cultural and socio-economic context needs to be incorporated into and enhance service user understanding. This not only optimises program design, but also informs decision making. The benefits of empirically informed decision making are well known (Murray, Nelson, Poland, Maticka-Tynsale & Ferris, 2004; Common Wealth Department of Education, Science and Training, 2002; SIRC, 2006). South Africa is a crucial site for exploring potential long-term psychological distress associated with political violence, unemployment, ill-structured and unequal access to health facilities, housing shortages, overcrowding, lack of quality education, and poverty. For South African youth this reality is further compounded by additional challenges to the "normal" hardships of growing up (Slone, Kaminer & Durrheim, 2000; Aitchison, 2003). As such, South Africa provides fertile grounds for examining psycho-social stress and mental health.

The CFC has recently launched several programs in response to a growing need for affordable and accessible services. However, despite a growing orientation towards data-driven interventions, the CFC has not as yet conducted any formal research in respect of same.

Data-driven interventions have become vital in initiating and evaluating programs (Doyle, 2003; Carr, 2001; Common Wealth Department of Education, Science and Training, 2002; SIRC, 2006). Before a program can be instituted, a clear articulation of its goals and intended outcomes is required. Goal articulation has implications for resource allocation and general program design. In resource constrained settings where efficient and effective resource allocation is pivotal, baseline data has been proven to be indispensable when making informed and contextually appropriate decisions (World Bank Group, 2007). Informed decisions maximize resource utilisation in order for goals to be met in the most efficient manner, and to ensure structures are in place to evaluate the efficacy of goal fulfillment (ibid).

This study will attempt to orientate the CFC towards a more data-driven approach to evaluation and program implementation by retrospectively analysing the CFC's clinical records. CFC clinical records offer unique research opportunities across a range of health research domains including diagnostic practices, demographic research and the analysis of therapeutic and intervention trends, amongst others.

Baseline data gathered here will be used to conduct an historical service evaluation concentrating on demographic, referral problem and spatial characteristics of services and service recipients. Apart from a study conducted by Christina Mitchell in 2012 on diagnoses, testing and assessment practices with regards to the CFC, and Aurene Willford in 2011, on the diagnostic ability of ADOS, this study will attempt to further strengthen the position of the CFC evaluation footing. An electronic database for record keeping has been developed (by the author) within which all records from inception up to present have been captured. This electronic record database will be integrated with a Geographic Information Systems (hereafter referred to as "GIS") allowing for a powerful spatial analysis of service reach, distribution of referral mental health problems and bringing the power of health geography to service evaluation. This information will provide the baseline data and establish an electronic record database for ongoing service evaluation, research and program development, in an effort to tailor programs to better meet user demand. Further, this dissertation aims to contextualise user profile composition and change over the past three decades since inception in 1975. This information will be used not only to gain an understanding of the service users, but also to establish and utilise the data to fuel an understanding of what programs are required and how existing programs need to be changed in order to better meet mental health demands.

1.2. Rationale

This study is aimed at achieving two outcomes. Firstly, it aims to perform a descriptive function by providing baseline data of CFC services and service user history. Secondly, it aims to use the data

generated from the first aim to perform a formative program evaluation framed within critical realism. To achieve these aims, the literature dealing with program evaluation will be reviewed, and an argument for critical realist evaluation, which acknowledges the importance of environment-person interaction in creating insights into health disparities, will be made. Geographic approaches will be employed as a tool to aid both the first and second aim, as it will allow for a greater understanding of CFC service users, and therefore serve as a benchmark to which current programs can be compared.

By incorporating both formative program evaluative methods and GIS technologies, this study seeks to inform the development of local social, economic, political and culturally relevant programs aligned with current CFC thinking and planning.

CHAPTER 2: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2. Literature Review

This project hopes to contribute to the overarching goal of a comprehensive exploratory CFC user analysis in order gather baseline data to inform future CFC program evaluations and make recommendations on the way forward for the CFC. Different techniques will be used to explore service user data. Accordingly, the literature review will focus on:

- Epidemiology, the current status, and need for mental health services in South Africa
- Dominant mental health service models pertaining to the CFC
- The features of program evaluation
- Features of "access", service use and service reach
- Future CFC reviews and planning processes will need to be informed by its own mission and goals. Embedded within its institutional, local, community, national and historical context. Therefore, the literature will contextualise the CFC, both within the Msunduzi region, and as a tertiary-based mental health service centre
- The service learning context is an important one for service settings like the CFC, and this review concludes with looking at service learning in tertiary contexts and their relative contributions to communities as a whole.

2.1. Epidemiology

Epidemiology is defined as "…the study of the distribution and determinants of disease…" (Lilienfeld, 1976, p. 185). Epidemiologists are primarily concerned with determining how and what mechanisms are involved in the transmission of disease within specific contexts (Mujica, 2007). Epidemiology makes sense of disease in terms of incidence (newly diagnosed cases), and prevalence (the total number of cases present in that population during a specified period of time) (Pilgrim, 2007). Determining the relationship between a disease and an affected population allows for the elimination or control of that disease. A sub-field of epidemiology, known as Psychiatric Epidemiology, will be discussed even though this study does not explicitly deal with estimates of prevalence or incidence as it provides a framework within which the study is positioned.

2.2.1. Psychiatric Epidemiology

Psychiatric Epidemiology refers to a descriptive method of estimating the prevalence of mental disorder and its associated sub-types. It is argued that estimating incidence and prevalence of mental disorders is significantly harder than traditional epidemiology (which focuses on physical disease), as the validity criteria for assessing mental disorders effect what is being counted (Pilgrim, 2007). The result of criticisms directed Psychiatric Epidemiology to take on more of a descriptive role, aimed at identifying risk factors associated with certain mental health, illness, or outcomes (Bradshaw et. al.,

2009), and define the need for mental health services. Epidemiological data demonstrates this need allowing a link between mental health services and resource allocation, maximising the treatment and management of psychiatric disorders. This means that, mental health service provision can be planned more accurately, especially in resource constrained settings, where mental health needs surpass current nation-wide service provision.

2.2.2. Need for Mental Health Services

"The effects of apartheid - poverty, malnutrition, infectious diseases and violence have left a harsh legacy" (Burke, 2004, p. 5).

Worldwide, mental and neurological disorders account for 14% of the global burden of disease (hereafter referred to as "BoD"), and over 30% of disability-adjusted life-years (DALY's) (Burns, 2011). There is a global under appreciation of the adverse impact of mental disease. It is the second leading cause of disability and premature mortality (WHO, 2001). In South Africa, 18 million people are reported by the National Congress Health Care Plan of 1994 to be living below the accepted "minimum living level". Ninety five percent of these people are Black. A further 60% of this statistic lives in total poverty (Burke, 2004, p. 6). According to the Living Conditions Survey conducted by Stats SA (2012) 56.8% of South Africans live in poverty. This means that 25,6 million people and 4,8 million households were living below the upper-bound poverty line of R577 per person per month (Stats SA, 2012, p. 20). This marks a slight decrease in poverty from 57.2% in 2006. The highest levels of poverty are found in the Limpopo Province, followed by the Eastern Cape, Mpumalanga and KwaZulu-Natal (ibid). According to Stats SA (2012), those residing in traditional areas, compared to those residing in other areas, are most effected by poverty, with 47.5% of those in traditional areas living below the food poverty line, and 79.1% below the upper-bound poverty line. They noted a gender differential in these estimates, as females living below the poverty line exceeded their male counterparts by 7.2%.

Nationally, 41.4% of households reported having a flushing toilet, of which, only 17% of which were on site (Stats SA, 2012). Within the Msunduzi region, 73.7% of residents occupying formal residences equal 73.7%, with only 47.9% having access to piped water, and only 51.6% a flushing toilet (Stats SA, 2012).South Africa is also ranked the second highest country in terms of income inequality, 19th highest in unemployment rates, has amongst the highest crime rates and ranks highest in road accident death rates worldwide (Burns, 2011). Over a quarter (25.7%) of South Africans reported their standard of food consumption was less than adequate (Stats SA, 2009).

Three million adults are said to be considered to be functionally illiterate, and 150 000 people attempted suicide per year prior to 2004, and thousands of people have been reported to be experiencing Post Traumatic Stress Disorder (hereafter referred to as "PTSD") (Burke, 2004; De Jong et al., 2001; Kagee, 2005). Apartheid, especially the passing of the Group Areas Act (1951) divided South Africa into ten Bantustans, leaving the country disjointed, broken and ill-equipped to bear the

burden of providing adequate mental health services to its citizens. This situation is still apparent today, making the multi-faceted requirements of mental health (i.e. school and workplace mental health promotion areas, government departments, stakeholders etc. all required to work collaboratively) a very difficult task.

Up until the South African Stress and Health Study (hereafter referred to as "SASH"), conducted between 2002-2004 as part of the World Mental Health Surveys Initiative, there had not been much epidemiological data on mental illness in South Africa. The SASH study found that South Africa's mental health profile resembled that of Colombia and Lebanon, having undergone similar socio-economic and political atrocities. SASH found that 30.3% of the 4351 persons sampled had a lifetime mental disorder. Of these lifetime disorders, anxiety disorders were the most prevalent affecting 15.8% of individuals, followed by substance abuse disorders at 13.3%. A prevalence of 5.8% indicates that South Africans rank about twice as high in substance abuse compared to other countries worldwide (Williams et al., 2008; Schneider et al., 2007). The substance most abused by South Africans is alcohol, which contributes to interpersonal violence and is the cause of Fetal Alcohol Syndrome. Mood disorders were found to be prevalent in 9.8% of the cases. Of the disorders reported, 26.2% of cases within the 12-month mental disorder category were considered severe (Bradshaw et al, 2009).

WHO-AIMS (2007) reported that of the budget allocated to health services per province in South Africa, only 5-14% of this budget is actually used for mental health expenditures. There are only 23 mental hospitals in South Africa, which means a total of 18 beds per 100 000 population (ibid). Only 1% of these beds are reserved only for children and adolescents.

Most mental illnesses reported in South Africa surpassed individual physical disabilities and conditions such as asthma, cancer, diabetes, and with more adverse effects (Suliman et al., 2010). In other words, mental health has amore adverse effect than any other non-mental illness. Mental illness is further exacerbated by other major contributors to BoD, such as violence, Maternal and Child Health, and HIV/AIDS and Tuberculosis (hereafter referred to as "TB"). South Africa, being at the epicenter of the HIV/AIDS pandemic, has an estimated figure of HIV-related mental illnesses (such as depression, PTSD, suicide, HIV-associated neuro-cognitive disorders) of 47-56% (Martin & Kagee, 2011). Women are more likely than men to have reported a severe mental health disorder within the 12 month category. Children below the age of 15 years constitute half of the Black population, of which, 3% suffer from a mental disorder as a result of parental neglect (Okasha, 2002).

The SASH study indicated a general association between early onset of mental disorders and lowered educational achievement. This indicates that early interventions aimed at identifying and managing mental illness in youth is imperative (Williams et al., 2008). Mental health programs aimed at helping children are meant to not only reduce the impairments that accompany mental illness, but also optimize their development and well-being whilst ensuring that optimal use of public funds are

made (PMHPP, 2003). By meeting these ends long-term costs associated with prevalence rates in children can be reduced (Chase – Lansdale & Hetherington, 1990, Brown & Harris, 1978, in Cox, 1987, Puckering, 1989, Zajicek & DeSalis, 1979).

Unless drastic action is taken, the burden of mental illness is estimated to increase from 12% in 2000 to 15% in 2020, incurring tremendous suffering, disability and economic costs (WHO, 2001).

Very often, chronic mental disorders demand "integrated treatment and support services to reduce disability, increase social functioning and improve quality of life" (Katschnig et al., 1997, p. 7). There has been a shift towards decentralization of mental health services to general health care (Provincial Mental Health Planning Project, 2003). In South Africa specifically, mental health has become part of primary health care service provision. Since the advent of a democratic political dispensation in 1994, health care was restructured (Peterson *et al*, 2009). There was a decentralization (from urban areas) and integration of mental health service provision into Primary Health Care facilities (hereafter, PHC) (ibid). Screening, emergency, and psychopharmacological management at a PHC level ensued. Despite decentralization and cost-effective treatment to eradicate the symptomatic and debilitating components of mental conditions (Nathan & Gorman, 1998, p. 7), there has been poor uptake of mental health services. Seedat et al. (2009) reported a treatment gap of 75%. This means that within a 12 month cycle, only 1 out of every 4 people with a mental disorder, received treatment. This gap is said to exist because Primary Health Care facilities misidentify mental disorders resulting in incorrect treatment options. This hints at inadequately trained PHC staff, lack of referral options and lack of mental health specialists at district levels (Petersen and Lund, 2011).

Further, stigma and myths associated with detection and treatment inhibit sufferers from seeking treatment (Gubinat et al., 2004). Burns (2011) further suggests the lack of maintenance of psychiatric hospitals; shortage of mental health practitioners; lack of tertiary psychological services development and lack of rehabilitation are contributors to the treatment gap. In KwaZulu-Natal, budget allocation to psychiatric services has only increased by a mean annual percentage of 3.8 which is significantly lower than general hospitals (Burns, 2011). Peterson *et al.*, (2009) conducted a qualitative situational analysis, and found that the lack of realisation of decentralized benefits of psychological services at PHC facilities are largely due to the lack of utilisation of specialist and community-based resources. In fact, in South Africa, per 100 000 population, there is 0.28 Psychiatrists, 0.32 Psychologists, 0.4% Social Workers, 0.13 Occupational Therapists, and 10 Nurses (Burns, 2011). These numbers are 30% less than the required 1 per 100 000 population requirement. This means that existing mental health providers are faced with ever increasing demands for psychological services with minimal budgets. Peterson *et al.*, (2009) suggest a need to inject specialist and community-based workers into these PHC packages to make them more appropriate and accessible. Data-driven decision making is imperative in ensuring that resources are best allocated to maximize health and service benefits to clients, and ensuring equitable access to all, however, there are poor monitoring mechanisms being in place. It seems that even if services are made available to all, barriers to access exist.

2.2.3. Access to Mental Health Services

Stats SA (2009, p. 22) demonstrated that, of the 78.5% of the population who fell sick, and consulted with a health worker based at a facility closest to their dwelling, 84.6% were Coloured, 79% were white, 77.9% African, and 74.7% Asian.

Table 1.1. Distance to health facility by area classification

Type of settlement	Health facility	Less than 500 m (%)	Less than 2 km, more than 500 m (%)	Less than10 km, more than 2 km (%)	More than 10 km (%)
Urban formal	Clinic	18,6	52,4	24,3	4,7
	Hospital	2,9	30,9	40,3	25,9
Urban informal	Clinic	16,1	53,4	23,1	7,3
	Hospital	1,0	29,3	35,6	34,1
Tribal area	Clinic	9,1	41,0	31,5	18,5
	Hospital	0,7	8,9	26,0	64,3
Rural formal	Clinic	13,6	16,7	18,5	51,2
	Hospital	0,1	9,5	14,2	76,3

Source: Statistics South Africa, 2009, pg. 27

From the above table, it is evident that in general, people will travel further for hospital services, than clinic. Further, the majority of households in tribal and rural formal areas (64,3% and 76,3% respectively) live in more than 10 km radius from a hospital, and the majority of households in urban formal and urban informal areas (52,4% and 53,4% respectively) live within a 2 km radius of, but more than, 500 m away from a clinic (Stats SA, 2009, p. 27). These patterns of service uptake need to be further understood. 8,6% of poor households in traditional areas have access to a hospital within a 2 Km radius of their dwelling. A further 46,0% were within a 2 Km radius of a clinic/community health care centre.

Access in mental health settings allow us to understand patterns surrounding healthcare uptake. Access can be grouped into five dimensions or the "five A's", which include: (Penchansky & Thomas, 1981)

- **Availability** – the choice of health care facilities available to the person from which they can choose
- **Accessibility** – these are barriers confronted in travelling to the service
- **Affordability** – the degree of fit between the service charges and clients ability to meet those costs, knowledge of those costs, and potential credit agreements
- **Acceptability** – the degree of fit between the attitudes towards personal and practice characteristics and that of clients, including cultural consonance

- **Accommodation** – way in which resources have been organised i.e. accept or deter clients (this includes operating hours, telephone service etc.), client's perception of their appropriateness and their convenience to consumers.

Hunter *et al.* (1986, in Shannon and Dever, 1974) identified distance to health care facilities as a major barrier to healthcare access. Subsequently, attempts have been made to measure spatial accessibility of health service providers, identify where there are provider shortages and reveal social disparities in both rural and urban areas within South Africa (Shannon & Dever, 1974).

Currat (2002) conducted an Epidemiological Catchment Area (ECA) investigation into service use and concluded that the overlap between users who are sick and those utilising the service was a mere 8.1%. KwaZulu-Natal has one of the lowest rates of access with 24% of urban dwellers accessing services compared to 6% in non-urban areas (SADHS, 1998). Stats SA (2009, p. 28) indicate that more than half of South Africans (62%) live within 500m access to public transport, with a mere 1.6% more than 10km away from it.

Access in this project is of particular relevance to understanding the potential patterns that may arise through spatial analysis. In order to answer questions like: "Why do people who reside further away from the CFC utilise CFC service less frequently than those users closer to the CFC?" by looking at components like availability, accessibility to the CFC, and aggregate fees people are able to afford. There is, however, a lack of data, other than that for physical illness, regarding the utilisation and service uptake of mental healthcare services in South Africa. Further, the CFC is not part of the public health sector, so issues of catchment targets, universal access and general population access and utilisation rates are not applicable. However, these kinds of analyses are useful to represent the service access and to help inform the CFC in planning for priority access. This is an important feature as reviewed literature on tertiary-based service centres is limited. Further, it is assumed that national policies governing mental health services similarly governed service provision within that centre. In this study, however, this is not the case. The CFC has a mission and methods for achieving its goals, subject to the ethos of the School of Applied Human Sciences (SAHS) Discipline, Psychology and the University of its KwaZulu-Natal as a whole.

Lazarus (2001) mentions how, despite the long standing tradition that tertiary institutions have with teaching, research, and service provision, little is known about the service provision component, often regarded as being the least scholarly (Lazarus, 2001).

2.2.   Mental Health Service Delivery

There is growing support for multidisciplinary teams in response to mental health. Mental health promotion programs need to "…occur within a multi-agency collaborative environment and be grounded in a strong community base;…should be responsive to the cultural context and

characteristics of the populations served; (and)…families should be partners in the planning, implementing and evaluating of the system of care' (SAMHS, 2004, p.199). Recently, the CFC's triadic focus has fallen on community needs. Whether it is entirely responsive to these community needs is as yet unknown.

The Provincial Mental Health Planning Project (2003) outlined several core principles in planning mental health service delivery, these include:

- **Participation -** Mental health service should involve all stakeholders, users, providers etc. when planning and delivering programs and services
- **Continuity of Care -** The planning and delivery of mental health services should be done collaboratively such that they provide a continuity of care to all service users
- **Efficiency -** Both the users and providers of services need to ensure that they utilise resources and services sensibly
- **Focus on Independence -** Mental health services need to be structured in a manner that they enable clients to live a life as independent as their capacity permit using community care options, before making use of intensive inpatient care
- **Appropriateness -** The service provided needs to meet the client's needs
- **Accessibility -** Mental health services, and information to inform patient decisions need to be easily accessible
- **Responsiveness -** Be responsive to a wide spectrum of mental health and illness problems
- **Prevention of relapses**

As per the core principles in planning for delivery of mental health service at the CFC the requirements for Participation and Continuity of care have been seen to as the CFC involves multiple stakeholders and continuity of care is ensured, despite new interns coming in annually as a result of collaborations with schools, independent psychologists, psychiatrists, occupational therapists, general practitioners and the like. Further, the CFC ensures that it is responsive–as a wide range of mental health issues have been dealt with at the CFC. Where current CFC Programs fall short, however, is when looking at the requirements for appropriateness, as the absence of systematic collection of data, and review thereof has rendered it impossible to ascertain if client needs have been met. Further, efficiency cannot be gauged as the sensibility with which resources have been used to optimally fulfill needs cannot be established. And lastly, CFC fails to meet the criterion for accessibility, as it is impossible to ascertain if information necessary to inform client decisions has been adequately received.

The reason for the inability to identify gaps in service provision stems from the lack of systematically collected and analysed data. This highlights a need for and the importance of program evaluation. Even though this study does not aim to conduct a program evaluation, it aims to gather baseline data

to facilitate such an evaluation. What will follow is a brief exploration of the methods for data analysis which may be used to determine program outcomes and indicate areas requiring amendment.

2.3.   Program Evaluation

When public health approaches or policies exceed two decades, policy makers, donors and stakeholders become anxious, and often demand a shift in outcome indicators (Sharma, 2004). This process is known as Continuous Improvement (Chowance, 1994, in Kirsh et al., 2005), and has generated systematic advancements in health care, education and in corporate sectors (Cooksy, Gill & Kelly, 2001). Continuous Improvement is captured by Berger's (1974) book entitled "The Homeless Mind", which states that everything in the social life is ready for restructuring and reform (Dahler-Larsen, 2006).

Program evaluation has long been associated with positive outcomes, often exceeding funding and professional norms, advancing the quality of services delivered, increasing community participation and ultimately bringing about improvements in the lives of service users (Kirsh et al., 2005). Program evaluation has proven vital in understanding the "…type, nature, and intensity of services delivered, how services are experienced by program participants, and how services are expected to lead to outcomes…" (Green & McAllister, 2002, p. 3).   To date, however, no formal, systematic and empirically informed restructuring of the mode of CFC service delivery has occurred. Before a program can be evaluated, it first needs to be planned, outcome indicators decided upon, and implemented. Monitoring and Evaluation (hereafter referred to as "M&E") is vital when dealing with the preparation and implementation of programs, allowing for prospective planning, learning from existing program implementation and managing programs (UNICEF, 2003). Furthermore, M&E strongly influences decision-making.

2.4.   Monitoring and Evaluation

M&E is suggested when making decisions regarding improving and modifying of discontinuing existing programs (UNICEF, 2003). The purpose of M&E is primarily to learn both during the process and after implementation as per the evaluation report and secure accountability. Here accountability ensures that accountabilities for expected program outcomes are met (UNICEF, 2003).

Monitoring can refer to one of two activities (UNICEF, 2003, pg. 109-110):
- **Situation Monitoring:** Measures the amount of change (or lack thereof) that has occurred on certain measures. It also includes monitoring of wider contexts.
- **Performance Monitoring:** Measure whether specific objectives have been achieved post-implementation.

Essentially the type of information relating to the progress and implementation of a program will determine the type of monitoring that will ensue. For example, monitoring can focus on results;

process/activity, compliance; context/situational; beneficiary; financial and organisational monitoring (International Federation of Red Cross, 2011). In essence, monitoring refers to the systematic collection and analysis of information to determine if a program is meeting its intended objectives and to ensure compliance with pre-determined standards (ibid). Shapiro (2004) contends that monitoring ensures that projects are sticking to plan and alerts the relevant stakeholders if things are not progressing accordingly. Further, monitoring ensures proper utilisation, sufficiency and appropriateness of available resources. If done correctly, monitoring provides a basis for evaluation (ibid).

The OECD/DAC (1999, p. 4) definition of evaluation refers to the systematic measure of the worth or significance of a program. Findings should be credible, objective, and should therefore influence decision-making based on empirical grounds. Making these judgments of worth allow the service provider to make improvements to the program. Shapiro (2004) contends that evaluation can be either formative or summative. The former refers to measurements taken during the implementation of the program with the intention of making recommendations for improvement. The latter refers to lessons learned post-program implementation (ibid). These concepts will be discussed further under Program Evaluation. Evaluation therefore, regardless of form, is a systematic endeavor in which information is acquired or collected, and used to assess its worth or merit, with the ultimate goal of providing "useful feedback". This feedback assists in decision making (Trochim, 2006).

Monitoring and Evaluation are therefore two distinctive concepts. The former is ongoing and focuses on what is happening, whereas evaluations are conducted at pre-determined, and distinctive points in time to determine if the program is meeting its intended goals and achieving the necessary impact (IFRC-ME, 2011). Despite the characteristics unique to each concept, M&E ultimately aims to systematically measure what you are doing, how you are doing it and make suggested improvements based on how effective, efficient and impacting your program is (Shapiro, 2007). This suggests that proper and detailed planning be performed prior to, during and after program implementation. Monitoring and Evaluation in South Africa rapidly progressed following the first democratic elections in 1994 as a means to improve performance, and to strengthen democracy (Naidoo,). In this spirit, the Public Service Commission (hereafter referred to as, "PSC") has been the driver behind M&E of public administrative departments (Bester, 2009). The PSC has a transversal public service M&E that aims to ensure accountability, transparency and enlightenment (ibid). A systematic review on the mental health status of South African citizens between 2000-2010 by Lund et. al. (2012) note that in order to improve the service provided to members of the public suffering with mental health illness, an accurate assessment of the current South African mental health service status is necessary (ibid). However, Information Systems necessary for M&E are inadequate, or weak, and therefore have undermined any progress. In addition to this, very few provinces in South Africa are able to identify those facilities offering mental health services (WHO-AIMS, 2007). There is a dire need to collect accurate data at a primary and secondary level. As Myers (2012) confirms, there is currently no mechanism in place to facilitate the routine collection of treatment service data in South Africa, and

although the South African Community Epidemiology Network collects data on substance abuse treatment, the efficacy regarding treatment remains unknown. This means the routine monitoring of these services is absent. The World Health Organisation Assessment Instrument for Mental Health Systems (WHO-AIMS) collected information regarding the status of the emtnal health system in SA in 2005 following the acknowledgement of the lack of baseline information available to monitor the mental health system in South Africa. Further, it aimed to improve the monitoring of reform policies, improve community services, and involve stakeholders to promote, prevent, care, and rehabilitate mental health in SA (WHO-AIMS, 2007). They found that of the 9 provinces, 4 indicated that there were no formal requirements and specifications regarding data collection from mental health facilities, and only 1 province utilised service data for their annual mental health service report (ibid). There is currently no official Mental Health policy in South Africa, no nationally agreed indicators of mental health information systems, no information on current mental health service resources, no planning, and no systematic reporting. This not only highlights the lack of monitoring as a result of poorly collected service data, but as a consequence, the lack of mental health service monitoring in South Africa, and the grave consequences thereof for policy and decision making.

In a similar vein, the CFC, as a mental health service provider, falls short in the same manner. Baseline data has not been systematically collected, and captured and therefore compromises the ability for the CFC to routinely monitor and evaluate its programmes, and policies. No formative, summative planning or monitoring and evaluation is being performed, with the resultant effect that CFC resource utilisation, program efficacy, efficiency, impact and targeted goal achievement cannot be measured or gauged. In order for programs to be systematically assessed, the following should be measured (UNICEF, 2003: 111-112; OECD-DAC, 1991):

- **Relevance** – The demonstrated value of the program to all stakeholders and service recipients;
- **Efficiency** – Assessing if the program best utilises available resources to achieve desired outcomes;
- **Effectiveness** – the degree to which outcomes meet stated objectives;
- **Impact** – Assessing if outcomes produced desirable and undesirable results;
- **Sustainability** – Will there be ongoing support from the program?;
- **Coverage** – Service reach, and the impact of the service on particular groups;
- **Coherence** – Are all policies, procedures, and programs coherent?; and
- **Protection** – protection of human rights.

It is imperative that CFC programs be measured, and scored in order to determine the extent to which programs sufficiently meet these outlined criteria. More specifically, this study aims to create baseline measures to evaluate CFC programs in terms of relevance, efficiency and coverage. As illustrated using the figure below, the M&E essentially an ongoing activity.

Figure 2.1. The Monitoring and Evaluation Cycle

Source: International Federation of Red Cross and Red Crescent Societies, 2011: 10

The above M&E cycle refers to the ongoing process of monitoring and evaluation. There needs to be (IFRCRCS; 10):

- **Initial Needs assessment -** To determine what projects are needed and to assist in their planning;
- **Log-frame and indicators -** Converting the program idea into objectives, and indicators;
- **M&E Planning -** A practical plan on how monitoring and evaluation of the objectives and indicators are to take place;
- **Baseline Study -** Measuring the initial indicators prior to launching the study;
- **Mid-term evaluation and reviews -** Data gathered to feedback on project implementation and progress;
- **Final Evaluation -** Assessing whether or not the program achieved its outcomes and indicators; and
- **Dissemination of results -** Informs ongoing programs and lessons learned.

According to the above criteria, a needs assessment is the starting point for all resultant activities. Needs Analysis is often confused with program evaluation, whereas in fact, it forms part of evaluation rather than an evaluation in itself. This mirrors the generic principles of evaluation which will provide for the systematic data collection and empirical decision making needed by the CFC.

2.5. Needs and Priority Assessment

Needs Assessment (hereafter referred to as NA) is a process of obtaining and analysing the present standing and needs of a geographically or otherwise defined population. It aims to explore the

disparity between how things are and how things should be (Rouda & Kusy, 1995). From a service provider perspective, NA assists mental health providers with information regarding the current strengths and service gaps in the local mental health system (National Consumer Support technical Assistance Center, 2001). NA does this by gathering information on issues or service needs within a particular community (often utilising archival data and previous evaluations), and assessing and drawing on the available local resources to alleviate them and bring about overall improvements in both functioning and effectiveness.

Each community is characterised by different needs (normative, felt, expressed and comparative needs) (Jack & Holt, 2007, p.53). Needs change with time and context, which makes NA an ongoing and necessary process in identifying implicit needs. To identify particular health needs, different methodologies are required to be employed to create a holistic and contextualised understanding of health within a particular community. It becomes apparent that an understanding of the demographics of the target community be obtained in order to best identify and meet these needs.

To date no formal NA has been conducted at the CFC and needs are shaped by multiple factors like age, gender, culture, and socio-economic status, which have reasonably changed over the past three decades. Service-user profiles and programs originally designed based on these non-systematically formulated understandings may no longer be relevant to current or future service users. Demographic profiling, service-user analysis and the systematic collection of baseline data becomes imperative in ensuring that needs are met by current and future CFC programs. Despite studies (Mitchell, 2012; Wilford, 2011) having been conducted on the CFC, to date none have gathered and evaluated the baseline data for CFC client demographics, service reach and service-user profiling. This data should be used to inform the launching and subsequent refinement of CFC programs. However, programs are still being implemented without baseline, mid-term, and final outcome measures. A monitoring and evaluation component is vital, and yet lacking, in up-scaling and measuring the efficiency and efficacy of CFC programs. The need for an evaluation of the current standing and future implementation of CFC programs has become apparent and imperative. This study will not conduct a needs analysis nor a program evaluation, but will form the foundation for future program evaluations.

2.6.   What is Program Evaluation?

Kirsh et al. (2005) define program evaluation as "…a set of processes internal to the program or agency, which may be tied to both quality assurance and program development…" (Rush, Norman & Wolfson, 2003, in Kirsh et al., 2005, p. 234. Smith (2006) defines program evaluation as "…the systematic exploration and judgment of working processes, experiences and outcomes. It pays special attention to aims, values, perceptions, needs and resources…" (Smith, 2006). These definitions reveal that evaluation is a systematic methodological investigation of information that has been gathered and sorted. It goes beyond merely monitoring, to include making judgments on multiple levels about the value, significance, and meaning of data, which is no easy task (Smith, 2006). Program evaluation involves the careful and systematic collection of information about a

program, or some aspect of a program, in order to inform decisions about the program itself (McNamara, 2007). Program evaluation facilitates comparisons between programs, picking out those programs that are most cost effective and allows for these programs to be described in a manner that they can be utilised elsewhere (McNamara, 2007). McNamara, (2007) suggests that programs be thought of as inputs (resources necessary to run the program), processes (how the program is carried out i.e. counselling clients, providing training to Interns and M1's), outputs (numbers of clients served, M1's and Interns trained) and outcomes (the impact of counselling and training, i.e. increased mental health, trained and skilled psychologists etc.).

A program defines the overall goals from a mission statement, and needs to reach these goals in order to ensure that the mission is accomplished (McNamara, 2007). The CFC's goals are to (Killian pers comm., 2009):

- Provide mental health services to marginalised families, individuals and the community;
- Serve as a training site for interns and first year masters students; and lastly
- To facilitate research

These goals inform the programs the CFC develops and implements. As previously mentioned, no formal program evaluation has taken place. These programs must be evaluated to assess whether or not they are achieving these ends (McNamara, 2007). To do this, a Program Evaluation utilising baseline data and service user analysis is imperative.

To date, two dominant types of evaluation have populated the evaluative field. These are Scriven's conceptions of formative and summative evaluation referred to previously (Scriven, 1991). Formative evaluation refers to an evaluation commencing in the early developmental phase or the improvement of a program and is most likely conducted more than once (Marsh & Craven, 1991). Weston, McApine & Bordonaro (1995) argue that formative evaluation validates and improves aspects of a program to ensure its goals are met, and in so doing strengthens and improves the program. Formative methods of evaluation include needs and evaluability assessments; structured conceptualisations, implementation evaluations and process evaluations (Trochim, 2006).

Summative evaluation on the other hand serves to provide information regarding the program's efficacy, i.e. achieving the outcomes it intended to achieve and impact. Summative evaluation is concerned with the outcome of a program, i.e. they summarise the outcomes of a program by describing what occurred subsequent to implementation (Trochim, 2006). There are several sub-types of summative evaluation, which include (Trochim, 2006, p. 3): Outcome and impact evaluations; cost-effectiveness or cost-benefit analysis; secondary analysis; and meta-analysis.

Scriven (1991) argues that formative evaluation should be undertaken with the intention of stimulating summative evaluation. Patton (1996) counter argues by saying that not all formative evaluation is conducted with the intention of motivating summative evaluation. Chen (1996) on the other hand

argues that they are specific to particular circumstances and neither are preferable without considering the context within which the evaluation occurs. This mirrors the notion that the formative/summative distinction is ultimately contextually dependent.

Program evaluation has shifted from a positivist, objective assessment evaluated in terms of how well programs meet their intended goals to a more process-orientated approach which attempts to understand why programs work in the way they do (McEvoy & Richards, 2002). This shift marks the recognition that summative and formative evaluation does not exhaust the plethora of evaluation activities as it does not include conceptual, instrumental or developmental evaluation (Chen, 1996). Patton (1996) argues that formative/summative evaluation has limited use in planning interventions. However, a process- and outcome- improvement evaluation was proposed to deal with this critique. The former is aimed at identifying problems inherent in programs and their implementation processes to bring about improvements and the latter assesses the relationship between the program's elements and processes to the overall effectiveness (Chen, 1994; Huey-Tsyh, 1996, pg. 163). The ability to understand the theoretical rationale or the "why" and "how" of a theory allows service-providers to make evidence-based decisions about how to adjust a program accordingly (McEvoy & Richards, 2003).

There have been conceptual difficulties regarding the "problem of internal synthesis" as Scriven (1996, pg.155) argues "…inferring from the merit of components…to the merit of whole programs…[is]a complex undertaking". Chen (1996) argues that the key to obtaining program theory requires that the evaluator works closely with identified key stakeholders to when forming key assumptions about the program (ibid). Despite these divergent views, evaluation should ultimately be conducted for both formative and summative purposes, with the intention of measuring performance and bringing about improvements (Chen, 1996). Scriven (in Chen, 1996, pg. 164) advocates that evaluation is the "…judgment of merit or worth…", whereas Patton argues that the evaluative scope exceeds this narrow definition to include developmental evaluation, which is ongoing. Chen (1996) argues evaluation results in systematic improvements guided by a conceptual framework which defines validity criteria for making judgments and identifying program strengths and weaknesses, which yield logically defensible outcomes (ibid). Despite the divergent views on evaluation, evaluation serves a distinctive purpose and does so at particular points in time with implications for the methodological changes that need to occur in order for the program to be considered a success.

Program evaluation is a useful framework for the broader process of the review and planning for the CFC and if fully implemented will help to understand and improve the services provided and ensure that the services are beneficial. This is known as 'outcome' evaluation. The present study lays part of the data foundation for program evaluation focusing on an analysis of service users. Outcome as used here refers to benefits incurred by clients through program participation (McNamara, 2007). It also helps to ensure that services are efficient both in cost as well as fit the clients' current needs i.e. are the correct programs being implemented to meet clients' and training needs (McNamara, 2007).

2.7.   How to conduct a Program Evaluation

Guidelines for method selection, and conducting a programme evaluation (McNamara, 2007)

- Needs to yield information relevant to the intended outcomes i.e. reviewing records would allow us to explore the data and gain a comprehensive historical account of the CFC service user profiles;
- Low cost and practical i.e. database creation and record entry done a minimal cost;
- Accuracy i.e. direct entry of records, independent of bias and subjective interpretation, straight facts as recorded in case file;
- Yield all necessary information? If not, what additional methods need to be employed? i.e. exploration of data, which will be used to determine further investigations;
- Is information credible? Temporal bias is possible and will be present in CFC records;
- Who will be able to administer methods, is training required? Training for data entry will be arranged accordingly; and
- In what way can the information be analysed?

As per review of method selection above, this study will utilise a record review. Existing records are useful in evaluating program activities. They are relatively inexpensive to access and can be useful in determining how to record information if it is not entirely suitable for the purposes of the evaluation. Record reviews are useful in revealing behaviour, satisfaction, knowledge, skills, attitudes, beliefs or events (Arch National Resource Center, 1992). To this end, this study involves actively capturing and reviewing client records; analysing demographics; assessing the extent to which the target population has been reached. The information gathered exploratively, using the retrospective record review, will be used to inform future formative program evaluations by collecting baseline data. The usual occurrence upon program implementation is that the manner in which it runs is dissimilar to what was originally planned. The proposed program evaluation will help the CFC ascertain whether its programs are in fact being run as originally intended. Evaluation will also assist the CFC's strategy to optimally achieve outcomes by critically informing training and outreach by critically assessing programs that are currently running and their relative success. Further, one of the upcoming foci of the CFC is to increase its research capacity and develop methodologies and tools for community engagement. Collecting baseline data to inform future programme evaluations will be instrumental in realising this focus. Not only will it yield data to make informed decisions, it will force decision makers to think analytically about their programs enabling goal achievement (McNamara, 2007).   As indicated, this study will not conduct a program evaluation, however will collect the baseline data, and form the foundation of future program evaluations, and give guidance as to the form thereof.

Empirically-informed feedback to inform decisions is a major generic goal of evaluation. In addition Chen highlights the importance of considering context when conducting an evaluation (Porter, 2001; Porter & Ryan, 1996; Wainwright, 1997). The contextualised understanding of needs as highlighted above evokes a particular ontological requirement when grappling with evaluation. This type of evaluation is known as critical realist evaluation.

2.8.   Critical Realist Evaluation

Critical realism originated as an alternative to traditional positivistic, postmodern and constructivist approaches to understanding social phenomena (Bhaskar, 1989). There are three domains in Critical realism (Carlsson, 2005):

- **The domain of the real –** underlying structures, experiences, relations, events and behaviour, generative mechanisms which exist independently of, but have the potential to produce patterns of events. The relations between these various structures generate behaviors in the social domain;
- **The domain of the actual –** the domain in which events and behaviours actually occur; and
- **The domain of the empirical –** what we experience.

Critical realist ontology assumes that reality exists populated by ontological domains in an open social system. Each component within this social realm is highly internally connected. The structures within the open system both depend on human agency and in turn causally affect it (Austen & Jefferson, 2006).

Human action and social organisation is stratified and consists of both macro (structural and institutional) and micro (behaviour and interaction) phenomena. Attention is given to the context (culture, economic status, gender); setting (immediate environment of social activity); situated activity (face-to-face interactions) and self (social involvements) (Carlsson, 2005). These layers require that the evaluation employ multiple methodologies (Mingers, 2001). It captures the process-orientation of evaluation through a context-mechanism-outcome pattern identification with the goal of generating hypotheses about what it is about the program which will work for whom and under what conditions (Carlsson, 2005). In other words, there is no set manner to performing the research, as long as the end product contains a theory about the mechanisms, context and outcomes related to a particular phenomenon. As such, CFC diagnosed mental disorders, and referral problem analysis will be perceived as events causally connected to both time and space (ibid). The reason for this is that the generative mechanisms of disorders are contextually dependent. Further, reality is stratified (biological, structural constraints, cultural attitudes towards disability) making disorders a dialectically emergent entity between the body and society (Williams, 2003, McEvoy & Richards, 2002).

This dichotomy between agency (body) and structural approaches (society) are perceived to be interdependent and temporally related. In other words, society enables people to act, but also places limits on those actions. Behaviour is not exclusively inspired by social structures, as human agents are able to transform social structures through creative action. This ideology contrasts with traditional positivist stances which view people as individual entities operating within a closed system. Therefore marking a shift in methodologies attempting to study all variables bearing on a phenomenon to one where observed differences, or contrasting phenomena be used to generate explanations to account for those discrepancies (ibid). This interdependent relationship is temporally related as history filtrates

into the present shaping structural conditions, and therefore the interplay between people and their social worlds. It becomes necessary to consider theory when understanding causality, and to obtain insight into the 'black box' of the program to determine how and why the program is working as it is (ibid). This captures the trend towards process-orientated evaluation that supersedes the formative/summative dichotomy previously mentioned.

Critical realism does not adopt any particular methodology; instead, it emphasises the importance of how a particular methodology has been employed. A critical realist program evaluation is necessary to appreciate human action as a function of events specific to a defined time and space, imbued by history and which is ever-changing. Geographic Information Systems (hereafter referred to as GIS) have attempted to grapple with the complexity of understanding human activities and have proven useful in modelling and exploring complex interactions amongst numerous variables. GIS has allowed users to appreciate this relationship in manners more complex than traditional linear approaches. GIS is defined as "an integrated collection of computer software and data used to view and manage information about geographic places, analyze spatial relationships, and model spatial processes" (Wade & Sommer, 2006, p. 90). Consequently, GIS will be employed as one of several methodologies to conduct this evaluation. It is suited to the principles of the critical realist paradigm as it captures the time-space continuum of human activity and the complex interrelations amongst humans and their environment (Kwan, 2006).

Curtis, Southall, Congdon & Dodgeon, (2004) conducted a longitudinal study of the association between health variation, area, social and economic conditions between 1920 – 1970, and found that socio-economic factors related to or stemming from government districts strongly influenced an individual's health and mortality. This relationship between humans and their environment to create health disparities is covered by a theoretical framework known as human ecology.

2.9. Human Ecology

Human ecology focuses on revealing temporal patterns of disease in relation to space to include how humans interact with their environments (Mujica, 2007, p. 17; Steiner & Nauser, 1993; Dangana & Tropp, 1995; Meade & Earickson, 2000). In other words, the human ecology of disease concerns itself with how people change their environments to best fit their needs, and in so doing, they disturb the natural state of their environment causing increased susceptibility of exposure to disease vectors (Haddock, 1979).

Ecological designs study geographical variations in phenomena (Moon, Subramanian, Jones, Duncan & Twigg, 2007). The unit of analysis is a defined geographical area or organisational entity, rather than individuals themselves. Ecological subject matter has focused on mortality, morbidity, health-related behaviour and health services in general through systematically collected data (Moon *et al.*, 2007, p. 267). Through 'associative analysis', ecological studies are able to determine underlying factors and how these factors may be revealed through the use of maps (ibid).

Associative analysis is seeks to reveal variables predicting aerial outcomes. However, if place alone accounts for variations in health outcomes, then the answer to this question would be 'yes'. However, "..ecological research is unable to answer such questions because …it has conflated the genuinely ecological and the 'aggregate'…" (Moon *et al.*, 2007, p. 270). The majority of ecological studies analyse aggregate data making the effect of area ambiguous. It becomes particularly problematic when assessing the difference that place makes to what is in the place. No relationship that exists on an aggregate level can be inferred to exist on an individual level (Robinson, 1950, in Moon *et al*, 2007).

This Ecological fallacy resulted in a focus on the individual level. However, in doing this, the effect of area is lost as it ignores the contextual nature of action (Moon *et al.,* 2007). Recent trends have thus implicated the social environment (Moon *et al.,* 2007, p. 267; Townsend et al. 1988, Acheson, 1998, Shaw et al, 1999), and the Socio-ecological model was born.

2.10.   The socio-ecological model

Ecology refers to the study of the relationship between living organisms and their environment. In the 1950's and 1960's this was extended to include human communities and their environments, as reflected in the disciplines of sociology, psychology and public health. As such, social ecology, emerging in the 1970's focuses primarily on social, institutional and cultural context, alternatively, the interaction between humans and their physical environment (White, 1981; Kearns, 1993; Kearns, 1994). Once again place takes on a significant meaning as it becomes "…the stage for the interaction of both the physical and social environment, thus making possible a holistic examination of health…" (Mujica, 2007, p. 9). Here, the environment is not only unique in influencing health, but so too are personal attributes. The two interplay dynamically to create health disparities.

Health research remains dominated by definable risk factors when shaping policy, and as such, places emphasis on prevention. The focus on prevention as the guiding factor in research, as opposed to waiting for the disease to become evident, highlights the importance of place. The focus exceeded cultural perspectives of health to include the identification of environmental causes of disease placing populations at risk (Mujica, 2007, p. 10). This irrevocably implicates context and environment when trying to understand health outcomes.

Any attempt to generate an accurate health profile of CFC users over the past three decades would require mindfulness of temporal diagnostic trends that may potentially distort the retrospective understanding of disorders amongst CFC users. The temporal aspects of need and health outcomes have best been captured and understood through demographic research techniques.

2.11. Demography

Demography is defined as the "…science of a population…" (Weeks, 2002, p.4); or "…the study of population processes and characteristics..." (Rowland, 2003, p.16). Processes here refer to growth, fertility, mortality, migration and aging, and the characteristics include age, sex, birthplace, family structures, health education and occupation.

Demography aims to identify patterns, and explain developments, with the ultimate goal of predicting them (Rowland, 2002, p. 16). Demographic research is therefore optimally situated to interpret changes and using this knowledge of temporal patterns, to make predictions and inform decision making.

When making sense of demographic data one needs to consider its: (Rowland, 2003, p. 36)
- **Relevance –** what is the theme/hypothesis data is intended to address?
- **Reliability –** quality of the information source;
- **Conceptual framework –** Does data belong within an existing theoretical framework, which might clarify the nature and significance of the statistics?
- **Comparison –** Are figures high or low compared with those for other places and other periods of time? Why are they convergent or divergent?
- **Immediate causes –** Any information regarding population change to assess the relative contribution of natural increase and net migration?
- **Underlying causes –** Does background reading and insight into immediate causes of change provide critical insight into underlying, economic, political, social and environmental changes?
- **Consequences –** Do observed changes contribute to changes in the nature and composition of the population under scrutiny?
- **Implications –** Do identified issues need to be addressed through policies and initiatives?
- **Prospective developments –** What are the predicted courses of change in the near and distant future? Will prospective developments improve this foreseeable course of outcome?

In this study, these principles will be used to guide:
- Our understanding of the data collected from the records reviewed
- Understand trends and temporal changes in the data;
- Make predictions using retrospective trends;
- Inform future program development and implementation; and
- Make informed decisions regarding what should be done about predicted outcomes.

Demography is a sub-field of Health Geography (previously known as Medical Geography). Medical Geography is concerned with the effects of place (Mujica, 2007). Cultural, political and economic factors form part of our environment, and as such, offer us important insights into health disparities (ibid). Furthermore, these factors can be said to construct spatial variation in social vulnerability,

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making the persons environment an important factor impacting either directly or indirectly on their health (Eyles *et al.*,1993; Evans *et al.*, 1993; Curtis *et al.*, Mujica, 2007, Haddock, 1979). Medical Geography therefore studies these geographic patterns of disease and health (Oppong, 2005, p.2). Due to the rapidly growing problems associated with increasing infectious and degenerating diseases throughout the world – the need for medical geography has become imperative (Oppong, 2005).

However, human ecology, other than proving to be a useful tool for identifying where people with mental illnesses live, and information relating to the facilities servicing them, have suffered multiple shortcomings in the realm of understanding mental health. It is argued that this is because ecological studies only utilise data on service use (often using in-patient statistics) (Scobie, 1989). This has implications for morbidity. Furthermore, ecological studies tend to focus more on major psychological disorders, rather than the geographical distribution of the less severe ones (Jones, 2001). This invokes the need for a more systematic study of the spatial variation of disease with reference to the environment, and this in turn invokes the field of Medical Geography.

2.12.   Medical and Health Geography

Medical Geography surfaced in 1952, defined as the "study of geographical factors concerned with the cause and effect of health and disease" (Nepal, 1998, p. 48). Subsequently, Medical Geography has surpassed merely observing spatial patterns. It now includes the exploration of the interrelationship between epidemiological, demographic, spatial, economic, political and spatial relationships underpinning mental health outcomes (Jones, 2001). This means, analyses of why people change psychological services or why and how geographical variations in service provision exist.

Paper maps have now become digitised through Geographic Information Systems (hereafter referred to as "GIS") that have taken spatial analysis to a higher level by including hypothesis testing, multi-level modelling and multi-variate analysis (Oppong, 2005). Geographical Epidemiology has created bountiful insights into geographic patterns of disease, risk, and mode of transmission throughout the world (Oppong, 2005). Medical geography bridges the gap between biomedical and social sciences, and in combination with GIS is highly beneficial in understanding disease control. GIS has been said to "…provide a digital lens for exploring the dynamic connections between people, their health and well-being, and changing physical and social environments…" (Oppong, 2005, p. 3). This is consistent with the ontological concerns of Critical Realist evaluations and the need to consider context when understanding health disparities, and outcomes.

Subsequently, the Geography of Health model emerged as the primary focus as the bio-medical model gave way to a more social model. This implicates place as a framework in order to understand health, socio-cultural theory and the political context within which research occurs.

In 1994 when Robert Kearns emphasised the need for considering the effect that place had on health. This shifted the focus to prevention rather than treatment-orientation, characteristic of medical geographic work (ibid). Due to the recognised and indisputable social nature of medicine and health, the proposed shift placed medical geography within social geography (Kearns, 1994, p. 111). Mayer & Meade (1994) criticised Kearns by saying that he failed to acknowledge disease ecology which concerns itself with social, economic, behavioural, cultural environmental and biological factors, that contribute to and create geographically defined disease specific to a particular time (Mayer & Meade, 1994, p. 103). Humans interact with these factors to create their own vulnerability to risk (Mujica, 2007). Therefore, health inequalities occur as a result of social determinants. These include those "…conditions which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power, and resources at global, national and local levels, which are themselves influenced by policy choices" (WHO, 2013).

The literature has failed to fully account for why health inequalities exist in the same geographically defined place. Health inequalities are said to be associated with biological variations (Hayes, 1999); occupation and income (tied to housing, education, Medical Aid); access to healthcare; as well as the differential impact of place and space on health (House, 2002). This notion therefore denotes, before we can appreciate human action and if mental health correlates, we need to better understand the effects of place.

2.13.   What is place?

Place refers to more than a cartographic representation and spatial analysis. It refers to a conceptual research approach to understanding the spatial structure of disease and emphasises the importance of context (Mujica, 2007, p. 6). Place refers to the interaction between natural settings. It involves behaviours and images specific to that natural setting and is important in understanding an individual's health (Richardson 2004; Mujica, 2007; Jones & Moon, 1993; Kearns & Joseph, 1993; McIntyre et al., 1993; Dyck, 1999; Elliott, 1999; Kearns & Moon, 2002; Andrews & Kearns; 2005). As such, place is crucial in identifying, understanding and preventing disease.

Geographers have come to perceive place in two different manners (Mujica, 2007, p. 16-17):
- **Place as a locality** – Refers to how communities respond to health threats. It also involves the restructuring of health programs in rural and urban areas according to researcher understanding of localities by looking at physical and human geography and perceptions of health; and
- **Place as represented in cultural landscapes** – Health needs to be understood with reference to culture and the role it plays in health and the transmission of diseases (Dyck *et al.*, 2005; Williams, 1999; Gesler, 1992). It also includes the manner in which cultures view despair and institutionalisation (Dear & Wolch, 1987; Parr, 1997).

This means that context is vitally important when trying to understand health and health outcomes. The interplay between health outcomes and place are said to be due to the (Moon *et al.*, 2007, p. 273):

- **Physical environment –** commonality of features in the environment to which all people within a particular region are exposed;
- **Cultural milieu –** people and place are in a "…recursive dialectic relationship"; in other words, people create structures in a particular place and those structures then sculpt the very people who made them. People both as individuals and as a community create local cultures which are influenced or shaped by their everyday routines. The local culture in turn teaches people how to interpret and respond (Moon, Subramanian, Jones, Duncan & Twigg, 2007, p. 273);
- **People and Place deprivation –** the former refers to the manner in which people's position in the socio-economic system deprives them. The latter refers to poor access to specific goods and services in specific locations;
- **Selective mobility –** the interrelation between individual mobility and area effects of government policy enable some and disable others and some places seem more desirable than others as a result. These interactions cause area-specific health differences for particular groups. This is similar to Access previously referred to.

These features highlight how context is important, not only geographically, but also when considering the temporal (time periods), administrative (health administration areas) and institutional (hospital or clinic) aspects of society. The latter two are used as health performance indicators (Moon *et al.*, 2007). Contextual, cultural, political and economic factors all form part of our environment, and as such, offer us important insights into health disparities (ibid). These factors can be said to construct spatial variation in social vulnerability, making the person's environment an important factor impacting either directly or indirectly on their health (Eyles et al.,1993; Evans et al., 1993; Curtis et al., Mujica, 2007, Haddock, 1979). The temporal and contextual character of health has been referred to continuously throughout this proposal. It was further highlighted in the review of critical realism and can not only be seen to strongly influence health outcomes, but also the prevailing diagnostic culture relevant to that time. Further, area can be characterised by multiple deprivation indicators and are useful in indicating which areas are most deprived. It may be used to develop summary indices which correlate highly with predictors of morbidity and mortality (Stafford, Cummins, Macintyre, Ellaway, & Marmot, 2004).

2.14. Deprivation Indicators

Deprived areas are characterised by elevated rates of poor health and mortality (Pickett & Pearl, 2001; Curtis & Rees-Jones, 1998). Typical examples of deprivation indicators include: restricted access to a vehicle; unemployment; employment as a manual worker; over-crowding; and not owning

a home (Townshend, Phillamore, & Beattie, 1988). Stafford, Cummins, Macintyre, Ellaway, & Marmot, (2004) found that health varied according to sex, age, socio-economic status (hereinafter referred to SES) and gender. The problem is the inability to identify those factors in the residential environment that play a vital role in health (Stafford *et al.*, 2004).

Health or medical geographers have the unique ability to consider the combination of physical, biotic, and cultural aspects of life that are so intimately bound up with disease transmission in and across communities. These community specific characteristics intimately shape the needs experienced by people within a defined population (Mujica, 2007; Burke, 2004; Kagee, 2005; Somnier & Genefke, 1986; Simpson, 1993; Pillay, 2000; Green *et al.*, 1990). Within the social context of medical geography, there is an even smaller sub-discipline, called social geography.

2.15. Social Geography

Social Geography refers to (Parr & Boyd, 2008):
- Rural Geography
- Mental Health Geography
- The Social Geographies of Caring

Rural Geography refers to understanding the social construction of meaning of people within rural environments, with the intention of understanding life within rural contexts. In the 1990's, Mental Health Geography was characterised by two waves (ibid). The first wave concerned itself with movements of those mentally ill in the post-asylum era. The second wave with the manner in which people considered mentally "abnormal" deal with, and are in turn dealt with by society, i.e. issues of stigma and social exclusion. The last aspect of social geography concerns itself with the Social Geographies of Caring. This sub-field of mental health geography highlights how most mental health research to date has taken place in urban contexts. This study will focus primarily on the Geography of Mental Health itself.

2.16. The Geography of Mental Health

This sub-division of Geography is at the cross-roads of social and medical geography. The former refers to the spatial structures underlying social relations (Jones, 2001). As mentioned previously, the shortcoming of ecological studies has led to the inclusion of social and spatial processes, the geographical positioning of people with mental illnesses and their service providers.

This study poses the question as to whether there is something specific to space, place and context that leads to mental health disparities throughout the Msunduzi District. If so, how can the CFC identify these differential needs of communities in an effort to best place programs to maximize mental health benefits at a minimised cost. The severe shortage of mental health facilities has been mentioned. The lack of prioritising mental over physical health makes institutions such as the CFC

pivotal in ensuring the mental health needs of marginalised populations are met. In this study, this refers to those people attending the Pietermaritzburg Child and Family Centre. The CFC is situated in the heart of the PMB CBD, within the Msunduzi Municipality. What will follow is an overview of this study area to contextualise findings.

2.17.   The Msunduzi Region
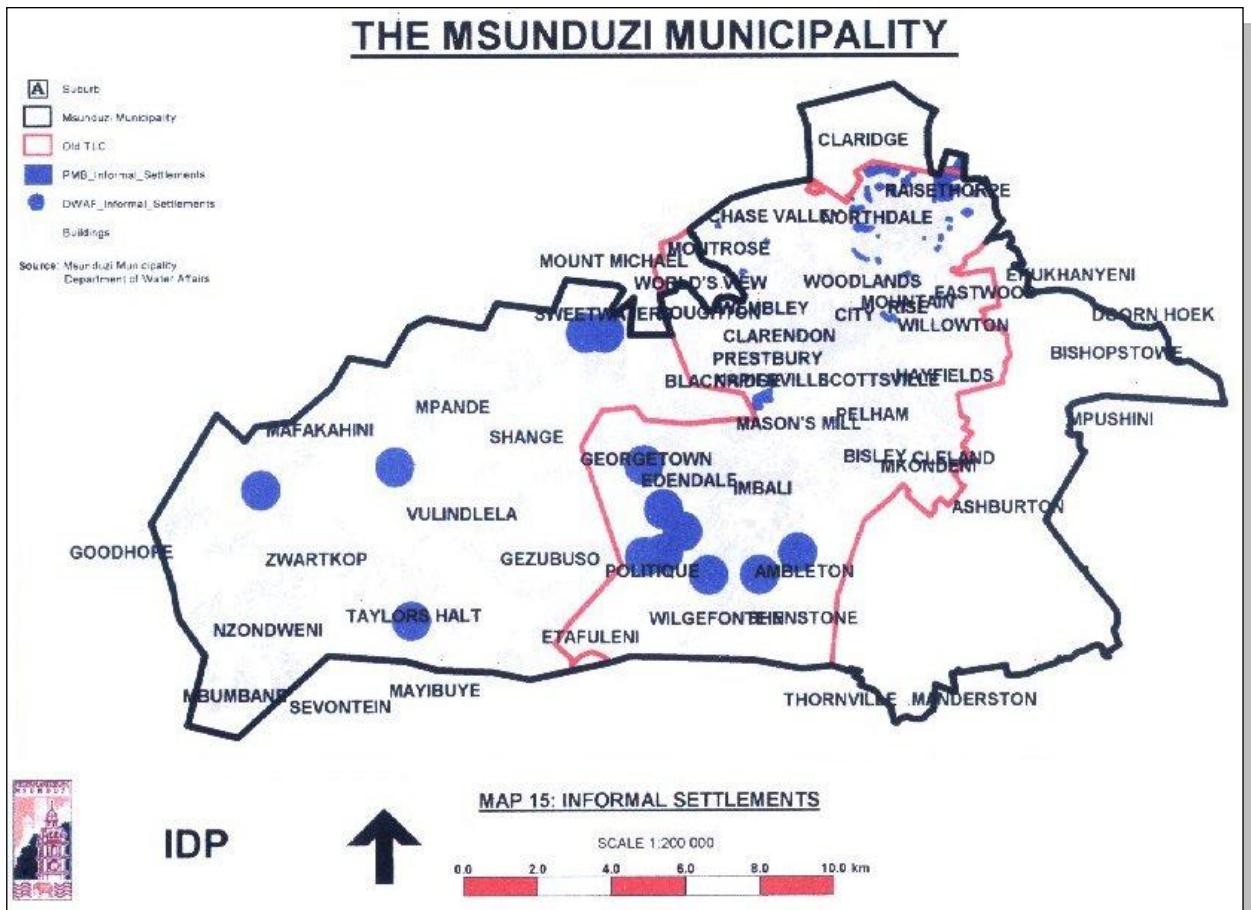
Figure 2.2. A map of the Msunduzi Municipality indicating informal settlements and the old TLC

The Msunduzi Municipal region is spread over a large area and has double the population of Pietermaritzburg. Pietermaritzburg is the second largest urban center in KZN, and is close to major forms of transport, including freeways, railways, and ports (Msunduzi Municipality, 2009). The population as of 2011 equalled 618 536. It has a dense public transport network, as areas on the outskirts of a city are generally cheaper to live in (Epprecht, 2006). 81.1% of the total population are Black, 9.8% Indian/Asian, 6% White, 2.9% Coloured, and 0.3% other. According to the Msunduzi SDF Review in July 2009, The CBD, Ashburton and Eastern PMB are largely dominated by residential areas. Some of the biggest employers are situated in these areas and therefore the largest economic contributor to the city. There is a high concentration of schools in the central area and it has an airport and a railway station. The North- and South- eastern parts contain pockets of cultivated land.

The Northern areas of Msunduzi are dominated by residences (formal and informal), with a few plantations in the North Western areas. The largest commercial and industrial activities take place in this area. A nature Reserve (Queen Elizabeth Park) and the city's largest health facilities (Greys Hospital and Townhill Psychiatric Hospital) are located within this area.

The Edendale area, South East of the CBD, is largely residential and largely underserviced. This area, as mentioned by Dyer (2012) previously, was historically reserved for Black people. Settlements here range from formal and informal to traditional. The socio-economic status of this area is very low, and the residents largely unemployed and poor. Edendale, Dambuza, Slangspreit, Sinathingi, Willowfontein and Emantharen are particularly poorly serviced.

Vulindlela, the last sub-area to be included under the Msunduzi District, is under traditional leadership and is largely rural with pockets of informal settlements. This area constitutes the largest proportion of the city's population, and yet, is the most underdeveloped and under serviced. Here, the majority of the residents are unemployed and receive grants from the government.

There have been recent developments in housing, most notably in Imbali, Bisley, Pelham, Boughton, Cascades, Cleland and Chase Valley. Sixty nine percent of the Msunduzi population has never been married, 22% are married, and 4.5% are living together as married partners. Of the Msunduzi population, 2.3% have no schooling, 36.6% have partial primary school education, 31.1% have some secondary education and only 18.6% have matriculated. The dependency ratio is slightly above 46% (Stats SA, 2011). In terms of dwellings, 75.4% occupy urban dwellings, 24% Tribal/Traditional, and 0.6% live on a farm (Stats SA, 2011). Of these, only 58% occupy formal residential houses. A further 16.1% of the Msunduzi population earns no income, with 17.9% being unemployed, and 39.7% being economically inactive (ibid).

Epprecht (2006) recognises the importance of place on health and development, and the impact that historical geography has on understanding the limitations on development and economic growth. With the lifting of Apartheid and its influx control policies, there was a steep growth of informal settlements around the PMB city (Dyer, 2012). This meant that houses mainly consisted of wattle, daub, corrugated iron and plastic due to poor income into the areas, and lack of government attention. Coloured and Asian individuals largely populated these areas. There was also an increase in children roaming the streets. Due to policies dating back to 1922 enforcing separate growth and development, other than White individuals were forced to live in the outskirts of PMB. Edendale, Imbali, Ashdown and Plessislaer were mainly populated by Black individuals who were subjected to poor sanitation, use of pit latrines, inadequate water and uncontrolled housing (ibid). Scottsville and the major suburbs of central Pietermaritzburg were mainly populated by White individuals. Under the Group Areas Act, Asians were confined to Northdale and Mountain Rise. Coloureds were confined to Woodlands. Due to the racial segregation and legislation of the time, up to 60% of Black individuals

resided with their employers, without their families, 10% in same-sex hostels, and the remainder in Edendale and Sobantu, where numbers were in excess of 11 people per house, and Imbali, where there were roughly 6.5 per house (Dyer, 2012). There was no development in the Edendale area between 1974 and 1994. The 1980's were marked by increasing levels of violence as a culmination of Bantu education, unemployment, lack of job opportunities, poverty, overcrowding, migrant labour. This violence led to the relocation of Black people to traditionally Asian and Coloured areas. In September 1987 floods exacerbated the already volatile situation as mud and daub houses in Edendale and Vulindlela washed away. Roughly 397 people were killed violently in 1987 around the Edendale, Vulindlela, Slangspruit and Ashdown areas. In 1988, it was estimated that around 51 people were killed per month in these areas. This violence peaked in 1990. Not only were residents physically afflicted, but psychologically too. The effects of the 7 day war continued to be felt well up into 1996, where up to 20 000 people had fled their homes and residence patterns remained severely disrupted. The prevalence of anger, grief and depression soared (Dyer, 2012).

There was marked breakdown in familial structures as most Black females were live-in domestic servants and the Black males largely left home to search for work in towns. This meant that children were often left in the care of relatives and carers (ibid). A Black female's income in 1981 averaged R55 per month. Vulindlela, a traditional and largely agricultural area, was only incorporated into Msunduzi in 2000. This meant that it was largely exempt from all of the developmental benefits from government RDP plans post-apartheid. There was also marked difficulty in developing Edendale after 20 odd years of neglect, as land ownership post-apartheid was difficult to determine as income could not be generated from rates. In 1995, floods hit the KwaPata, Slangspruit, Imbali, Azalea and Willowfontein areas, resulting in over 200 deaths, the complete devastation of infrastructure and gutting of hundreds of roads (Dyer, 2012). Temporary structures were constructed while homes were rebuilt.

In essence, the previously "non-White" areas were poorly invested in and poorly developed. This resulted in a poor quality of life for residents in these areas (Epprecht, 2006). Physical well-being has an impact on psychological well-being. As demonstrated above, Black individuals have experienced a marked history of harsh living and working conditions, lack of familial structure and support, lack of adequate education and opportunity, and, amongst others, a history fraught with violence and hardship. The historical effects of Apartheid are still eminent today. Crime Statistics SA (2013) reported for 2013 that Plessislaer is one of the ten worst precincts of crime, sexual crime, intent to inflict grievous bodily harm, assault, drug-related crime, *crimen injuria*, and murder in KZN in 2013. Mountain Rise was reported to fall in the top ten for common assault, *crimen injuria*, drug-related crime, negligence and ill-treatment of children and malicious damage to property in 2013. Pietermaritzburg was reported to be in the top ten worst precincts for negligent and ill-treatment of children, common robbery, robbery with aggravated circumstances and shoplifting in 2013.

The psychological consequences of Apartheid are devastating and the availability of psychological services are for the most part non-existent (Hickson & Kriegler, 1991).

2.18. CFC History

The CFC was founded in the 1970's as a guidance clinic, following a multi-disciplinary approach within the educational psychology department, by Professor Gustav Fouché. Whilst directing the CFC, he established good relations with local mental health services and practitioners (Killian pers. comm., 2007). A long standing tradition of the CFC is the case conferences on a Friday, previously attended by psychological and paediatric registrars, nurses, psychiatric hospital staff and related disciplines (Killian pers. comm., 2007). In 1991 Dr. Bruce Gilmore took over the directorship of the CFC for two years, and maintained all of the objectives upon which the CFC was established. He was replaced by Dr Rose Schoeman in 1993, who remained director until mid-2001. It was around this period that the multi-disciplinary nature of case-conferences had to be abandoned due to bureaucratic reasons.

In early 1999, the restructuring of the University resulted in relocation of the CFC from the Department of Educational Psychology to a small house outside the psychology department. It became part of the School of Psychology, and as such adopted the missions and goals of the School of Psychology and the University of KwaZulu-Natal as a whole. A practice centre was created, the Philani Centre for Psychological Research and Practice. This center comprised of the CFC, and an adult service, and a Community and NGO organisation service focus. Dr. Schoeman's focus was to provide high quality training, and emphasis was placed on community outreach activities, establishing strong relations in the Pietermaritzburg mental health community. Gail Nicholson replaced Dr. Schoeman in mid-2001 as a part-time director (50% of her time was reserved for teaching). She sustained the quality of service provision and community outreach instituted by Dr. Schoeman, and was replaced by Khanyi Nyembezi around the beginning of 2003, who sustained these objectives until Dr Beverley Killian took over in 2007.

Dr. Killian's main focus was to sustain community outreach, implement greater integration with the School of Psychology, and increase the amount of research conducted by the CFC (Killian pers. comm., 2007). From the overview provided, it becomes obvious that different directors have placed emphasis on different elements of the tri-partite goal of the CFC (research, training, and service).

Service, training and research units in tertiary contexts serve a range of important functions. The CFC has addressed three functions variably over its more than thirty year history; 1.) As a training site (accredited by the HPCSA's Professional Board for Psychology as a site for internships for Counselling, Education, and Clinical Psychology) for interns in those three categories; 2.) Community outreach; 3.) Research (UKZN Foundation, 2007).

The recent merger between two major educational institutions in KwaZulu-Natal, the University of Natal and the University of Durban-Westville, has prioritised an institutional identity focusing on African scholarship, "as an institution of higher learning, it is committed to academic excellence, innovation in research and critical engagement with society. With its vision to be the Premier University of African Scholarship, the University of KwaZulu-Natal draws inspiration from an African identity and takes seriously its responsibilities to the development of the African continent" (University of KwaZulu-Natal Homepage, 2007). The School of Psychology has recently merged three departments. It shares a vision of African scholarship and excellence, and seeks to achieve its mission through "critically informed and reflective teaching, research and community responsiveness" (School of Psychology UKZN, 2007). The integration of the CFC into the School of Psychology merged the vision of the CFC with that of the School of Psychology (UKZN Foundation, 2007).

Further, due to the growing diversity and inclusiveness of the student population, there has been increased necessity for higher education to incorporate community-oriented and collaborative programs into leadership models (Bringle, Games & Malloy, 1999 "…to serve the common good and to reinvest in commitments to local and global communities…" (Schneider, 2005 in Gilbert, Kesler, Weispfenning & Kengla, 2007).

2.19.   Service learning in tertiary settings: Contextualising the CFC

Community psychology addresses issues at a group rather than individual level. Individuals do not make up society; rather, selfhood is formed through the various interactions with, and membership to various groups in the community. Projects should be aimed at the community, rather than merely focusing on individuals. Shulman (2006) stated that discovering innovative ways to become involved with communities should be a high priority for tertiary institutions. A university that is involved in community engagement is seen as being "…fully committed to direct, two-way interactions with communities and other external constituencies through the development, exchange, and application of knowledge, information, and expertise for mutual benefit…" (American Association of State Colleges and Universities, [AASCU], 2002, cited in Sandmann, 2007, p. 1). Community engagement draws from service-learning pedagogy, community-based participatory research and public scholarship, as a collective response to social problems confronting communities.

Service-learning projects make a national contribution by allowing young people to engage with the community by using their education to make a difference (LearnandServe America, 2007). Service-learning can be defined as an "academic study linked to community service through structured reflection so that each reinforces the other…the service may address a variety of community needs including direct service to people in need, improvement of community resources, community outreach and education, or policy analysis" (CSU, 2001). Community centers embedded within universities are said to provide valuable models or frameworks detailing how to engage with the community, and detail research agendas to ensure collaborative relationships (Carnegie Foundation, 2006). Not only

do campus-based organisations help strengthen local communities and improve the overall liveability and attractiveness of one's country, but students enhance their education by applying their knowledge and skills acquired at university to problems plaguing the community (CSU, 1997).

To date there has been no systematic assessment of CFC users, and CFC initiatives aimed at meeting the mental health needs of communities. Therefore, the full benefits of CFC programs and agendas have not yet been measured, conceptualised and realised. Therefore, the skills obtained by the youth to assist in and provide novel approaches to deal with, particularly in the Msunduzi Region, its own unique risk and depravation indicators. In a therapeutic context, it is required that the specialists have cultural awareness, and that the mental health profession as a whole reflects the country's demographic characteristics (Burke, 2004). Often lip service is paid to culture, and the personal disposition of the client, which is exempt from an actual understanding of what this entails (Burke, 2004).

The motivating goal of the CFC is to provide a service that addresses problems at a regional, national, and international level in innovative ways, through critically informed and reflective training, research and community responsiveness to "assist with the development of children and families in Africa through relevant teaching, research and community engagement' (UKZN Foundation, 2007). The aims and objectives of the CFC include: (UKZN Foundation, 2007)

- The provision of psychological services to individuals, groups and communities as a whole
- Provide a site of training for masters and intern psychologists (psychology, education)
- To aid the development of theory-driven methodologies and practice models that fit needs of a changing community, and progressive society
- To educate or inform, using workshops, coursework and seminars, those members in the community, professionals and agencies, of the training opportunities, and general principles of applied psychology
- To provide a consultative facility and multi-disciplinary forum for members in the community (stakeholders) and other institutions

The need for mental health services in the country demands that these aims warrant optimal implementation. In order to do this, it is vital that the CFC is aware of the needs of the community, and how best to train future psychologists to best respond to these needs.

The fact that the research leg of CFC is significantly underdeveloped means that programs are being launched with insufficient information needed to understand and profile CFC users. This strategy compromises the utility and effectiveness of these programs. As previously discussed, when attempting to understand health, knowledge of the cultural and socio-political context is imperative in designing programs that fit the needs of particular communities (Weiss, 1999). No program can thus be developed without data upon which to draw focus to those issues affecting that particular community. To date, CFC programs have commenced in the absence of such knowledge.

Baseline data is necessary to achieve an understanding of the contextual and temporal needs of CFC user's at present so as to tailor programs to meet their specific needs and equip the CFC to deal with the challenge of scaling up programs or tailoring them to better meet CFC service user needs.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

This chapter aims to provide the overall rationale and explanation of the research design and methods chosen to achieve the aims of this dissertation. A brief explanation of the methods and techniques used are provided, and motivated for.

3.1. Aims and Objectives

- This study aims to collect baseline data be collected via an electronic database capturing CFC client records over its 36 year history. Archival data, or records, is one of the many techniques employed to perform a Needs Assessment (NA). Although NA is not the focus of this project, the various techniques used and results obtained were used to guide future NA's. This study further aims to extend the research leg of the CFC that has previously been under-developed by exploring, using multiple methodologies, and presenting baseline data using the CFC client records dating back to its establishment in 1975**. This study also** aims to identify temporal trends in referral problems in relation to time, space and place using Geographical Information Systems

3.2. Research Objectives

- To collect and present baseline data from CFC records dating back to its establishment in 1975
- Understand CFC user characteristics in relation to time, space and place using
- Utilise multiple methodologies, including Geographical Information Systems, to explore CFC user data in effort to facilitate future evaluations
- To extend the previously under-developed research leg of the CFC
- To geographically profile CFC users
- Make suggestions and recommendations regarding future Program planning and implementation and evaluation

3.3. Research Questions

- Are there any areas within the Msunduzi Region that are under-serviced?
- Are there any hot-spots within the Msunduzi Municipal area that require focused CFC program intervention?
- Are there any temporal mental health trends?
- Are there definable demographic temporal trends since inception?
- Are there any predominant mental health difficulties experienced per sub-place?
- What are the demographic and service-user profiles per sub-place?

- What are the geographical trends in access and service-uptake at the CFC?
- Are there any geographically definable mental health outcomes?
- Can CFC utilise the baseline data generated from this study to tailor its programs?
- What recommendations can be made?

3.4. Hypotheses

Despite the exploratory nature of this study, a few tentative hypotheses have been generated as per the literature review.

H_o: There has been no change in client demographic as the South African socio-political climate has changed

H_i: There has been a change in client demographic as the South African socio-political climate has changed

H_o: There are no racial changes in CFC clients pre- and post-1994

H_i: There are racial changes in CFC clients pre- and post-1994

H_o: There are no significant differences in the type of presenting problem and level of socio-economic status

H_i: There are significant differences in the type of presenting problem and level of socio-economic status

There are two broad approaches, or ontologies, to conducting research. These include the positivist, and the subjectivist ontology (Saunders, Lewis, & Thornhill, 2009). Ontologically, positivist research assumes that one reality exists, and can be discovered through objective methodologies, by eliminating rival hypotheses or alternative explanations (Mertens, 2005. Epistemologically, the researcher is an objective onlooker, with limited influence on that which he is observing. The method of enquiry utilised is quantitative methodology, through descriptive and inferential statistics (ibid).

Subjectivist research, on the other hand, involves more exploratory techniques of assessing data such as words, pictures, objects to uncover their contextualised meaning (Kumar, 2005). Ontologically, reality is multiple, and meaning and knowledge is socially constructed (Mertens, 2005). Epistemologically, the researcher, and the researched influence each other, making interpretation and understanding contextually bound. Methodologically, subjectivist research is inherently qualitative, and meaning is derived from words, observations, and document reviews, where meaning is contextual and socially constructed (ibid).

The nature of how reality is viewed, and meaning is derived at, underpins the manner in which we come to understand the world around us. This view contains a set of assumptions, and the tools available to us generate and capture this understanding. Embedded within the subjective and

objective ontologies, we find attached to them research paradigms. Ontologies and research paradigms serve the purpose of helping researchers conceptualise how they view reality, and assist people reading that research in coming to understand and make value judgments. There are two general approaches to research, the quantitative and the qualitative, where the former most often associates itself with the positivist ontology and the latter the subjectivist.

This study subscribes to the positivist ontology, adopting quantitative methodologies of data collection, sampling and analysis.

3.5. Types of Research

There are broadly six different types of research:

- **Exploratory -** This type of research investigates an area or issue on which little previous work has been carried out, or where rival explanations not previously thought of are needed. The aim is to look for patterns, ideas or hypotheses, rather than testing or confirming a hypothesis;
- **Speculative -** Implemented strategically, where researchers take account of current situations and speculate as to their future implications;
- **Descriptive -** Gather information that illuminates relationships, patterns and links between variables. Basically, to describe phenomena as they exist;
- **Explanatory -** Goes beyond merely describing characteristics, and aims to show why relationships, patterns and links occur i.e. causality;
- **Predictive -** Develop a model that predicts the likely course of events given particular intervening variables or circumstances; and
- **Evaluative -** To evaluate the impact of something.

This research is essentially descriptive, exploratory and has some explanatory dimensions through the use of spatial analysis, as it aimed to gather information regarding the CFC users, CFC service utilisation, access, reach, and form baseline data to inform future evaluative studies.

3.6. Research Design

Quantitative, positivist research designs include (Saunders, Lewis & Thornhill, 2009):

- **Cross-sectional:** determines prevalence by taking a cross-section of the population. They are useful to create a snapshot of the present status of a problem at that present time;
- **Longitudinal:** conducted over a long period of time. As such, they are useful in determining changes in phenomena over time;
- **Observational:** subjects or objects of interest are observed either directly or indirectly, overtly or covertly;
- **Case Studies:** Reports data on only one subject. Within this category we have case series in which a few cases are considered, and case-control or retrospective; and

- **Experimental:** Largely experimental type studies where data is generated through experimentation (Srivastava & Rego, 2011).

Qualitative, subjectivist research designs usually include:
- **Case Study –** examining a particular phenomenon within its real life context;
- **Grounded theory –** Used in exploratory/descriptive studies to develop and build theory;
- **Ethnographic –** describes and explains the social world within which research subjects are embedded, and describes it in the way that they would describe and explain it. Characterised by immersion; and
- **Phenomenological -** concerned with describing lived experience.

As such, this study followed a longitudinal, retrospective design. A longitudinal design was applicable due to the temporal nature of CFC archival data spanning over the past three decades. In this respect it was retrospective in that it reflected back from this time point in 2013, focusing on developing an understanding of changes in psychological and demographic data since inception of the CFC in 1975.

3.7.   Research Methodology

Research Methodology primarily concerns itself with the method in which sample was drawn; data was collected, and analysed.

3.7.1.   Sampling Methodology

There are two dominant types of sampling methodologies. These are probability and non-probability sampling (Saunders, Lewis & Thornhill, 2009). The former refers to a sampling strategy such that every member of the population has a known, equal chance of being selected (ibid). The latter refers to a method involving a deliberate selection of particular members of the population (ibid). Probability sampling is conducted such that bias and error is minimised. Samples are drawn in a manner which ensures the sample is representative of the broader population. This enables findings to be generalised to, and inferences made about that population (Kumar, 2005). Non-probability sampling methods, on the other hand, are drawn such that in-depth understanding and insight into a phenomenon is obtained. The aim is to understand, rather than to draw inferences and generalise finding to the broader population (ibid).

Probability sampling includes (Saunders, Lewis & Thornhill, 2009):
- **Simple Random Sampling:** Each unit within that population has an equal, known chance of being selected;
- **Systematic:** sample is systematically selected from an ordered sampling frame;
- **Stratified:** division of the entire population into sub-groups or strata, based on a particular attribute, then randomly sampling within each stratum; and

- **Cluster:** sampling exists when there are "natural" and homogenous sub-groups within a population. The sample is divided into groups, known as clusters, and simple random sampling within groups ensues.

Non-Probability sampling techniques include (Saunders, Lewis & Thornhill, 2009):
- **Convenience:** utilises people who are readily available and accessible to participate in the study;
- **Judgment/Purposeful:** utilises knowledge of that population, and the characteristic of interest for selection; and
- **Quota:** researcher chooses sample based on a fixed quota, i.e. one divides the population into mutually exclusive sub-groups. Here units of the population are selected into a sample based on pre-determined characteristics such that the sample is made up of the same proportion of representivity as it would appear in the total population.

The population of CFC users since inception in 1975 is estimated to be well over 4000 records. Since the development of the CFC Database in 2009, 2747 of these records have been captured. A total of 2747 records were present in the CFC database at time of download in January 2013. Records were exported based on criteria:
- Client caregiver demographics (includes geographical points for residence, marital status); and
- Client Demographics (race, age, gender, grade, home language, date of birth, referral problem, school attended, highest qualification, present activity, amount paid per session, number of visits, date of first consultation, and initial consultation with)

Only those records that met the predefined requirements during export were exported into excel for data cleaning. This meant that a total of 1975 records constituted the total sample for this study. A cluster sampling technique for CFC records was followed, year of CFC attendance constituting a cluster. Samples present within each stratum were based on export, as only those records meeting pre-defined criteria were included in the final sample. As such, no random or purposive sampling methodology was explicitly used. Resultant bias and error in sample was therefore not controlled for. Potential bias may have been introduced as only those records meeting the export requirements were included in the final sample.

3.7.2. Data Collection

Client records dating back to inception of the CFC were captured in a database created in Microsoft Access.

3.7.2.1. Database design and development

A database is a collection of information that is related to a specific subject, and can be used to link information that was previously stored in separate locations. Microsoft Access 2003 was used to create a relational database that will in future be used to capture this information. The rationale for

selecting a relational database was that it utilised multiple tables. Each table captured a separate topic, therefore storing data only once, thereby reducing data-entry errors. Tables allowed for relationship analysis ensuring the database served multiple research analytic functions.

3.7.2.2. Creating the Database

A central table detailing client demographics was created in Microsoft Access, and linked, via one-to-many relationships to look-up tables used to create drop-down menus in a form to facilitate easy data entry. Relationships are used to link together information in separate tables using a unique key identifier that matches data in key fields.

This unique identifier is known as a primary key, and was linked to a foreign key in other tables. Key ID's consisted of the first three letters of their surname, followed by the year in which the client file was opened, and then a special number assigned to each client. The below figures illustrate the structure of the database accordingly.
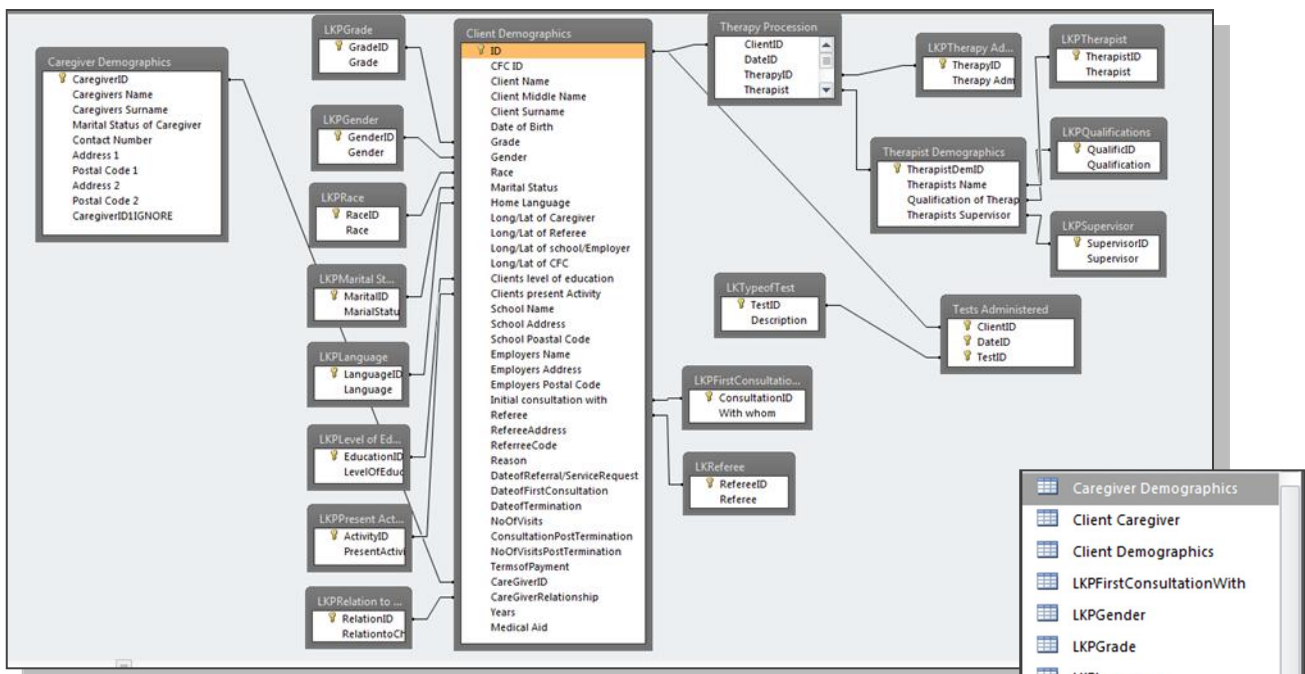
Figure 3.1. The structure of the relational database, illustrating how all tables are linked

Figure 3.3. An example of the main form used to capture data on the CFC database

The relational database, using specialised Key ID's for each client, was a preferred technique in this study as it allowed the use of Structured Query Language (hereafter referred to as "SQL"). SQL is used to run queries, to update, create reports, and manage the database. Tables were also created according to the required fields using queries, and exported to other programs in this instance, IBM SPSS 22 and ArcGIS 10.1.

Forms in databases are used not only to enter, but also display, data in a way that is easy to read, almost serving as an interface between the user and the database. A Form's record source is linked to the fields contained in underlying tables and queries, and is what is linked by controls.

Controls are graphical user interfaces used to manage the program, and consist of text boxes, check boxes, scroll bars and command buttons.
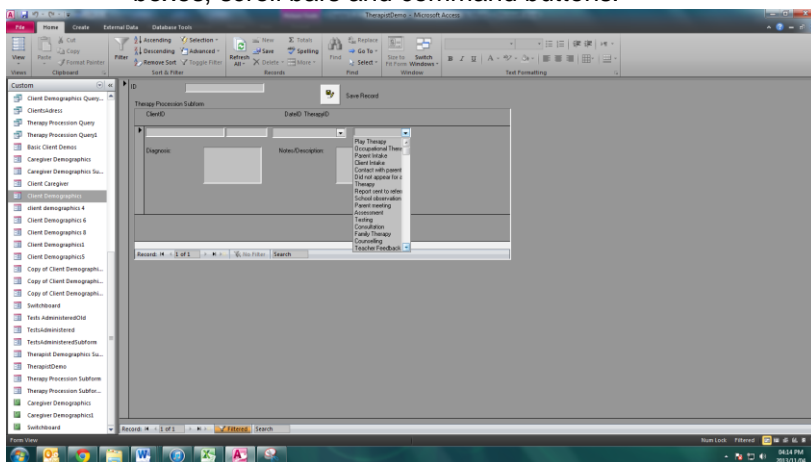
Figure 3.4. The Therapy sub-form
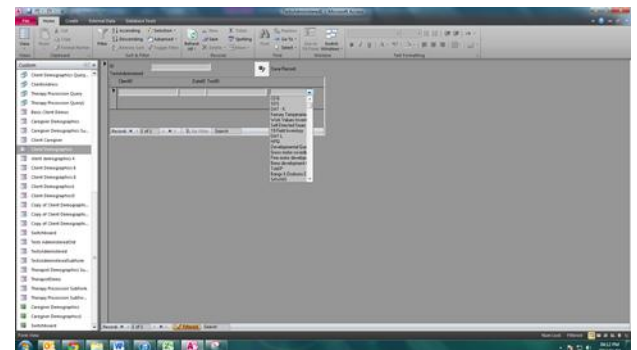
Figure 3.5. The tests administered sub-form

A main form, and sub-forms, were created using the central client demographic table, with buttons that linked to sub-forms for caregiver demographics, therapy/intervention records and tests administered. It was necessary to create sub-forms because they facilitated the capture of multiple entries into one record. For example, multiple tests were administered to one client on numerous occasions, and the main form may not have had sufficient space to capture such information. This also made it easy to run queries using SQL.

A default Switchboard was created that automatically popped up as the database was opened, and provided quick access to certain functions such as opening up a form in add mode, or in edit mode. An auto-calculation of age was created using CFC client's date of birth, calculating the client's current age at time of access.

3.7.3. Data Analysis

3.7.3.1. Data

There are generally two different types of data: primary; and secondary data (Daya, 2011; Saunders, Lewis, & Thornhill, 2009). Primary data refers to that data collected by the researcher for the purpose

of the research. Secondary data is data used by the researcher that has been collected by other researchers (ibid). The benefits of primary data are that the veracity, reliability and credibility with which the data has been collected, analysed and presented can be ascertained. Further, the data has a direct bearing on the research at hand, and errors inherent in the data is easily detected (ibid). The advantages of secondary data is the ease at which it can be obtained, and utilised, however, quality measurements, and specificity to your research cannot be determined.

This study collected secondary data by retrospectively capturing CFC records electronically, upon which primary analysis was done.

3.8. Level of Measurement

The data collected from CFC records existed at a nominal, ordinal and ratio level.

What will follow is an explanation of the various methodologies employed to explore CFC client data.

3.9. IBM SPSS Analysis
3.9.1. Data Sorting

Two different SPSS Databases were created to facilitate multiple statistical tests in exploring CFC data. Data was exported from Microsoft Access to Microsoft Excel as a DBASE IV file. From Excel the data was coded, and codes entered onto SPSS, where data was thereafter exported. Codes for SES were estimated using the amount paid per consultation. The assumption underlying this classification was those CFC clients who paid more than R100 were classified of middle- to high-SES, whereas those clients who paid no fees were of lower SES standing. It should be noted here that reference to middle-high SES denotes to this sample, and not to the broader population. In contrast to the broader population, the amounts paid per consultation indicating a higher SES in this study is in fact minimal by comparison.

The classification of referral problems was based on the DSM, Referral problems did not constitute diagnoses, they were merely reasons for referral of CFC clients. Descriptive analysis was performed on the data. Cross-tabulations were generated and resultant output was exported into another SPSS database to facilitate trend analysis.

A time series was employed to demonstrate seasonal and time-related (diagnostic) fluctuations in client CFC user data. Trend analysis, or time series was used for two reasons, firstly to analyse changes over time, secondly to engage in forecasting. The CFC database was exported into SPSS, and converted into a format that allowed for the defining of dates and transformation of data to create a Time Series. Time series was used to understand fluctuations in data over time. Time series did this by breaking-down data into underlying trends (long term), cycles (mid-to long term), seasonal components, and irregular patterns (Wisniewski & Stead, 1996). Only the former two are suitable for making forecasts.

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3.10. Descriptives

Archival data from the past 36 years were used to create a profile of CFC users, and descriptive statistics were produced for:

- Sample size
- Date of birth
- Grade
- Clients present activity
- Home Language
- Referee
- Initial Consultation with
- Frequency of CFC users per year
- Age (at time of referral)
- Gender
- Race
- Socio-economic status – aggregated using payment arrangements
- Terms of Payment
- Average no of visits to CFC per client
- School attended
- Use of Medical Aid
- Reason for referral
- Primary caregiver
- Marital status of caregiver
- Average number of sessions

Descriptive statistics using the median measure for central tendency was used for all nominal and ordinal data, and skewness and kurtosis to assess the shape of the distributions. For interval level data, mean and standard deviation was used.

Frequency bar graphs were used for nominal and ordinal level data, and histograms for the ratio level data. Cross-tabulations were run for:

- Socio-economic status vs. Caregiver Marital Status
- Socio-economic status vs. Presenting problem
- Socio-economic status vs. Race
- Year vs. Race
- Year vs. Gender
- Presenting problem vs. Caregiver Marital Status
- Presenting problem vs. Gender
- Referee vs. Race group

- Age vs. Gender
- Year vs. Gender

3.11. Inferential statistics
3.11.1. Checking the assumptions

Normality tests (Kolmogrov-Smirnov and Shapiro-Wilk) were run to determine the degree to which data was normally distributed. Kruskal-Wallis, the non-parametric equivalent of the Oneway Analysis of Variance (hereafter referred to as "ANOVA") was used where necessary. Where the data met the assumptions of normality and homogeneity of variance, One-way ANOVA was conducted. Post-Hoc Tests were run. Bonferroni was more applicable to the data.

The Kolmogorov-Smirnov and Shapiro-Wilk revealed that all outcomes measured violated the assumption of normality, except for Date of Birth; Grade; Clients level of education; School Name; Number of consultations; Age and Address. Non-Parametric tests were run for the remainder of items violating the assumptions of parametric tests (Please refer to Appendix B for Normality Table).

3.11.2. Time Series and Forecasting

Projections were made using SPSS forecasting, and data was forecast to 2016 (5 years ahead). SPSS Forecasting has the unique ability to use historical data to make predictions. In this case, forecasting involved observation, and analyzing patterns (Armstrong, 2001). Historical information was used to develop models to make predictions. Time series modeler required that data consist of a set of observations made over a period of time, unlike cross-sectional data. This meant that the data gathered from the CFC database is optimal for time series, as it contained a temporal aspect. Date of first consultation was used to define the date the client attended the CFC. This meant that information regarding the day, month and year was available. It was necessary to change the format of the data in the CFC database. The "Define Dates" option was used to assign a month and year to the remainder of the clients information. A Time series was created, and a model built under the forecasting option, using the Expert Modeler. Time series aim to describe through the use of summary statistics and graphs, fit models to explain the temporal patterning to observations, and forecasting and predicting (Reinert, 2010).

The Expert Modeler has a built-in feature of SPSS that automatically chooses the model most fitting to the data. The time series was stationarised by differencing, and the Expert Modeler was used to choose the best fitting models for the data. The modeler produced Autocorrelation (hereafter referred to as "ACF") and Partial Autocorrelation functions (hereafter referred to as "PACF") for differenced series. The ACF is a bar chart of the coefficients of correlation between the time series and lags of itself, whereas the PACF is the partial correlation coefficients between the time series and the lags of itself. Using the ACF and the PACF, you are able to identify the order of autocorrelation and the ordering of moving average.

Autocorrelations provided a method for analyzing underlying trends in the data series by showing the relationship between the values of one variable at two different times (ibid). The lag was used to determine if the data is random (close to zero); stationary (begin at lag k = 1 and work down to 0); trends (autocorrelation significant different from 0, gradually working towards 0); or seasonal (lag equaled 12 (months) or 4 (quarters).

ARIMA models are said to be the most general models for forecasting time series (Nielson, 2005). ARIMA derives its name from:

- AR: Order of autocorrelation
- I: Oder of integration/differencing
- MA: Order of moving average

The ARIMA (*p, d, q*) model, when broken up (Yoram, 2010, pg. 18-1):

- *p* means denotes the lingering effects of preceding scores
- *d* represents the trend in the data
- *q* demonstrates the lingering effect of random shocks, or the random component of the series as reflected by residuals.

So, for example, where *p* = 2, the observation depends on, or is predicted by, 2 previous observations. When *d* = 2, it needs to be differenced twice to make it stationary. Here, the first difference removed the linear trend, the second the quadratic trend etc. When the *p* component was 0, this indicated no relationship between adjacent observations. If *p* was 1, there was a relationship between observations at lag 1and the correlation coefficient Φ_i as the strength of the relationship. A *q* of 0 indicated a lack of moving average components, whereas a *q* of 1 demonstrated a relationship between the current score and random shock at lag 1. Where *q* was 2, there was a relationship between the current score and the random shock at lag 2. Models with seasonal components were expected to peak at lag 12 for monthly data, lag 7 for weekly data, or lag 24 for hourly data. As this data was monthly, seasonal components were expected to peak at lag 12.

Holt's linear trend models are used when the data shows a linear trend, with no seasonality. Simple models are used where the series shows no trend or seasonality.

First, sequence plots of data were generated to demonstrate the sequence of particular events over time, and fit statistics were run. Sequence plots allowed for the determination of central tendency and dispersion. Where the mean was non-stationary, differencing was used to make it non-stationary or flat. Sequence charts were then generated using the fit statistics.

3.11.3. Curvilinear or Non-Linear Regression

Non-linear regression aims to relate a response (y) to a predictor (x) to make future predictions. Unlike linear regression, non-linear regression contains an unknown parameter in the prediction equation (Smyth, 2002). Non-linear regression (linear, quadratic, and curve) was used to create models, and curve fit was used to estimate future trends. Curve fit was the process of fitting a curve, mathematically calculated, such that best fitted a set of data.

3.11.4. Spearman's Rho, or Ranked Correlations

Spearman's Rho or Ranked correlations were produced to determine correlations in the data. Pearson's correlations deal with ratio level data, whereas Spearman's deal more with ordinal and nominal level data, and was therefore utilised in this study, given the level of measurement.

3.12. ArcGIS Analysis

Maps were created using ArcGIS 10.1™, which enabled scalable structures for executing Geographic Information System software. Three-dimensional approaches are more fitting in explaining these relationships rather than traditional linear approaches, as these former models are not "…designed to understand the impact of configurations of factors precisely because their goal is to eliminate co-varying predictors…(and) may underestimate the variations in place characteristics configurations, and their complex relation to individual outcomes" (Dupéré & Perkins, 2007, p. 108).

Dimensional analyses are advantageous in these instances as they enable us to determine the impact of environmental factors on mental health by looking at patterns occurring amongst the combination of variables rather than simple, linear relationships between independent variables. Kernel Home Ranges, found in ArcView 3.3™, a program with a high degree of integration of its GIS environment, compatible with numerous data formats and computer platforms.

3.12.1. Methodology for ArcGIS

3.12.1. Data Entry
Tables were created by running queries then saved as DBase IV files, which were exported to IBM SPSS 22 and ArcGIS 10.1™.

Maps were created using ArcGIS 10.1. Point files were created, forming layers for each participant according to themes, which included referee, school, and residence. A 1:50 000 PMB road map layer was added, which was provided by the University of KwaZulu-Natal's Cartography Department, and a layer from SA Explorer detailing all of the schools in Southern Africa as per year 2000.

All original dbf tables were exported from Microsoft Access™ into ArGIS 10.1, where each client's specified address was plotted on a map of South Africa. Each case was given a spatial location, and a place description (residence; referee; school; university) based on the nature of their relationship to the client, by adding x:y co-ordinates. x:y co-ordinates were assigned to each case using the field calculator option in the attributes table.

A point GIS layer with X and Y co-ordinates of the residential locations of all the clients was created. A polygon GIS layer of the Sub-places of the Msunduzi Municipality. These are local boundaries of local places within a local municipality scale based on SA census project at which population is summarised within an area. The total for each of these sub-places were contained within the polygon's attribute table. The attribute tables of this point layer contained fields with more information about the client, as specified in the criteria for export. These main attributes were used to create these maps:

- **Map showing what suburbs clients reside in (based on total population of each suburb)**
  Using ArcGIS 10.1, the Join tool was used to append/join clients' attribute information to the sub-place polygon based on the spatial locations of the clients' residences within the sub-places. The resulting layer had a summary of the number of clients found within each sub-place boundary which was appended to this polygon layer for the clients' residential location. A map showing the suburb clients reside in, in proportion to the total population of each suburb, was created by symbolising the sub-place polygon spatially joined to the point layers.

- **Map showing temporal changes in reasons for referrals** (year of referral vs. reason)
  Using the point layer of clients' locations, maps were created showing temporal changes of each reason for referrals by symbolising the points using the 'Referral year' field in the attribute table. This was done after points representing each reason were isolated from the other reasons.

- **Map of the reasons for referrals per sub-place** (using stacked charts)
  Using the point layer of clients' locations, maps showing the number of reason for referrals within each sub-place was created depicted in stacked charts based on the 'Reasons' fields in the attribute table.

- **Map showing frequency of visits by clients to the CFC** (using a rose diagram)
  To create a rose diagram showing the frequency of visits by the clients to the CFC clinic with each sub-place, a point layer was generated with each point located at the centre of each sub-place which had at least one client residing in it. The clients' information contained within the sub-places polygons that had been previously joined to the clients' location point layer, was spatially appended to this point layer representing each sub-place. A new polyline layer was then created by creating Euclidian lines (i.e. straight lines) from the location of the CFC

Clinic to each individual point representing the various sub-places. Based on the 'Number of visits' field contained in the sub-place polygon, this information was joined to the point layer and then polyline layer to append the information on the frequency of visits to this polyline layer which would be used to create a rose diagram. The polyline layer was then symbolised based on the corresponding information on the number of visits for each line by changing the line thickness based on the number of visits.

- **Map showing changes in demographic (race, gender) over time per sub-place**

  The map showing the temporal changes of race and gender over the years were created using the point layer showing the clients' residential locations. To do this, these points were symbolised using varying point sizes and gradient colour for easier visualisation of overlapping points. To do this, the 'Referral year' field was used by using the 'Quantity by category' and then 'Variation by Symbol Size' tools under the 'Symbology' tab in ArcGIS. Individual maps were produced for all the race and gender groups.

A point GIS layer with X and Y co-ordinates of the schools attended by all the clients was also created. This dataset and point file was used to create the following maps:

- **Map of clients' school distribution throughout the Msunduzi region**

  Using ArcGIS 10.1, the Join tool was used to append/join clients' attribute information to the sub-place polygon based on the spatial locations of the client attributes within the sub-places. The resulting layers had a summary of the number of clients and schools they attended found within each sub-place boundary which was appended to this polygon layer of schools they attended. A map showing the suburbs clients go to school in proportion to the total population within each suburb was created by symbolising the sub-place polygon spatially joined to the point layers.

- **Map of temporal changes in clients' school attended**

  The map showing the temporal changes of schools attended over the years were created using the point layer showing the schools attended locations. To do this, these points were symbolised using varying point sizes and gradient colour for easier visualisation of overlapping points. To do this, the 'School year' field was used by using the 'Quantity by category' and then 'Variation by Symbol Size' tools under the 'Symbology' tab in ArcGIS.

The data was broken up into different sections, and a combination of the above techniques used to explore them. The sections were as follows:

Initial Consultation with:
- Frequencies
- Forecasting/Time Series

- Cross-tabulations of initial consultation with vs. race

Referee:
- Frequencies
- Forecasting/Time Series
- Caregiver Marital Status
- Frequencies
- Forecasting/Time Series
- Curve fit/Curvilinear Regression
- Socio-economic status vs. caregiver marital status

Medical Aid:
- Frequencies
- Sequence Chart
- Forecasting/Time Series

Gender:
- Frequencies
- Line chart of age and gender
- Line chart of age and gender per year
- Maps detailing geographic distribution of gender
- ANOVA: Temporal changes in gender
- Curvilinear/Non-linear Regression
- Forecasting/Time Series

Race:
- Frequencies
- Sequence Charts of each race group
- Curvilinear/Non-linear Regression
- Maps detailing geographic distribution of race
- ANOVA: Temporal changes in race

SES:
- Histogram of terms of payment
- Socio-economic status per sub-categories of race and presenting problems
- Terms of Payment
- Histogram
- Descriptives

Presenting problems:
- Bar chart
- Sequence chart of top three presenting problems
- Curvilinear/Non-linear Regression
- Map detailing the frequency of reasons for referral per sub-place
- Maps detailing the geographic distribution of the most significant presenting problems

- ANOVA: Temporal changes in top three presenting problems
- Forecasting/Time Series
- Grouped frequency distribution of presenting problem by gender

CFC client profiling:

- Map detailing residence
- Bar chart of CFC clients per year
- Histogram of average number of CFC consultations
- Map of frequency of consultations
- Map of frequency of consultations per sub-place
- Map of temporal changes in residence
- Map of Schools attended by CFC users
- Map of temporal changes in Schools attended
- Sequence charts of top three schools attended
- Curvilinear/Non-linear Regression of schools

3.13.   Ethical considerations

Informed consent requires consent to be given prior to commencing research. Informed consent involves fully understanding the risks, requirements and benefits of participating. This understanding should be carefully weighed before deciding to participate or not. This decision should be made free from undue influence or coercion. In other words, informed consent is "…only ethical when it is prior, informed and understood, freely given and specific…" (Navarro, 2008, p. 257). Identifiable data refers to data that captures essence of a person, and therefore represents their identity as an individual. Electronic databases capturing personal characteristics reflect aspects of that person themselves, and becomes a site associated with privacy concerns as those features captured therein reflect on that person as an individual, and aspects of their individuality that could be stigmatising. The legal and ethical concerns surrounding access to patient identifiable data without their consent remains a highly controversial topic. The value of this type of data for biomedical and social science research cannot, however, be sufficiently emphasised (Acta, 2008).

The act of obtaining post hoc consent has been widely criticised. Lack of consent is not necessarily indicative of a true refusal of access to and analysis of a person's data (Haynes, Cook, & Jones, 2007). Obtaining post hoc consent from clients may incur large expenses, and yield a biased sample (Al-shahi et al., 2005). Haynes, Cook & Jones (2007) conclude after an extensive review of the various acts and drawbacks of obtaining post hoc consent, that it may not be necessary to obtain consent to disclose and collect patient-identifiable data for research purposes *en provisio* that they demonstrate compliance with the Data Protection Act (hereafter referred to as "DPA") of 1998, Human Rights Act (hereafter referred to as ""HRA") of 1998 and the National Health Service (hereafter referred to as "NHS") principles of Good Practice (which includes the Confidentiality Code of Practice which requires that processing information meet the requirements for confidentiality).

Confidentiality is a fundamental ethical principal, and is intimately bound up with respect for autonomy (Johnston & Slowther, 2003). Respect for autonomy requires that under no circumstance may a person's details be disclosed without consent, and only within the 'circle of confidentiality' amongst only those directly involved in providing care to that person (Merz, Spuna & Sankar, 1999). Ensuring patient confidentiality often means patients give more open and relevant answers that can be used to properly inform decisions regarding that research subject (Navarro, 2008). However, there may be times where acting in the interest of the public requires that confidentiality be breached (e.g. in the case of revealing the identity of criminals), making confidentiality a fine balancing act, where individual interest is carefully played against the demands of public interest.

Confidentiality and privacy of personal data is implicated when deciding whether or not reviewing and using information contained within records (electronic or otherwise) is possible without obtaining informed consent for the purposes of that review. It can be argued that in many instances, the very people who are reviewing the records are the physicians or scientists that were responsible for creating those files in the first instance, which minimises the probability of them abusing this privilege or incurring any type of physical or mental harm. Further, the mere fact that the research has to be pre-approved minimises harm (Acta, 2008). It could also be argued that obtaining post hoc consent will in itself pose more potential harm than reviewing records without it.

The key question seems not to be whether we can access the information, but rather whether or not the report of the study reveals any personal or identifiable information that will breach the confidentiality of an individual or groups of people. In most instances, the most likely data to reveal personal information is case reports (Wrigstad & Algvere, 2006), and even though they do not usually require pre-approval, approval is necessary from the study participant themselves (Acta, 2008).

Wilson (2004) suggests two alternatives to the overcome problems to do with post hoc consent. Her first suggestion is that anonymised data may be used without notifying or obtaining consent (other than their original consent for the initial, and often broader study) from participants provided that data protection legislation be complied with. This means that '…sensitive data to be processed for the purposes of medical research only by a health professional or a person who owes a duty of confidentiality that is equivalent to that which would arise if that person were a health professional…' (Wilson, 2004, par. 7, online). Her second suggestion is that the use of personal data without consent occurs under rigorous regulation of the Data Protection Act 1998. Section 33 (4). It has generally been accepted that provided that the principles of the Data Protection Act (DPA, 1998) are complied with, then no harm should be incurred (ibid). According to this act, 'personal data' refers to information about a living individual that can be used to identify that individual (Navarro, 2008). This act requires that all data should be rendered anonymous to the extent that the research subject can no longer be identified. This requirement, however, does not ensure that confidentiality is maintained (Haynes, Cook, & Jones, 2007), nor does it stipulate what processes are involved in obtaining this state of

anonymity (Wilson, 2004). Therefore, it may be necessary that approval under Section 60 of the Health and Social Care Act 2001, which outlines how patient information should be controlled. This section requires that no processing of confidential information for any purpose be allowed if that same purpose can be achieved via other route (Office of Public Sector Information, 2001).

This proposed study is an extension of an Honours study conducted in 2007, which had received ethical approval from the University of KwaZulu-Natal's Social Science Research Ethics Committee. The approval of Independent Review Board's or Independent Ethics Committee's ensured good conduct on the part of the researcher, and determined whether the chosen methodology is valid. Records were analysed (without participant knowledge) but in a confidential manner that ensured their confidentiality, and therefore minimise all foreseeable harm.

As respect for dignity, rights and welfare should be an overriding concern during the research process, data was recorded at the CFC premises, in a room inaccessible to unauthorised persons. Clients' names' and other identifiers were not utilised. Instead identification numbers were used. The only source of identification to a client record was their unique identity number which is stored at the CFC, and locked in a filing cabinet. Only the principal researcher has access to this document. The information that was disseminated was only be done once identification numbers were removed from all sources of data, and all data had been aggregated with the rest of the sample. Electronic files containing data were protected by passwords, known only to the researcher and their supervisor. Anonymity regarding place of residence was ensured by plotting client residences in an aggregate manner. The actual location of the client's residences were not used, rather, an aggregate point.

Full Ethical Clearance was obtained by the School of Health Sciences, please see approval letter attached (Appendix A).

3.14. Validity

Validity generally refers to the degree to which a variable measures what it is supposed to (Hopkins, 2000). Validity is divided mainly into Internal and External Validity.

Internal Validity refers to the degree of certainty that outcomes that are directly and causally linked to the testing variable, and not to extraneous or confounding variables.

External Validity, or the generalisability of your research findings, refers to the extent to which your findings can be applied to settings superseding that of a controlled environment.
Threats to validity include (Silverstein, 1999):

- **Chance -** Random error attributable to unknown sources of variation in findings, and can be overcome by increasing sample size and performing statistical analyses.

- **Bias -** A systematic error skewing the sample or measure. Overcome by standardising your measurement, training and certifying the observer, refining the instrument, automating instruments and blinded measures.
- **Confounding variables -** An external influence that confounds the relationship between the predictor and outcome variable. Overcome by identifying and measuring potential confounding variables, and performing a multivariate analysis.

According to Bornheimer *et al.* (2008), Validity in quantitative studies can be achieved by using measurements, scores, instruments and rigorous research design, and reliability by assumption of repeatability.

3.14.1. Threats to validity may include:

It is important to note that primary findings do not constitute prevalence data, but rather reflect presenting problem trends in association with the reach/access trends of the CFC. Thereafter, primary data says nothing in particular about problems in particular sub-areas, as it is confounded by reach.

Quality of records have been effected by:
- Documents have been lost during the move;
- Data entry decay;
- Changes in places names, and therefore the inability to locate them;
- Lack of information in records and the inability to recover that information;
- Diagnostic Trends; and
- Illegible handwriting – data is lost.

Other threats to validity include:
- Data entry inconsistency as different data capturers have their own unique perspective;
- Lack of access to psychological services during Apartheid for previously disadvantaged groups means a loss of information. This creates an incomplete picture of historical and psychological impact;
- Only those individuals who have been identified as having a problem were referred. This means that all individuals who either have not been identified by family or the community, and those with the lack of knowledge of CFC services have not attended the CFC. This creates a bias in the data in that only those with the information and opportunity have been referred; and
- Given the extent of records created over three decades, it was near impossible to enter all information timeously.

3.15. Reliability

Reliability refers to the reproducibility of measures upon retest, or achieving consistent results over multiple tests, and is a requirement for validity (Hopkins, 2000). If a test is reliable, this does not

necessarily imply that the test is valid. Reliability is not a value judgment, nor is it a characteristic of the test, rather it is measuring the same, defined and measurable, item characteristic of that group of individuals (Bornheimer *et al.,* 2008).

1. **Inter-Rater or Inter-Observer Reliability –** The extent to which different raters agree when measuring a the phenomenon of interest
2. **Test-Retest Reliability –** The extent to which results compare when retesting the initial test at later stages
3. **Parallel-Forms or Alternate-Forms Reliability –** The extent to which results compare between two similar tests
4. **Tests for Homogeneity or Internal Consistency –** The extent to which individual items measuring the same construct in a test correlate

In this study, possible threats to reliability and validity include:

Referral population - The manner in which clients are referred to the CFC create the potential for sample bias. The same schools servicing a certain niche in the population making referrals to the CFC does not ensure that the principle of generalisability is met as the students attending it are not exhaustive of the schooling population. Futhermore, the population serviced by the CFC are largely those who cannot afford psychological services. This skews the sample, compromises generalisability and consequently external validity.

In addition, referrals may be made from referring agents where there was no actual problem. In other words, by pathologising normal behaviour. For example, if a child is restless or academically unsuccessful, they may be labelled as 'ADHD' in referral letters (Zur, 2010).

Integrity of records - The relative incompleteness of some records, and the inability to complete missing entries may compromise the sample size of certain variables, open itself to bias, may affect the repeatability of information, and therefore compromise reliability.

Temporal trends in diagnosis - Temporal changes in approaches/paradigms to mental disorders and therefore methods of assessment and therapies could introduce the possibility of confounds as outcomes are influenced by the measures or paradigms presiding during that time, compromising the linear relationship between variable and outcome. For example, there has been a marked change in psychological instruments over time as psychologists came to realise the importance of cultural sensitivity and the importance of sociocultural, political and economic context in which the person is embedded. This has implications for inter-rater reliability as different psychologists observing the same phenomena of interest, influenced by their current paradigm will come to different outcomes as psychological tests, measures and approaches are contextually and historically or temporally influenced. Despite standardising the database to ensure data capturers collect the same information,

the information itself is laden with temporal trends in psychological testing as different psychologists means no standard 'rater' or 'observer'. They have different perceptions, and have made different diagnoses using the Diagnostic and Statistical Manual (hereafter referred to as "DSM"), which is more a politically embedded document, than a scientifically valid one (Zur, 2010).

The embedded nature of the individual allows for many a confound when trying to assess the relationship between a variable and its psychological outcome, once again threatening the validity of findings when assessing for example the effect of socio-economic status and diagnosis.

The DSM itself as a classification tool has been cited for the relative vagueness of terms used, with the result of diverging interpretation, and reporting (Zur, 2010). It has poor reliability as different practitioners with varying ability and background will produce differing results. This feat calls into question its validity, through bias as the DSM itself as an instrument, is not sufficiently refined, nor standardised (Zur, 2010). Diagnoses and other outcomes based upon DSM classifications are therefore questionable.

3.16.   Attempts to overcome threats to reliability and validity:

Database development:

An attempt to ensure validity through repeatability by standardising the capturing of information in this project by creating a database which prompts user for the information required to be captured, thereby standardising what is collected, and what should be extrapolated from the records. In this way, we attempt to ensure validity of measures too, as the prompted information entered by one user, should be able to be repeated by another.

The findings of this study are not intended to be generalised to the population outside of the CFC. It is rather intended to inform future programs and program evaluations by providing empirical evidence of shortcomings, and to ensure that maximum benefit can be derived at minimal cost.

Sample characteristics were be compared to population parameters to determine external validity. Construct validity was ensured through the use of factor analysis.

GIS has proven its prowess in overcoming "small area variations" that often cause statistical error. The sample represents more than 50% of the estimated CFC population.

3.17.   Limitations

Limitations to the study include:
- Only those records that met all the pre-defined criteria for export were included in the sample
- Potential bias may have been introduced as only those records meeting the export requirements were included in the final sample

- Lack of random sampling meant that bias and error in the data could not be controlled for
- Data is not an indicator of prevalence, rather, the referral patterns of CFC users
- Referral patters are not a direct analogue of prevalence, and are confounded by reach, access, and migration
- Only those individuals with opportunity and who were attending schools who had pre-existing relationships with the CFC were mainly referred. Generalisability is problematic to ascertain
- This is not an evaluation, rather, an exploration of the data and methods available to the CFC to perform an evaluation and Needs Assessment
- Only those individuals who have been identified as having a problem were referred, meaning that all individuals who either have not been identified by family or the community, and those with the lack of knowledge of CFC services have not attended the CFC. This creates a bias in the data in that only those with the information and opportunity have been referred

Conclusion

This study is a quantitative, retrospective record review of the Pietermaritzburg Child and Family Centre. No particular sampling strategy was used. Based on the criteria listed above, a sample of 1975 records were exported from Microsoft Access and analysed using SPSS, and ArcGIS to create service user profiles. The results of the analysis were used to inform future Needs Assessments and Programme evaluations.

CHAPTER 4: PRESENTATION OF FINDINGS, INTERPRETATION, AND DISCUSSION

This chapter will present the primary findings from the SPSS and ArcGIS analysis and dovetail it with the reviewed literature in attempt to achieve the study's two-pronged objective, and answer the primary and secondary research questions. In line with this, this study attempts to gather baseline data of CFC service users, access and reach, and place the CFC on a firm evaluative grounding. What will ensue is an outline of the sample, an attempt to identify temporal patterns in demographic, referral problem and other outcomes, in order to formulate baseline measures of CFC users. Both descriptive and inferential statistics will be used to present findings. The primary findings will be presented alongside the literature in attempt to dovetail convergent and divergent trends. In so doing, a discussion of the general findings will ensue, and contextualised understanding gained.

4.1. Descriptive Statistics

Sample statistics will first be presented using frequency bar graphs and histograms, as determined by the level of measurement of data. Date of Birth, followed by client's level of education, present activity, race, home language, referee, and initial consultation with.
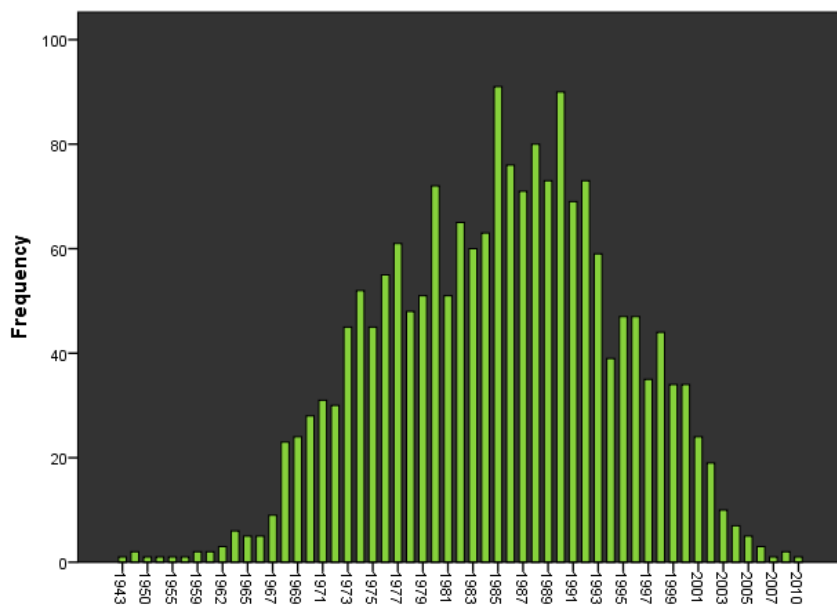
4.1.1. Sample

**Figure 4.1.** Bar chart of client's date of birth (in years)

Refer to Appendix E. The sample consists of 1974 records. The mean year of birth was 1985, with a standard deviation of 9.319 years (n = 1877). The earliest recorded date of birth is 1943, and the latest recorded birth was 2010, giving a range of 67 years. The mean age of the sample was 10.78 years, with a standard deviation of 8.580 years. At time of database retrieval, the youngest reported attendee was 1 years' old, and the oldest 57 years old, giving a range of 56 years. The child and family center mainly focusses on providing psychological services to children, and their families. A mean age of 10 years old is fitting to the overall sample. A previous study conducted by Upton (2007) suggested similar findings. Similarities in sampling mean, and standard error suggest that representivity and generalisability of findings to the remainder of CFC records is possible.

Overall, 72.7% of clients were in Grade R – Grade 7 (n = 1537), with the highest percentage of clients coming from grade 2 and 3 (33%). 1.6% of reported cases were attending special class.
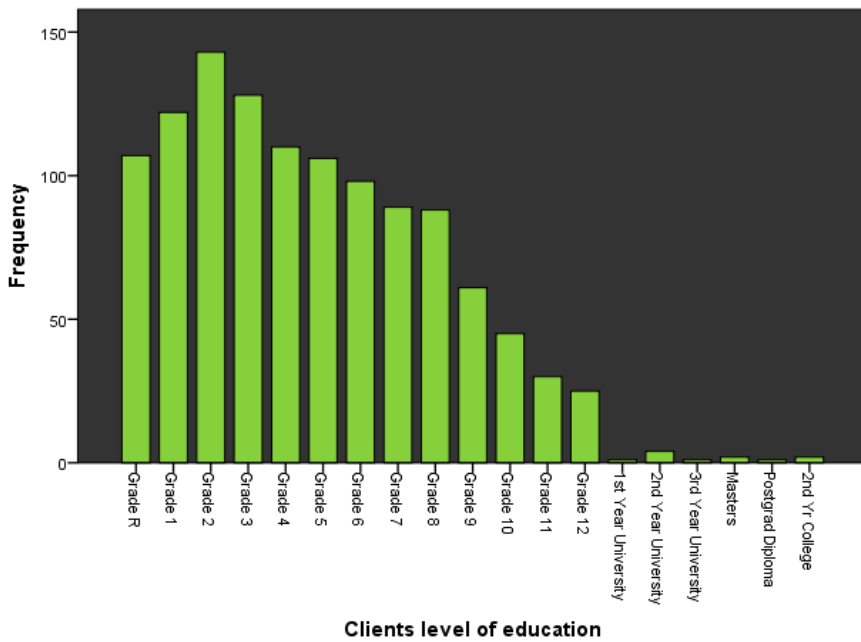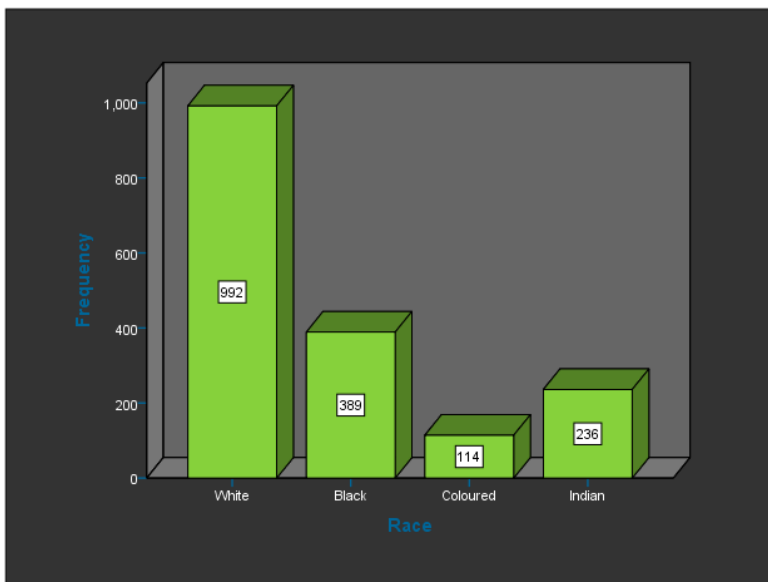
Figure 4.2. Bar chart of client's level of education

**Figure 4.3.** Bar chart of client's present activity
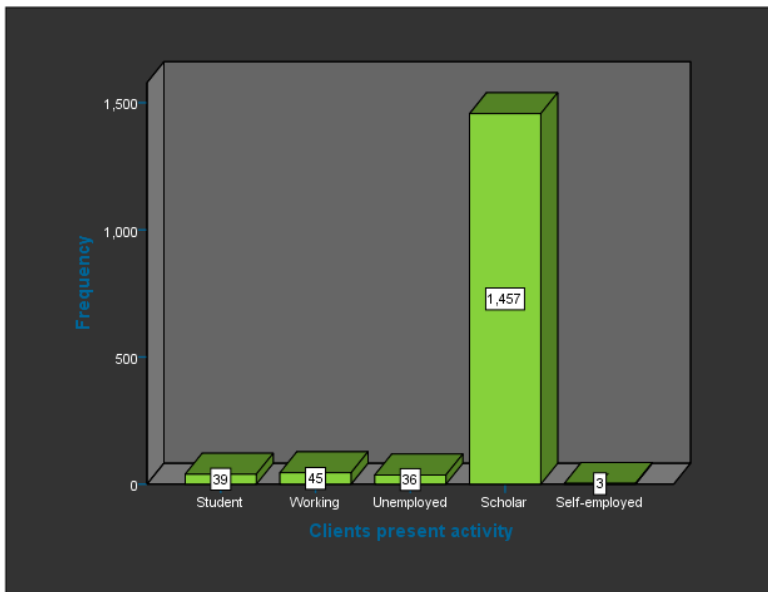
The median grade was 5.50, which is between Grade 4 and 5, and is positively skewed meaning that the majority of the distribution is still schooling. 21.1% of CFC clients were attending high school, and 0.4% attending university. 4.2% of the sample marked their schooling as N/A. The median present activity was 4 (Scholar), with a kurtosis of 14.343, indicating a high peak. 92.2% of attendees were scholars.

Overall, 57.3% of the sample were White, 22.5% Black, 6.6% Coloured, and 13.6% Indian (n = 1731). The median race is White.
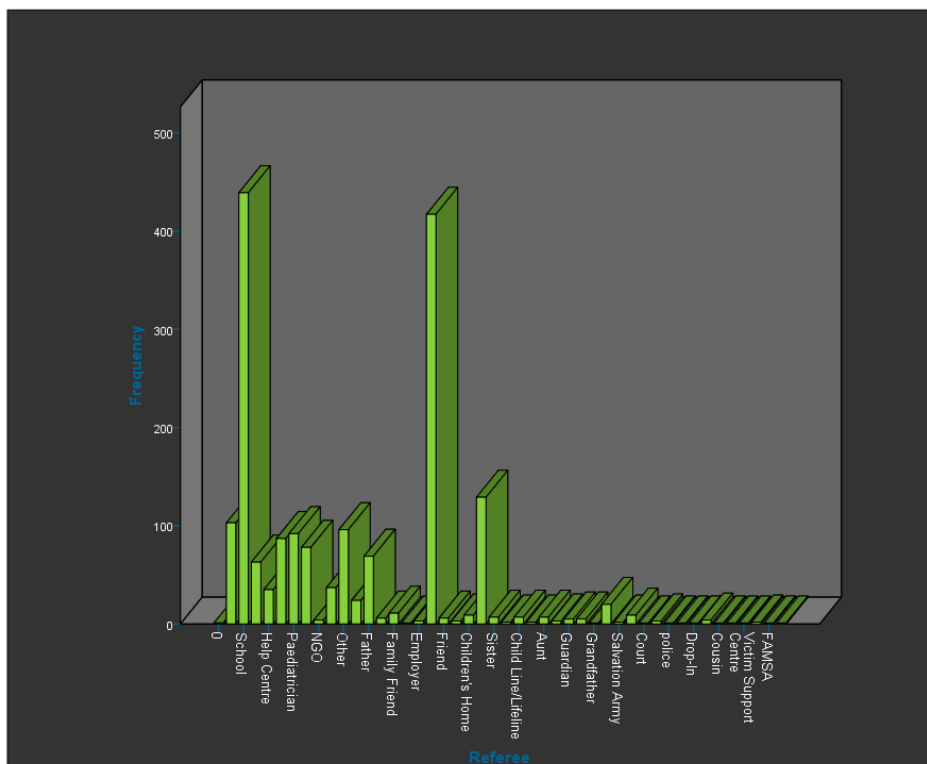
Figure 4.4. Bar chart of client's race

Figure 4.5. Bar chart of client's home language
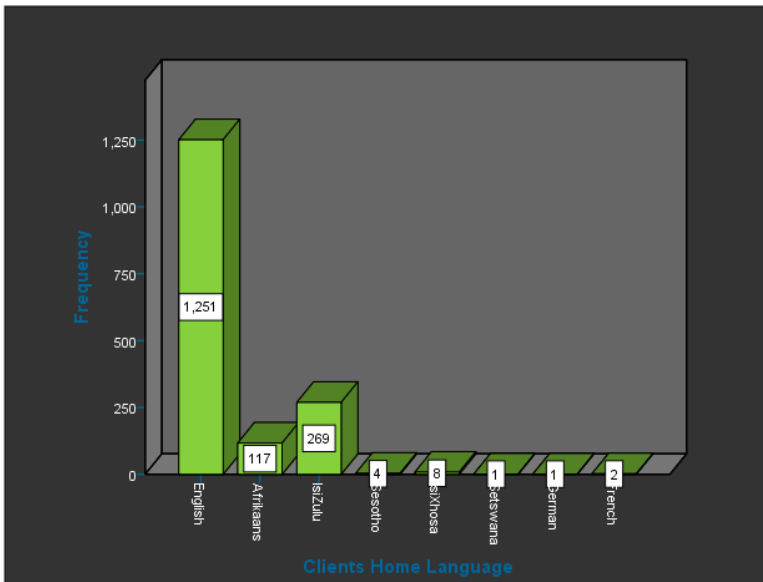
The majority of the sample are English speaking; followed by isiZulu; and Afrikaans. The median home language is English. This makes sense as the more than half of the sample was White (57.3%). There has, however, been a significant change in Home Language over time ($F_{(60, 1361)} = 6.399$, $p < 0.0001$).

4.1.2. Referee

Figure 4.6. Bar chart of client's source of referral

The highest number of referrals came from schools (24.4%), which is not surprising seeing as that at least 92.2% of the sample were scholars. The next highest referral body were intern psychologists (23.2%); followed by parents (7.2%); Qualified Psychologists (5.7%); Paediatricians (5.1%); General Practitioners (4.8%); Social Workers (4.3%); Fathers (3.8%); and drop-ins (3.5%). The highest frequency of scholars are from Ridge Junior Primary School (4.5%), followed by Scottsville Primary

(4.2%); and Clarendon Primary (3.5%). It is interesting to note that two of the three top referral schools fell within a 5km radius of the CFC. Further, until recently, intern psychologists were placed at these schools. Even though no interns are placed at Scottsville, Masters students involved in the professional psychology degree linked to the CFC still attend Scottsville Primary learners.
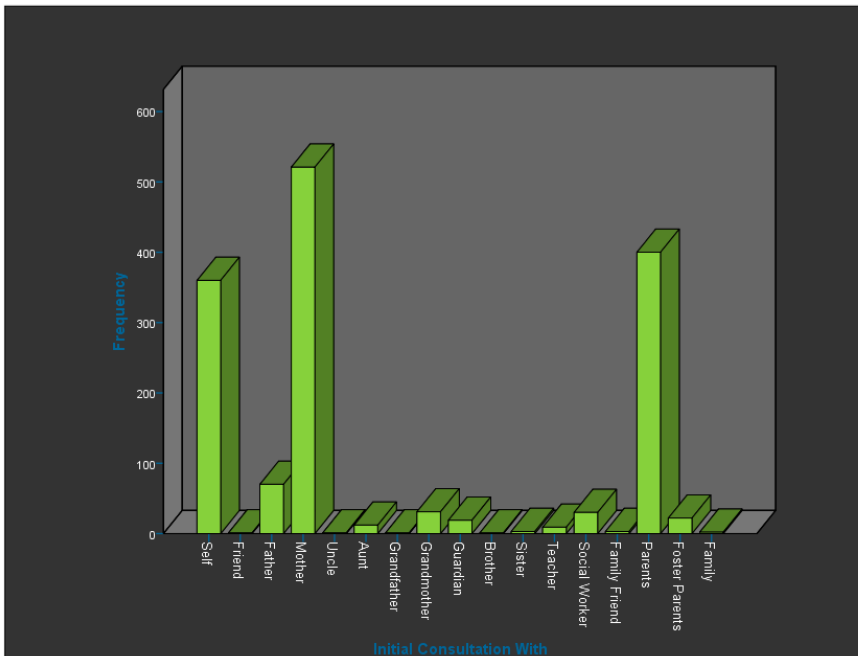
Thirty five percent of clients attended their initial consultation with their mother compared to a mere 4.7% with their father; 26.9% with both their parents; 24.2% attended their consultation alone; 2.1% attended with their grandmother; 2% a social worker; 1.5% with their foster parents; and 1.3% with their Guardian (n = 1486). In terms of relationship of caregiver to child, 35% were the clients parents; a further 33.8% were the clients mother compared to a mere 6.7% being their father (n = 1917).

The fact that over a third of child attendees were accompanied only by their mothers, or alone, is alarming. According to the KZN Safety and Liaison Department (2010), in 1969 90% of children lived with both their parents, however, by 1987 this figure dropped to 30%. A cross-tabulation of respondent's age and initial consultation with shows that 79.1% of all attendees attending alone are below the age of 18 years. 99.6% of attendees attending with their mother alone fell below the age of 18 years. These statistics suggest a lack of family cohesiveness, and familial support. Lack of familial support has been identified as a risk factor for mental illness (Kulka, Veroff & Douvan, 1979; Jones, 2004; Robinson, Rodgers& Butterworth, 2008; Caldas de Almeida & Killaspy, 2011), which makes these statistics worrisome.

Time series and forecasts were used to identify trends, cycles, seasonal or erratic components of the source of referral data. What will follow is a presentation of the primary findings, dovetailed with the literature where

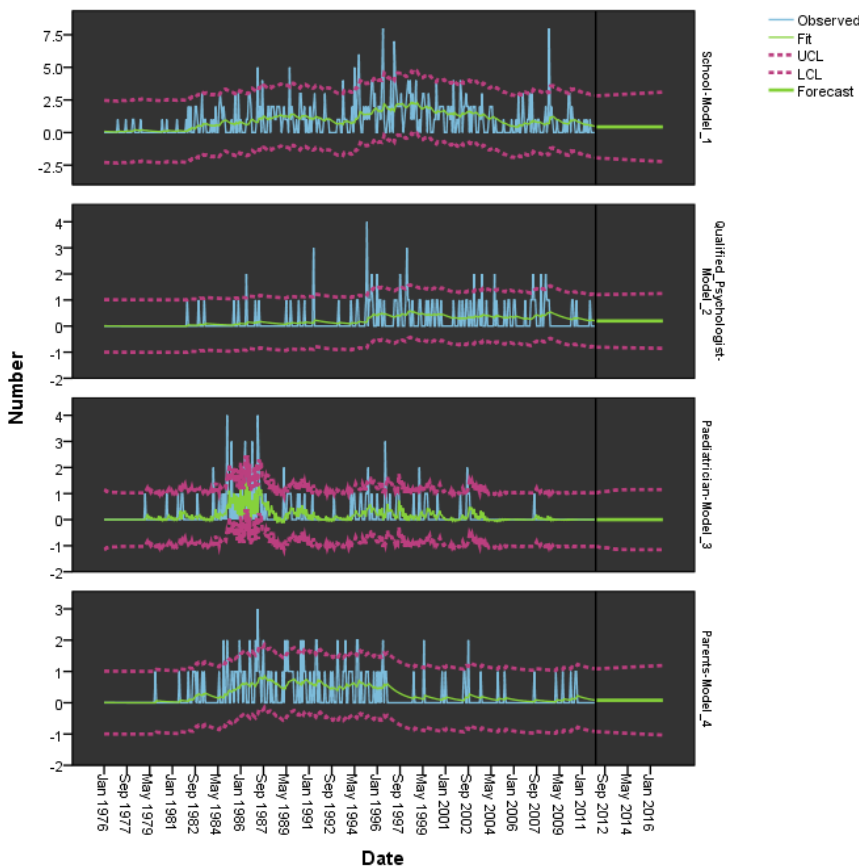**Figure 4.8.** Residual ACF and PACF for source of referral
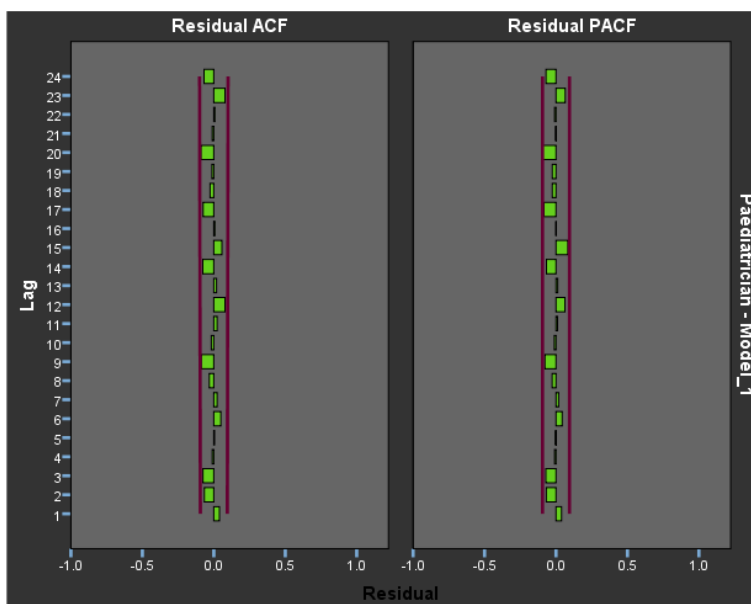
literature is available. The time series modeller selected the following tests that best fit the data for each source of referral:

Table 4.1.
Models used to forecast source of referral

Model Description			
			Model Type
Model ID	School	Model_1	Simple
	Qualified Psychologist	Model_2	Simple
	Paediatrician	Model_3	ARIMA(2,0,12)
	Parents	Model_4	Simple

The best fitting models chosen for initial consultation with was the simple model as the data showed no trend, nor seasonality. The ARIMA model was used for Paediatricians with 2 orders of autoregression, 0 orders of differencing, and 12 orders of moving averages. The lack of differencing in the ARIMA model demonstrates the lack of trend in the data for Paediatrician. MaxAPE revealed that the largest error for each model falls between 2-8%. All models are significant except for Psychologist and Paediatrician (R^2 = 0.132, Q' (17) = 38.515, p < 0.002); (R^2 = 0.430, Q' (17) = 26.475, p < 0.0066); (R^2 = 0.147, Q' (14) = 20.541, p < 0.114); (R^2 =

0.132, Q' (17) = 40.524, p = 0.001). ACF and PACF reveal that no significant trends in referrals from paediatricians, except a differencing of 3 at lags 14, 17 and 20. Referrals from schools seem to taper off from May 2009. This is an interesting finding as it was around this time that CFC interns were no longer placed at Schools close to the CFC, and may account for this decline. The lower limit shows a decline in forecast to 2016. Referrals from schools seem to occur mostly between May 1994 and May 2004.

Referrals from parents show a steady decline between January 1996 and September 1997. This once again hints at a decline in parental involvement in their child's wellbeing. This lack of parental involvement extends to their involvement in schools (Msila, 2012). Socio-economic status is said to be related to parental involvement and scholastic success (Singh, Mbokodi & Msila, 2004; Msila, 2009).

This increased lack of parental involvement is alarming as up to 3% of childhood mental illnesses before the age 9 years is due to parental neglect (Okasha, 2002). In other words, children require "… supportive relationships that directly provide something that people need to stay healthy or adapt to stress." (House et al, 1988). Casale *et. al.* (2012) found that in a survey of 2477 caregivers of children in 2 KZN, that there was a positive correlation between social support, and mental health. In addition to these findings, there was a negative correlation between social support and self-reported levels of anxiety and depression. This highlights the protective role that social-support offers in better dealing with mental health (Casale & Wild, 2013). This decrease in parental involvement could be as a result of an increase in the loss of parents to HIV-related diseases. This will be discussed in greater detail further in this chapter.
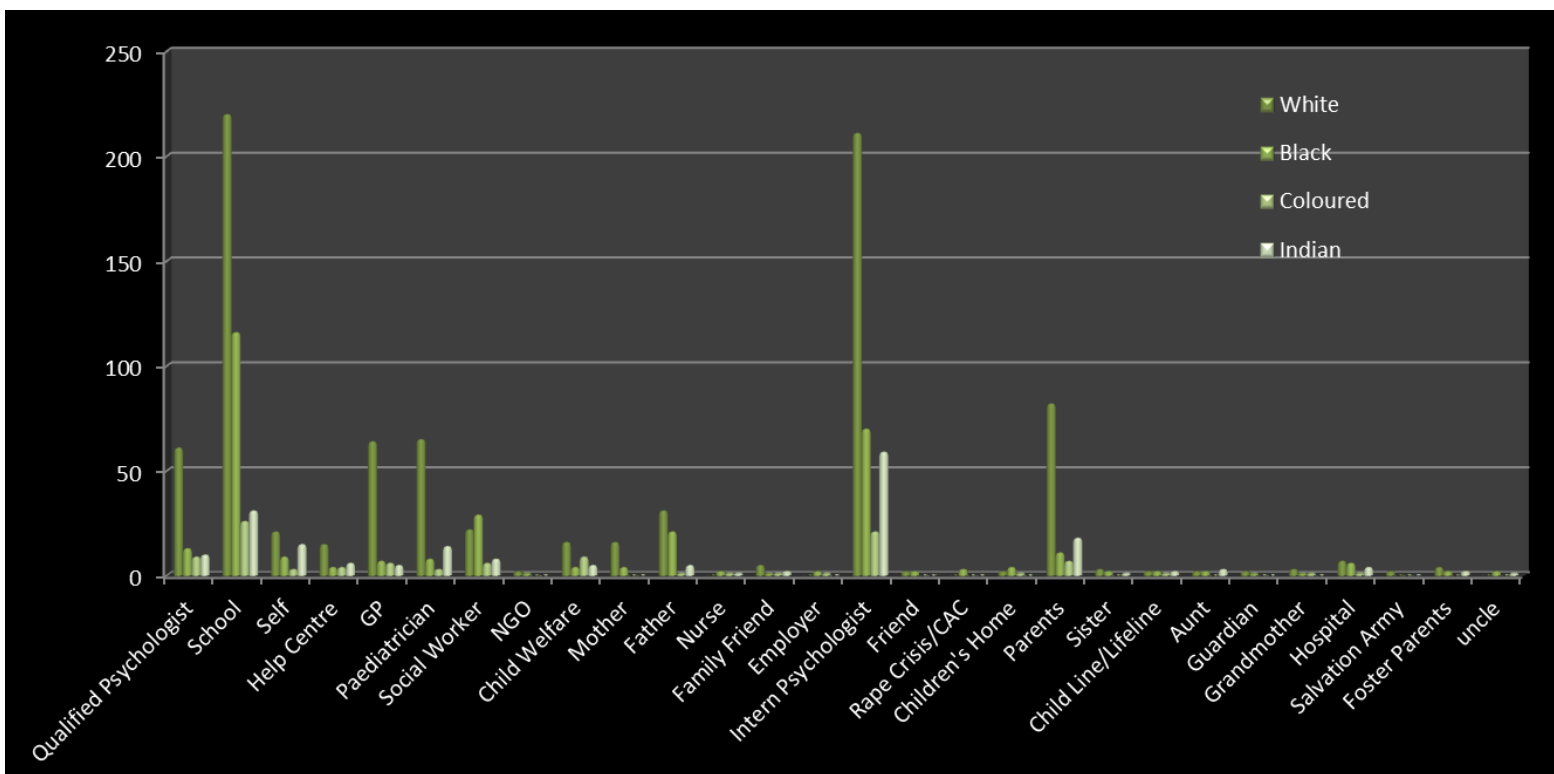
Figure 4.10. Bar graph by race of client referee

The above cluster bar chart demonstrates the differences in referrals made per race group. Social workers referred more Black people than any other race group. A fair number of referrals for Black CFC attendees also came from their Schools, their fathers, and Intern Psychologists. White CFC attendees on the other hand were mainly referred by Schools, Psychologists, GP's, Paediatricians,

and their parents. Indian CFC attendees mainly received referrals from Schools, Intern Psychologists and their parents. Coloured individuals were mainly referred by Child Welfare, Schools and Intern Psychologists.
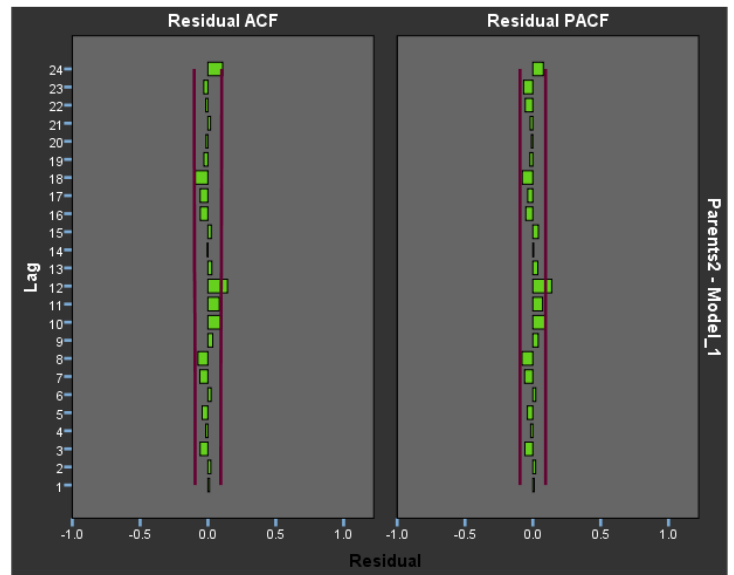
The time series modeller selected the following tests that best fit the data for each initial consultation with:
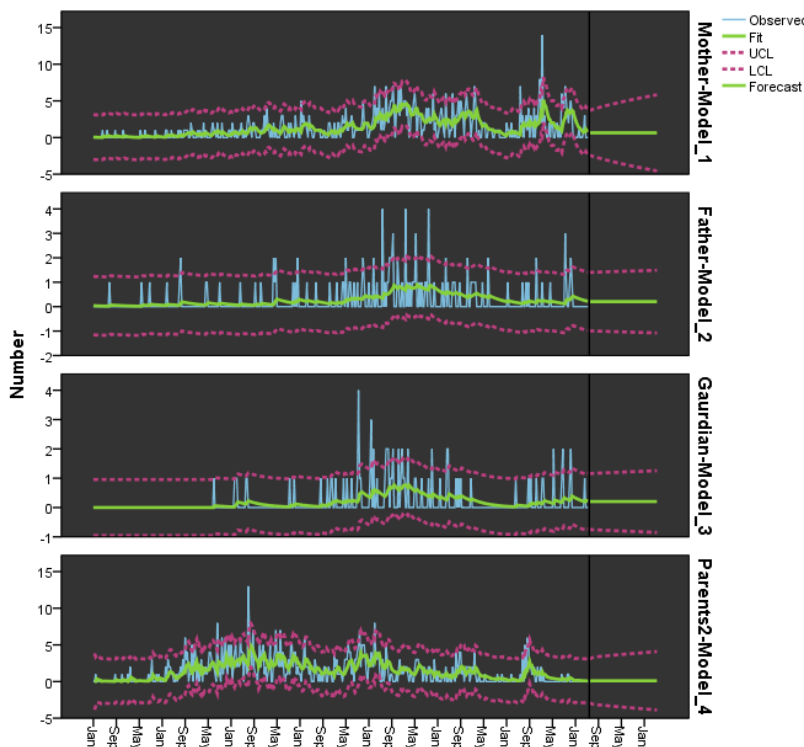
4.1.3. Initial Consultation with

Table 4.2.
Chosen models to forecast client's initial consultation with

<table>
<tr><th colspan="3">Model Description</th><th></th></tr>
<tr><td colspan="3"></td><td>Model Type</td></tr>
<tr><td>Model ID</td><td>Mother</td><td>Model_1</td><td>Simple</td></tr>
<tr><td></td><td>Father</td><td>Model_2</td><td>Simple</td></tr>
<tr><td></td><td>Guardian</td><td>Model_3</td><td>Simple</td></tr>
<tr><td></td><td>Parents2</td><td>Model_4</td><td>ARIMA(0,1,5)</td></tr>
</table>

Figure 4.11. Residual ACF and PACF for clients initial consultation with

The best fitting models chosen for initial consultation with were simple models as the data showed no trend, nor seasonality. The ARIMA model was used for parents with 0 orders of auto-regression, 1 order of differencing, and 5 orders of moving averages. The ARIMA model for parents showed differencing of 1 to make the mean non-stationary. This differencing of 1 in the ARIMA model removed the linear trend. MaxAPE revealed that the largest error for each model falls between 2-12%. All models are significant except for the one for fathers (R^2 = 0.274, Q' (17) = 53.096, p < 0.0001); (R^2 = 0.464, Q' (17) = 24.420, p < 0.108); (R^2 = 0.087, Q' (17) = 66.350, p < 0.0001); (R^2 = 0.282, Q' (17) = 31.618, p = 0.011).

Initial consultations with client Mothers are the most frequent, and show an increase from roughly January 1996, declining somewhat between May 2004 and September 2007, picking up again thereafter. Consultations with client Fathers start increasing in Sept 1997, and taper off in September 2007, but thereafter show an incline again in January

Figure 4.12. Time Series Forecast of client's initial consultation with

2011. Consultations with client guardian's increase around January 1996, taper off in May 2004, and pick up again in September 2007.

Sequence charts were produced for marital status in effort to identify temporal trends.

4.1.4. Marital Status of Caregiver
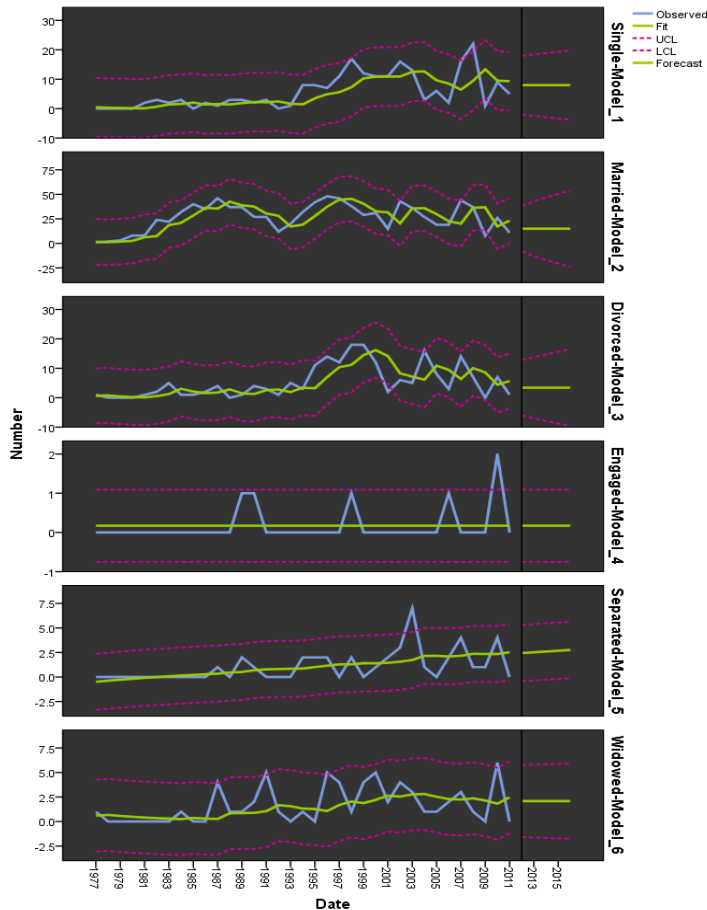
From the adult client sample, 1.7% were married; 0.4% divorced; 0.1% were separated; and 0.6% were widowed. 14.2% of the caregivers of CFC clients were single; 65.2% were married; 13.2% were divorced; 4.2% were widowed; 2.9% separated; and 0.4% engaged, with a median of Married, and a positive skewness and high peaked distribution (n = 1540). ANOVA for marital status over time was significant $F(61. 1535) = 1.741$, $p < 0.0001$). 2.3% of the sample were unemployed; and 2.8% were working, and 0.2% were self-employed (n = 1580). Dyer (2012) mentioned that the White community was largely cohesive during the former years of CFC establishment (1970-1990). The figures above attest to this fact.

Table 4.3. *Time series models chosen to forecast caregiver marital status*

	Model Description		Model Type
Model ID	Single	Model_1	Simple
	Married	Model_2	Simple
	Divorced	Model_3	Simple
	Engaged	Model_4	ARIMA(0,0,0)
	Separated	Model_5	Holt
	Widowed	Model_6	Simple

The time series modeller selected the simple model for all marital status data, except engaged (ARIMA model) and Separated (Holt). This will be discussed further after presenting the regression results.

Table 4.4. *Predicted counts with upper and lower confidence limits*

| Model		Forecast				
		2012	2013	2014	2015	2016
Single-Model_1	Forecast	8	8	8	8	8
	UCL	18	18	19	19	20
	LCL	-2	-2	-3	-3	-4
Married-Model_2	Forecast	15	15	15	15	15
	UCL	38	43	47	51	54
	LCL	-8	-13	-17	-21	-24
Divorced-Model_3	Forecast	3	3	3	3	3
	UCL	13	14	15	16	16
	LCL	-6	-7	-8	-9	-10
Engaged-Model_4	Forecast	0	0	0	0	0
	UCL	1	1	1	1	1
	LCL	-1	-1	-1	-1	-1
Separated-Model_5	Forecast	2	3	3	3	3
	UCL	5	5	5	6	6
	LCL	0	0	0	0	0
Widowed-Model_6	Forecast	2	2	2	2	2
	UCL	6	6	6	6	6
	LCL	-2	-2	-2	-2	-2

The number of separated caregivers is projected to increase by 2016. The ARIMA model for engaged shows no significant lags, and no trend. There were no outliers.

**Figure 4.13.** Time Series Forecasts for caregivers marital status
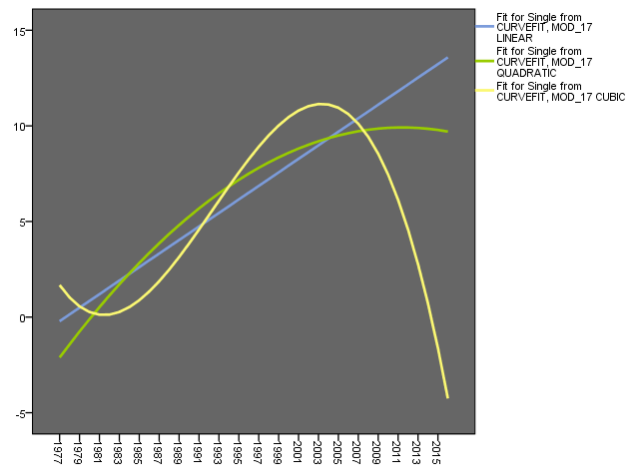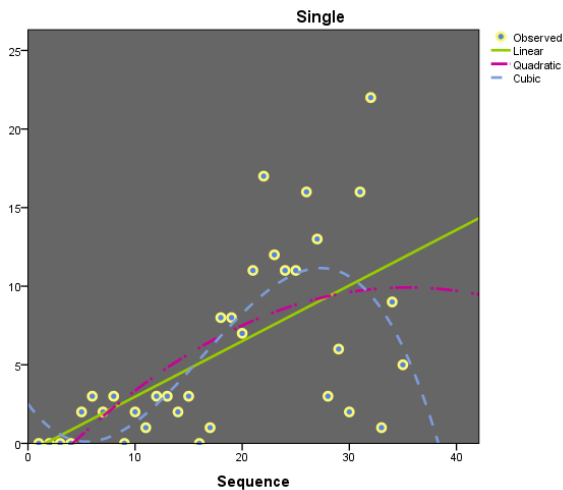
Figure 4.14. Chart of Regression models for single caregivers

The cubic function for single caregivers is the most fitting. It is significant (R^2 = 0.490, $F(3, 31)$ = 9.927, $p < 0.0001$). The regression equation is $y = 2.519 - 0.945x + 0.104x^2 - 0.002x^3$. The predicted values according to the equation show a very gradual, to unchangeable, increase overtime.
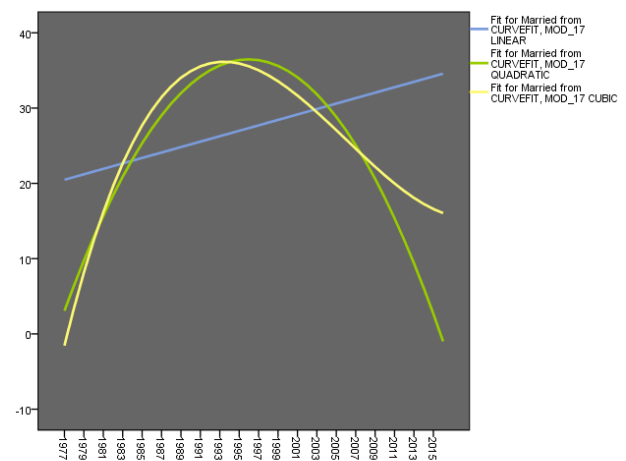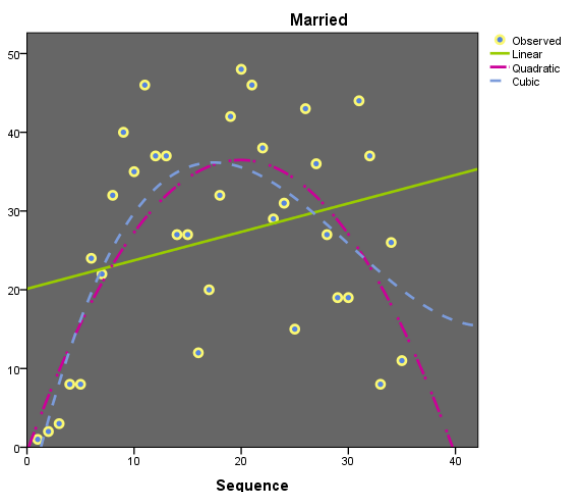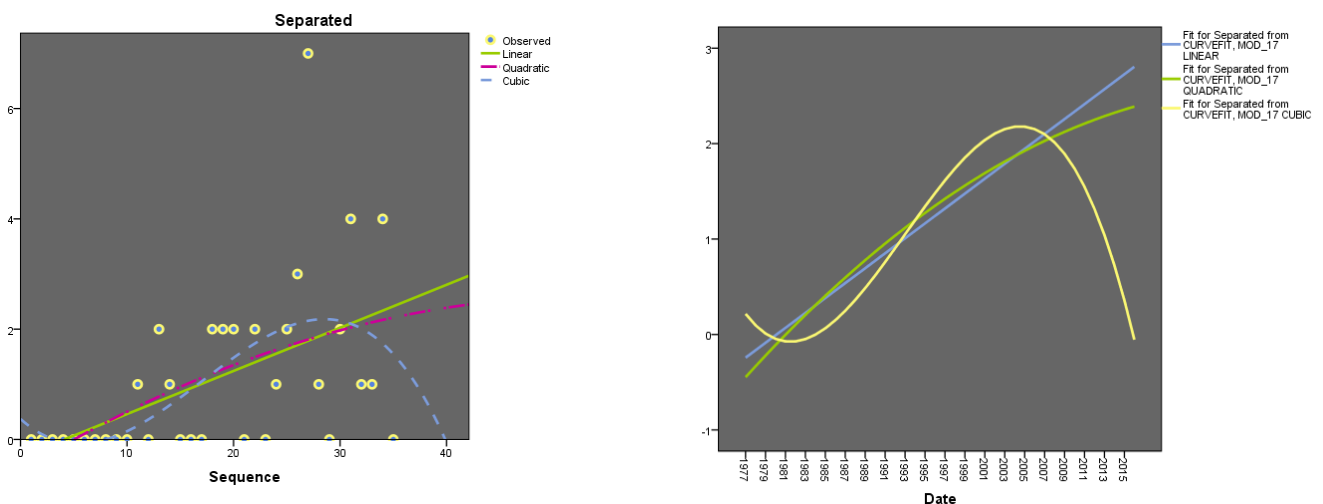

Figure 4.15. Chart of Regression models for married caregivers

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The quadratic function for married is most fitting. The model is significant (R^2 = 0.457, $F_{(2, 32)}$ = 13.476, $p < 0.0001$) with a regression equation of $y = -0.546 + 3.713x - 0.93x^2$. The predicted quadratic function in the sequence chart above shows a decrease in the number of married caregivers by 2016. The forecast confidence limits also demonstrate this trend. The number of married caregivers seems rather constant between January 1981, through to the end of captured data.
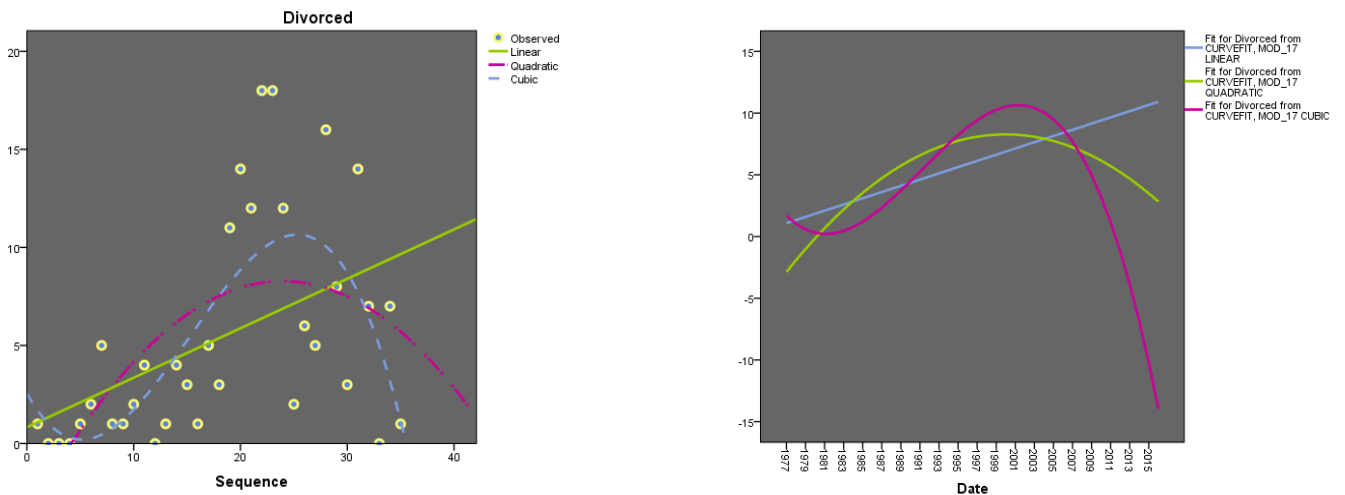
Figure 4.16. Chart of Regression models for divorced caregivers

The cubic function for divorced is most fitting. The model is significant (R^2 = 481, $F_{(3, 31)}$ = 9.573, $p < 0.0001$) with an equation of $y = 2.563 - 0.988x + 0.116x^2 - 0.003x^3$. The quadratic function shows a gradual decline predicted for 2016. The number of divorced caregivers increases from January 1996, with a slight decline in trend from January 2001.

Figure 4.17. Chart of Regression models for separated caregivers

The regression for engaged is not significant.

The Holt's model used to estimate the forecast for separated caregivers illustrates a linear trend, with no seasonality. Further, the linear regression is most suited to the separated data series. The model

is significant, with an equation of y = -0.321 + 0.078x. Linear regression shows a slight increase predicted for 2016. There is an increase in separated caregivers around May 1994. This peaks in May 2009.

These figures show a general increase in separated caregivers projected for 2016, and a very gradual decrease in the number of married caregivers. Given that the majority of CFC attendees are White, and given the history of Apartheid, and the high level of family cohesion dated back to the 1970's, the figures above make sense (Dyer, 2012). Children of single parents are reported to have double the prevalence of psychological disorders than those born to married parents (Batty, 2006). In fact, 16% of children from single-parent families compared to 8% from two-parent families are reported to suffer from a mental illness (Willacy, 2013). Boys, more than girls, are reported to have psychological difficulties as a result of parents who have split (Batty, 2006). Problems include social difficulties, ill-discipline and educational difficulties (Willacy, 2013). Children from divorced homes presented with more psychological difficulties, than those from intact homes (Christopoulus, 2009). Of the psychological difficulties presented by children from divorced homes, more presented with somatic disorders, and depression. These findings suggest that children of single parents have a higher need for psychological services. These findings are however confounded by the fact that, perhaps, children of two-parent headed households have coupled income, and can therefore afford to attend private, more expensive, psychological service providers.

However, the number of separated parents is predicted to increase. Coupled with this, is the need for psychological services will increase to specifically address this problem.

With rising need for psychological services, what will follow is a temporal analysis of the availability of medical aid to address these needs.
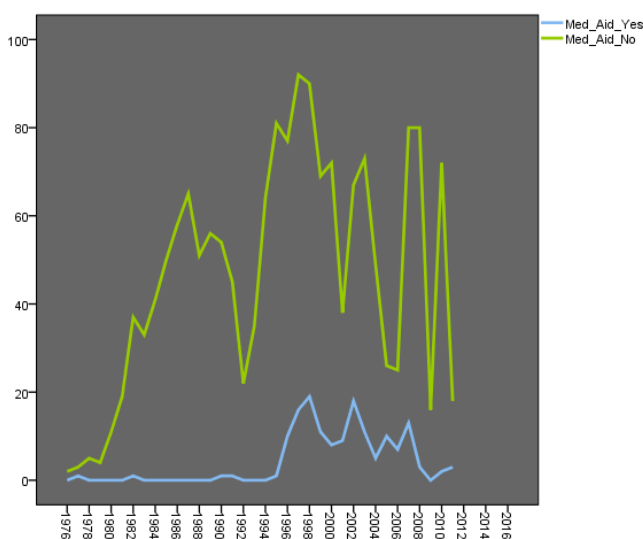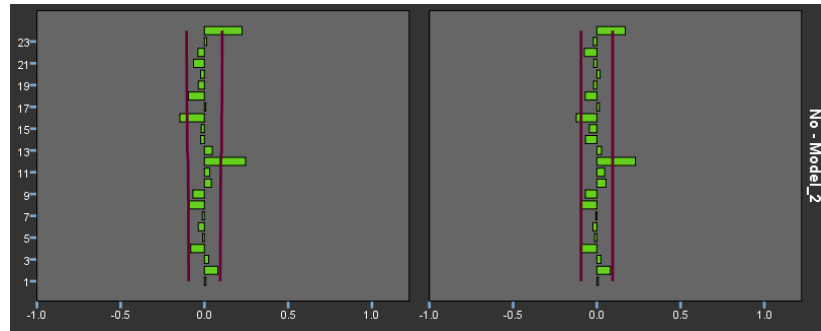
4.1.5.   Medical Aid

In terms of Medical Aid, 91.9% of all attendees were not covered by Medical Aid, compared to a mere 8.1% having Medical Aid (n = 1974). This is consistent with the CFC's approach to treating those most in need of psychological services, and who can least afford it. Most CFC attendees do not possess a Medical Aid. Medical Aid use only emerged around 1996, and has showed a steady incline up until roughly 2008. This is in line with CFC objectives to service those individuals who

Figure 4.19. Sequence chart of Medical Aid

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Table 4.5

Time series models chosen to forecast Medical Aid use

			Model Type
Model ID	Yes	Model_1	Simple
	No	Model_2	ARIMA(0,1,2)

Figure 4.20. ACF and PACF's for no Medical Aid

The best fitting models chosen for Medical Aid was the simple model for those who had Medical Aid, and used it, and an ARIMA model for those who did not. The former was used as the data showed no trend, nor seasonality. The ARIMA model was used with 0 orders of autoregression, 1 order of differencing, and 2 orders of moving averages. This meant that the model for no Medical Aid was differenced once to make it stationary by removing the linear trend from the data. MaxAPE revealed that the largest error for each model falls between 0-20%. The model for no use of Medical Aid was significant (R^2 = 0.248, Q' (16) = 55.875, p < 0.0001). ACF and PACF reveal significant spikes at lags 12 and 24, which is expected of monthly data.
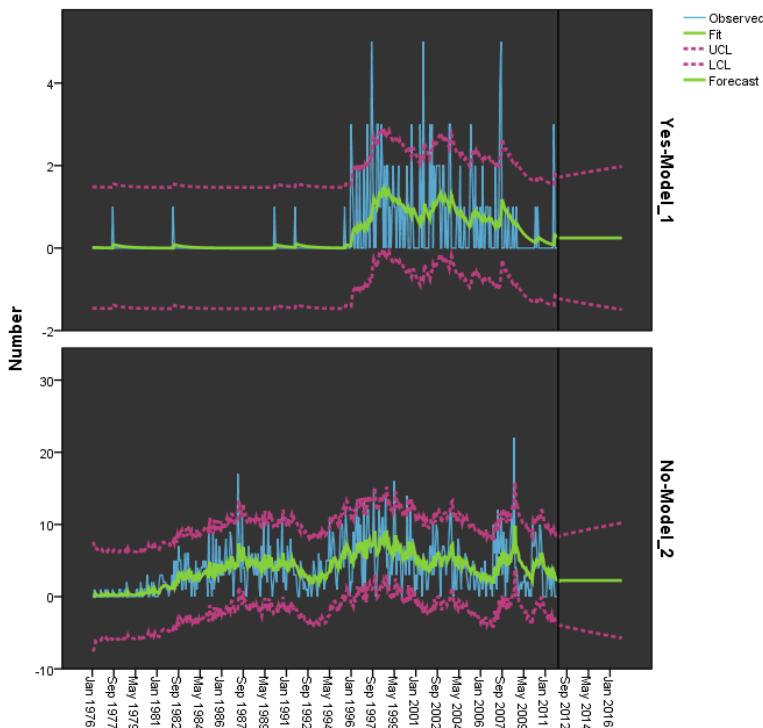
Figure 4.21. Chart forecasting use of Medical Aid

From the predictive model, the lack of use of Medical Aid seems fairly constant since September 1982. The model for the use of Medical Aid, despite not being significant, indicates an increase in the use of Medical Aid since September 1997. Predicted values for no Medical Aid shows a constant from the end of observed values. This constant lack of use of Medical Aid shows how CFC services offer great value as a service provider of psychological services to those in need of it, who do not have access to the funds necessary to receive it. Although mental health services are available at a primary healthcare level, as mentioned previously – most PHC's are ill-equipped to deal effectively with mental illness, and healthcare providers themselves are unsure of where these services are offered (WHO-AIMS, 2012). Further, PHC's to which mental health services have been de-institutionalised to face a lack of resources; lack of pre-established community residential care and ambulatory services to

prevent relapse, and homelessness; lack of psychiatric beds; lack of community awareness and acceptance; and staffing shortages to mention but a few. This means that there is a lack of access to effective, and affordable mental health services (Mkhize & Kometsi, 2008). This fact highlights the importance of providing affordable mental health services to children with mental health difficulties. Hence, optimising CFC performance at an affordable rate will be highly recommended.

What will follow is a presentation of all of the maps generated using ArcGIS, each presenting specific spatial aspects of CFC client data. Firstly, the client distribution throughout the CFC will be presented, thereafter, presenting problems.

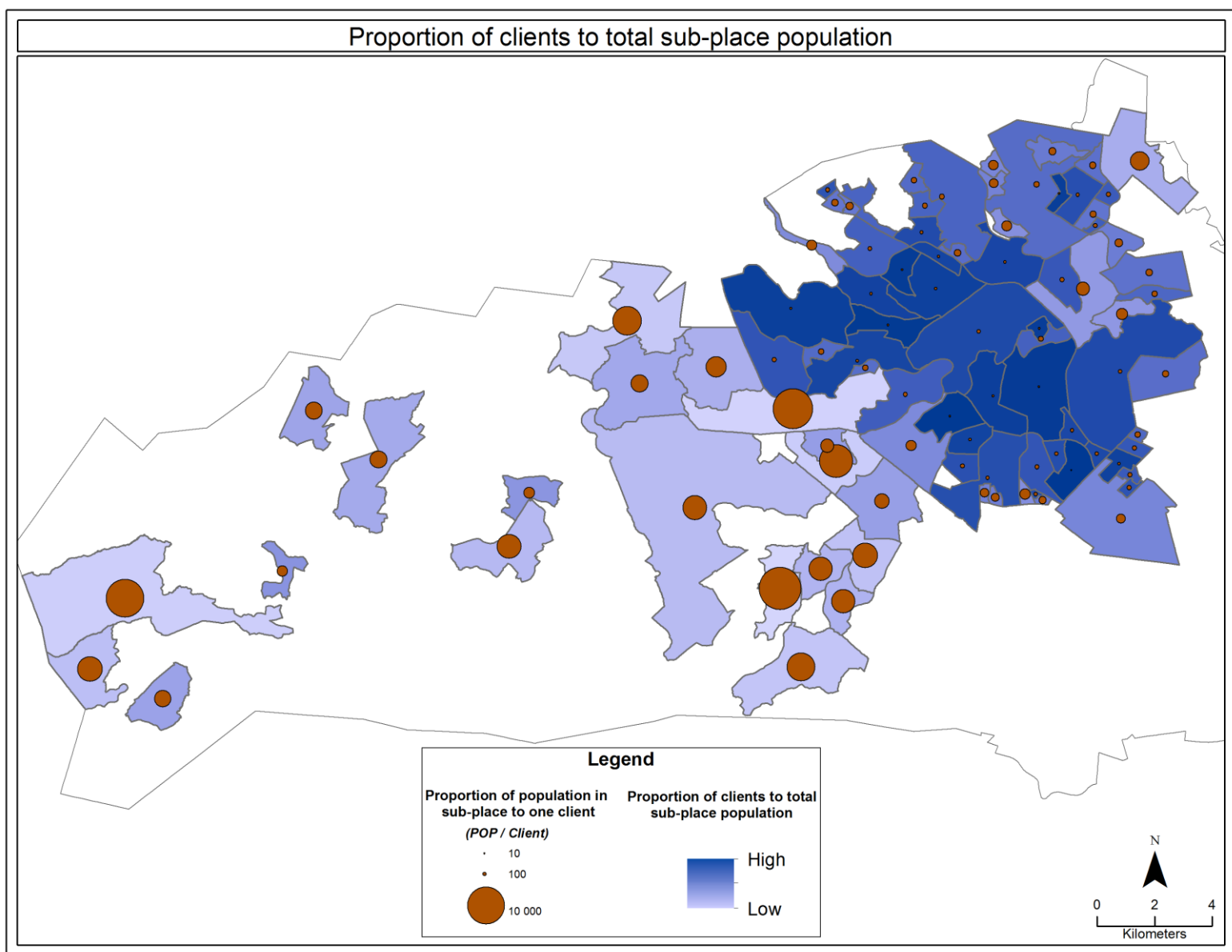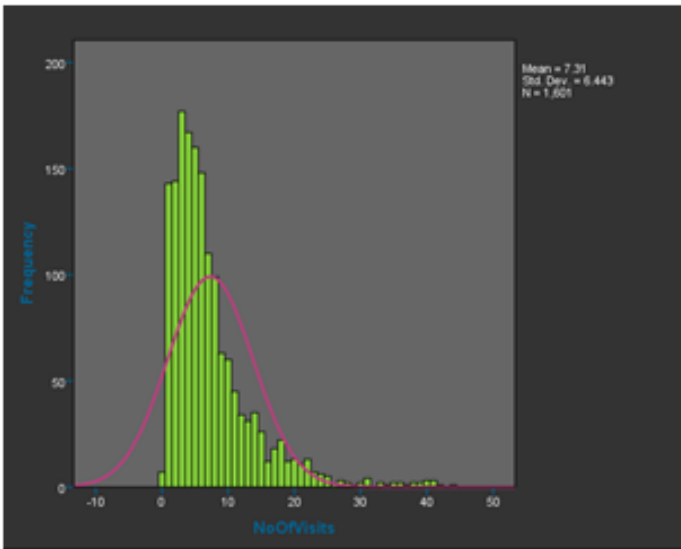### 4.1.6. CFC Client Distribution throughout the Msunduzi Region

Figure 4.22. Map indicating the proportion of clients to total sub-place population

A majority of CFC attendees come from sub-areas close to the CFC, and the Pietermaritzburg CBD.

The average number of CFC consultations are 7, with a standard deviation of 7 consultations (n = 1602).

**Figure 4.23.** Histogram indicating the average number of visits per year
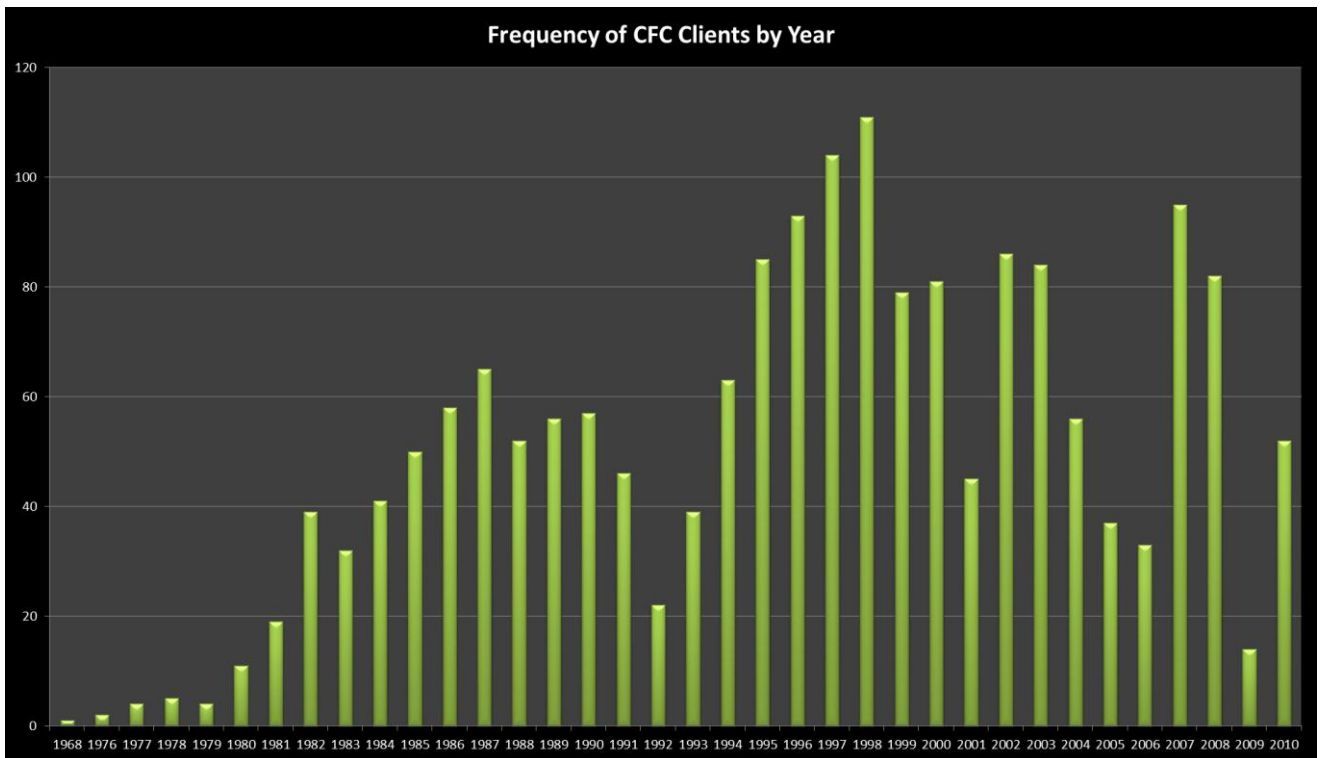
Figure 4.24. Bar chart indicating the frequency of CFC clients per year

According to figure 4.24, the highest frequency of clients are from 1998 (n = 111); followed by 1997 (n = 104); then 2007 (n = 95); then 1996 (n = 93); then 2002 (n = 86); then 1995 (n = 85); 2003 (n = 84); 2008 (n = 82); 2000 (n = 81); and 1999 (n = 79). This means that more than half of the sample (54.6%) falls between 1995 and 2008. This could be due to an increase in referrals and attendance.
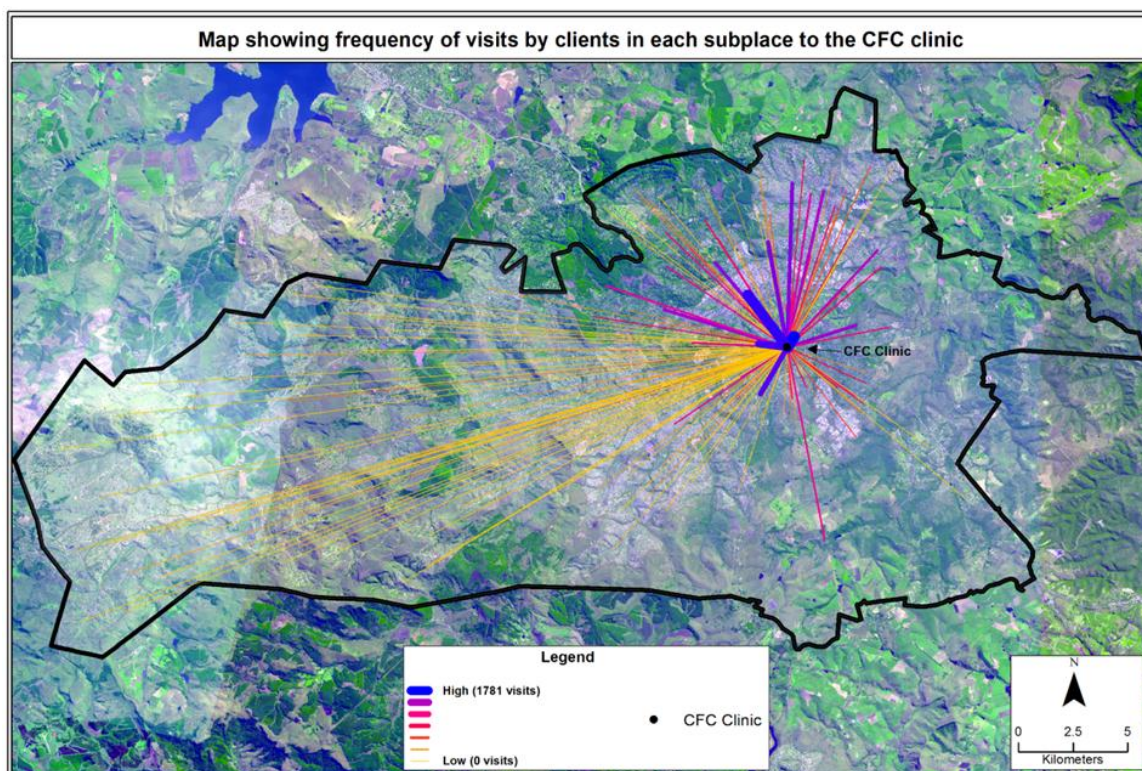
4.1.5.1. CFC service user distribution and service reach
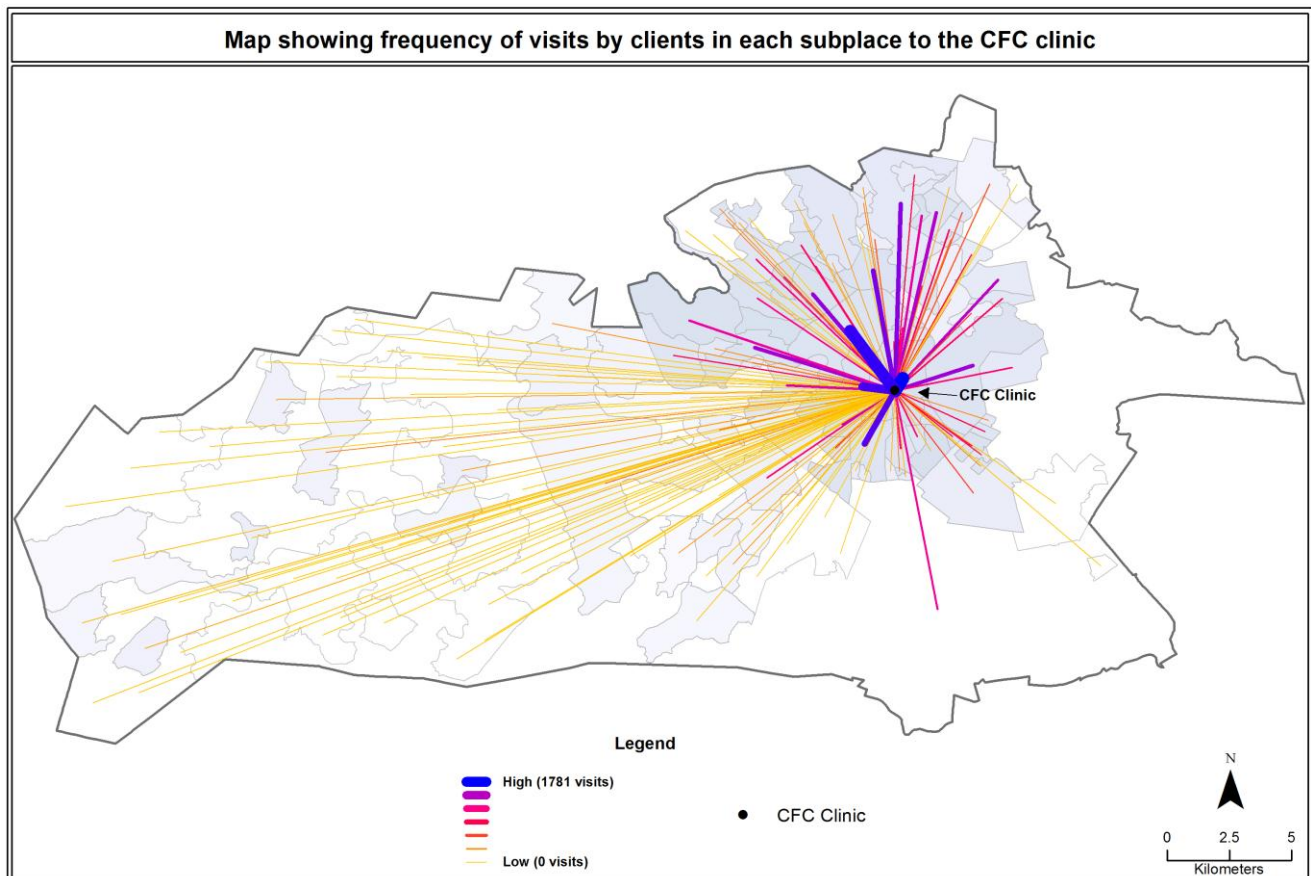
Figure 4.25. Frequency rose diagram indicating the number of clients per sub-place and the frequency of visits per client

The frequency rose diagram indicates both reach and frequency of visits. From the rose diagram, it is apparent that the closer the respondent resides to the CFC, the more frequent their consultations. Conversely, the further away, the lower the frequency. But this phenomenon could also be due to a bias in the sample as a result of lacking geographical information when the database was exported from Access, and presents a significant limitation to this study.


Figure 4.26. Frequency rose diagram mapped over a map of population and building density, and indicating the number of clients per sub-place and the frequency of visits per Client

According to the above map, this pattern could be seen as a result of issues of access. However. due cognisance should be given to the fact that what we are seeing may be a confound of referral patterns of CFC interns located in schools closest to the CFC. However, if access were to be considered as a cause, and given that the more distant areas are more rural, then it could be seen that the more rural the area from which the client is from, the fewer the consultations. According to the literature (Penchansky and Thomas, 1981), access could hamper frequency of consultations due to numerous factors including: transport difficulties; poor road condition and infrastructure; and lack of funds to take public transport (accessibility) amongst others. Edendale and Imbali, traditionally reserved for Black persons, have suffered arrested development since inception of Apartheid (Dyer, 2012) with the effect of a poorly developed infrastructure. These factors, coupled with untargeted CFC programs, may be the reason for hampered access to the CFC.

The importance of accessing these rural areas cannot be over-emphasised, as it is these areas that are faced with multiple contributory factors, for example traumatic events, violence, extreme poverty, and harsh living conditions, which exacerbate mental health difficulties (Peterson *et al.*, 2009; Okasha, 2002; Havenaar et. al., 2008; Mavundla, Toth & Mphelane, 2009). Therefore it is imperative that these areas receive sufficient access to mental health services.

Let's examine the effect of place and frequency of consultations.

4.1.5.2. Frequency of consultations per client
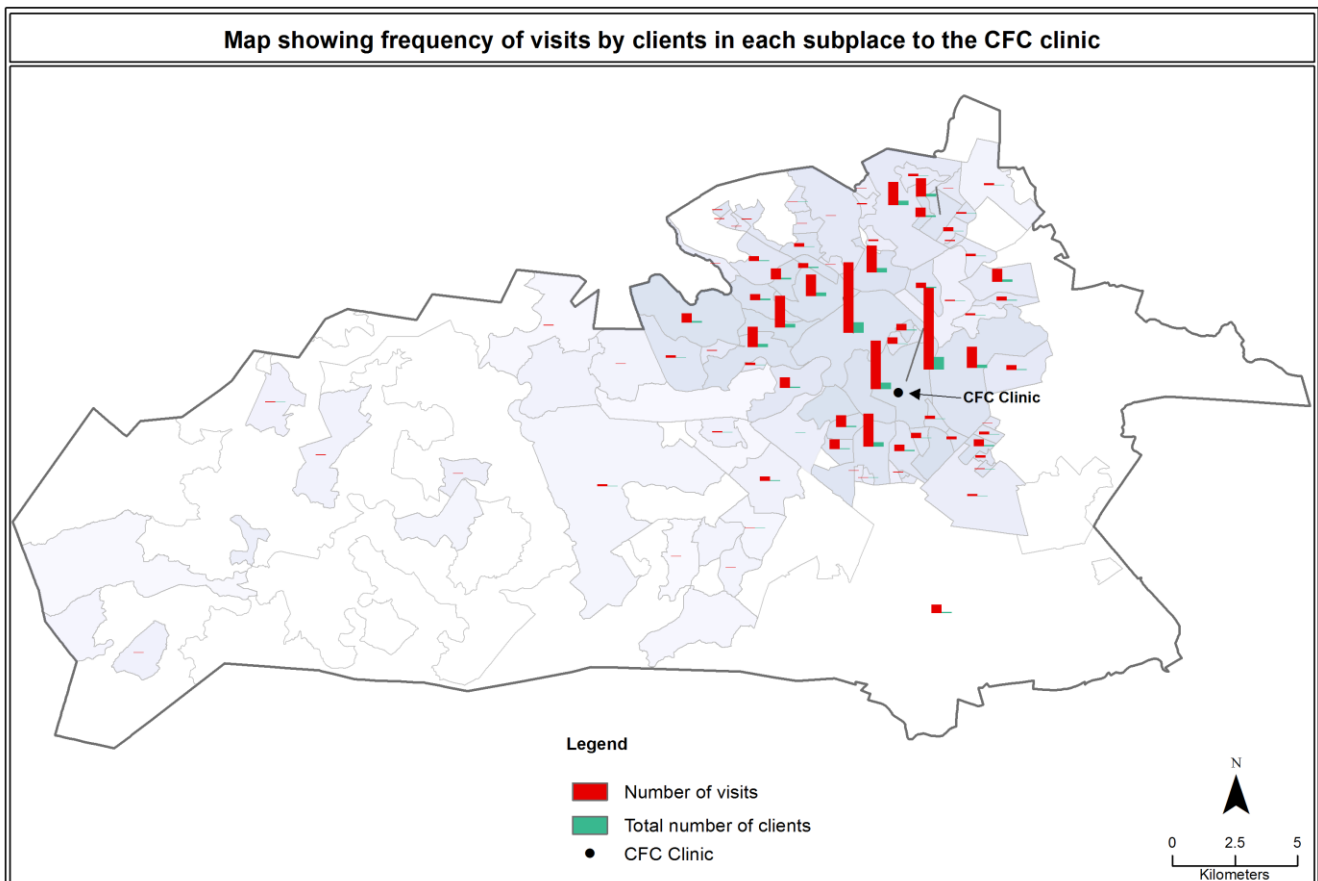
Figure 4.27. Map indicating the frequency of visits per sub-place per year

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This map is a slight variation of the previous map which indicates, through the use of bar charts, the number of clients and visits from the various sub-areas in the Msunduzi district. Again, it is evident from this map that the highest frequency of visits came from those clients residing closest to the CFC. The highest numbers of clients attending the CFC came from sub-areas closely surrounding the CFC.

Again, it is difficult to discern if this pattern is attributable to artifacts relating to referral characteristics and trends, or if it is due to issues of access. If we were to hypothesize reasons beyond referral artifacts, one would look to previous racial segregation policies in explaining client distribution. The patterns seen in this map resonate with previous racial segregation characteristics of the socio-political history of PMB. Scottsville, and more central areas were traditionally White; the northern suburbs Indian, to the east Coloured, and to the West predominantly Black. Although there was a good degree of migration from traditionally Black Bantustans to the more Indian and Coloured areas, it seems from the above map that traditional demarcation still persists. The lack of attendance from more distant areas could be due to numerous reasons. Included is the lack of access and accessibility (roads, funds, distance); lack of knowledge (implying poor outreach on the part of the CFC); or perhaps cultural barriers to service uptake (Peterson *et al.,* 2009) amongst others.

CFC users from the more distant areas, such as Edendale, Imbali and Vulindlela show very poor to non-existent CFC attendance. These areas, as mentioned previously, have been significantly underdeveloped, and still face difficulties in obtaining basic services (Dyer, 2012). In essence, these communities are said to be rural. In rural areas, 41% of pregnant women (three times the prevalence in developed countries) are reported to experience depression. KwaZulu-Natal has the highest reported HIV prevalence in the population aged 15-49 years (DoH, 2012). HIV/AIDS is a significant contributor to mental ill-health. This highlights a dire need to access these communities and provide psychological health services. This is especially important in light of the current disjuncture between national policy (decentralising psychological health services to PHC facilities) and what is actually happening on the ground (Peterson, 2009).

Given change naturally occurring overtime, let's examine the effect thereof on referrals received per area, client residence as per referral letter, gender, race, school attended.

4.1.5.3. Temporal changes in clients per year
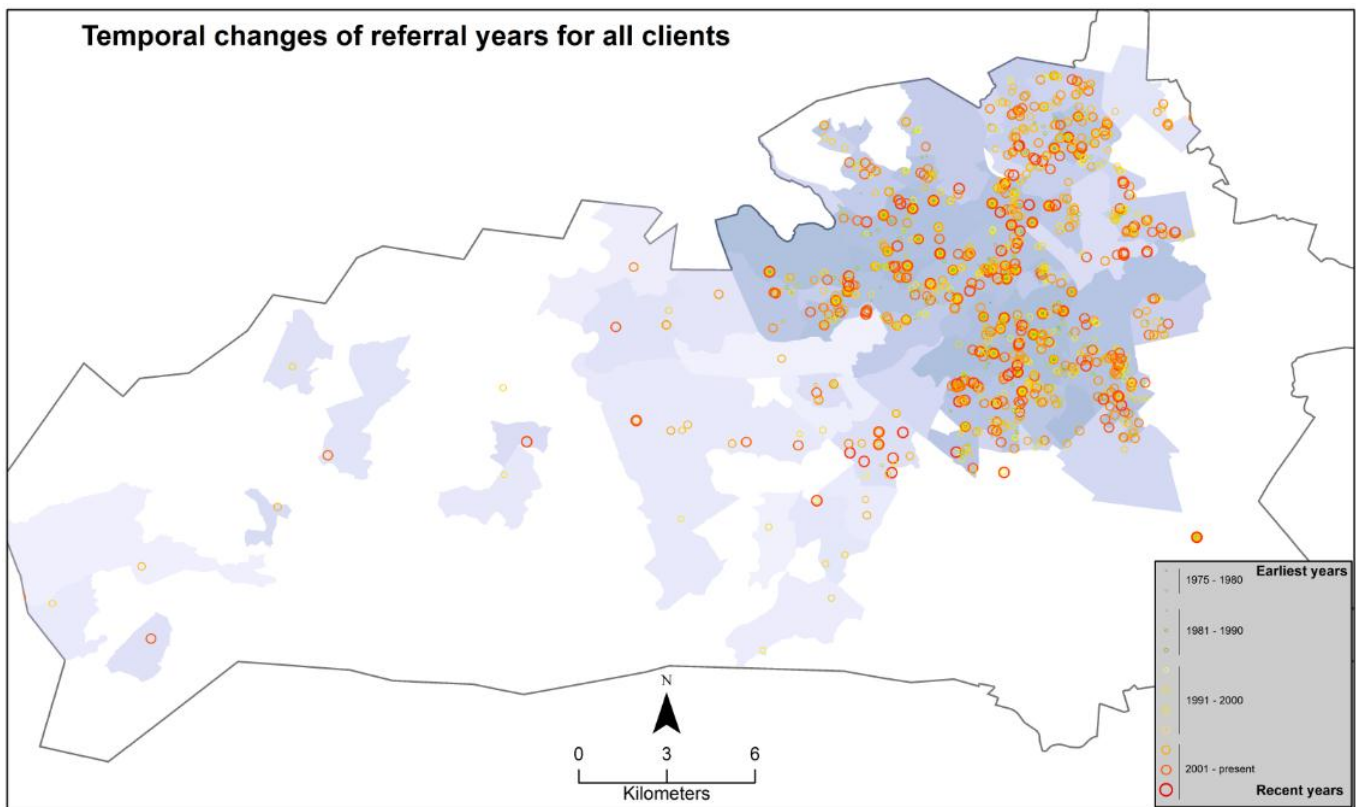
Figure 4.28. Map indicating temporal changes in referral years for all CFC clients

The darker circles represent more recent years, and lighter circles earlier years closest to CFC inception. From the map it is evident that most of CFC clients are close to the vicinity of the CFC. There has been a slight dispersion in latter years (subsequent to 2000). The spread to outer areas in more recent years is very slow.

These previously disadvantaged areas continue to bear the burden of a history marked with violence, discrimination and significant underdevelopment. It is imperative that the psychological repercussions thereof be examined, and services rendered. A targeted resource approach to psychological service provision must be expanded to the previously under-serviced outlying areas as mental health institutions are usually situated in predominantly White areas (Vogelman, 1990) as in the case in PMB. Poverty inhibits access to education, health, and shelter (KZN Department of Safety and Liaison, 2010). Given that these low levels of education exist in impoverished areas, and considering that a majority of referrals came from schools, this may explain the lack of access and service uptake from these rural areas, and the tremendous academic difficulties reported. In addition, as a result of the Bantu Education Act of 1956, many parents are inadequately equipped to assist their children with homework, and rural areas particularly are still faced with inadequate educational facilities and quality of educational services Youth Group Fact Sheet, 2011).
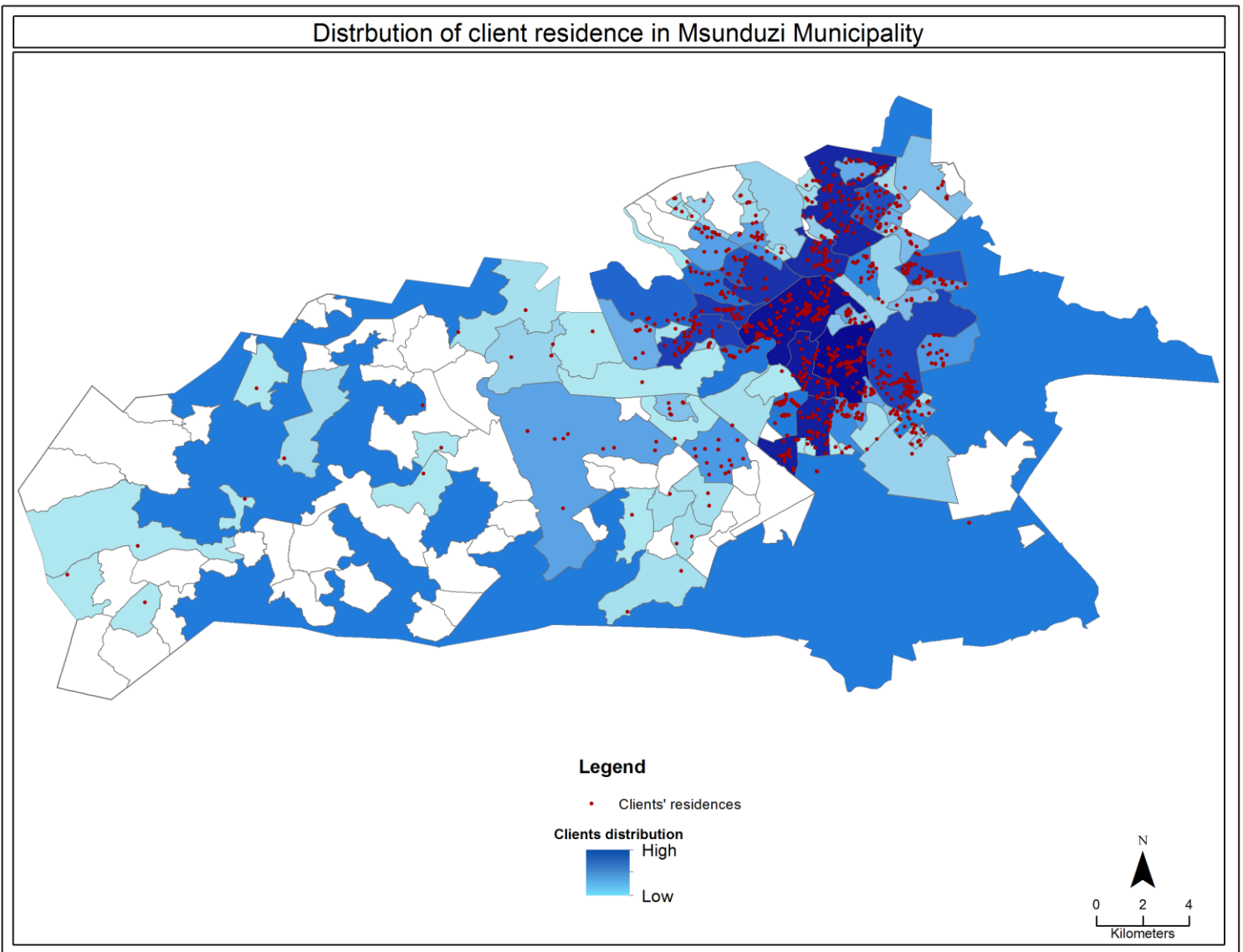
Figure 4.29. Map indicating client's residence throughout the Msunduzi region

The map of clients' residence indicates similar findings to previous ones in that most clients reside in areas close to the CFC. These areas are most commonly traditionally White areas (Dyer, 2012). The majority of the sample is White, this map confirms that there has been very little spread of White people to other areas. As discussed in the literature review, the central, southern and northern areas have largely been reserved for residences. White people predominantly occupied the central areas, Indian people in the north, Coloureds in the east and Black in the western areas (Dyer, 2012). There have been a few CFC clients from Edendale (South West of the PMB CBD), which is vitally important as this community has historically been subject to trauma, violence, and other atrocities. There has been very few CFC attendees from the Vulindlela region. The roads and infrastructure is significantly

under-developed in this area (Msunduzi Municipality, 2009). Access may be of big concern. Marsh & Meacher (1979) reinforce this notion by saying that poor accessibility often results in poor service-uptake.

4.7.   Gender

Males constituted 58% of the sample, and were 42% female (n = 1922); with a median of 1.00 (males). It is positively skewed, meaning the majority of the distribution lies to the left, favouring males.
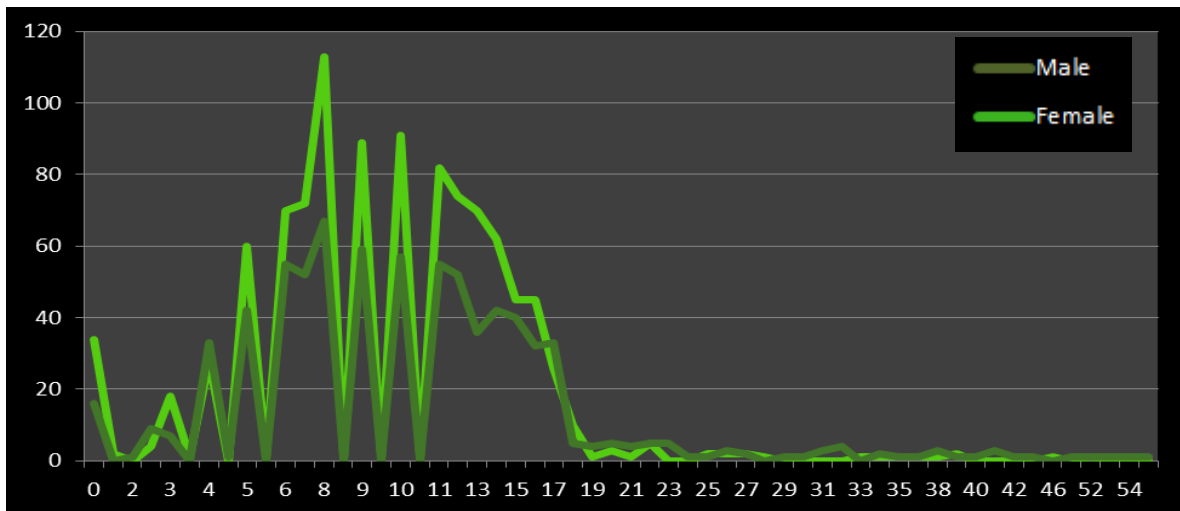
Figure 4.30. Line chart indicating the average number of males and females attending the CFC by age
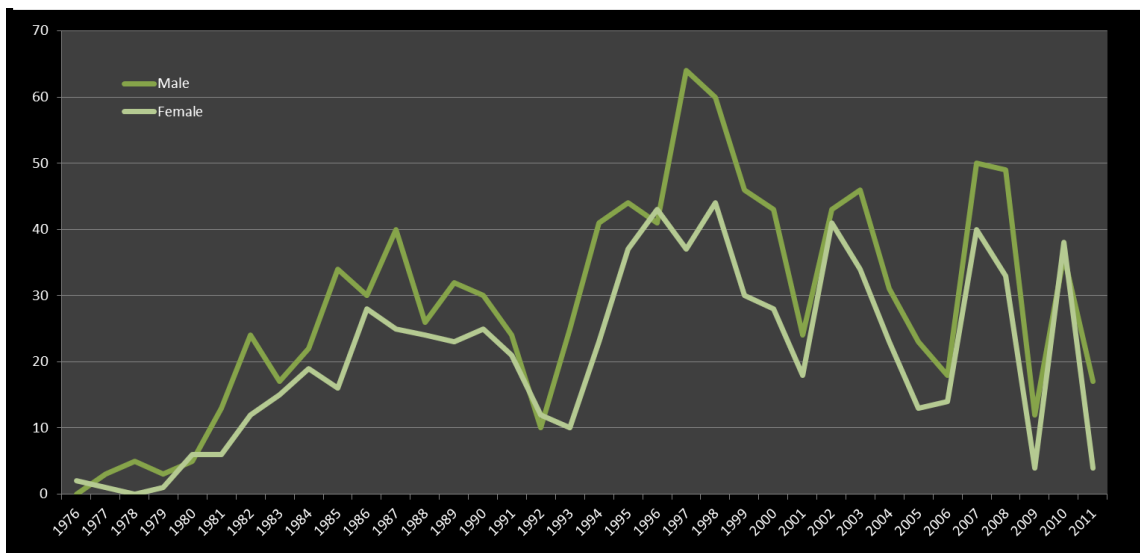
Figure 4.31. Line chart indicating the average number of males and females attending the CFC by year

According to the sequence chart, boys presented with more difficulties than girls between the ages of 4 and a half to 18 years. Girls are said to suffer from more mental illnesses as they get older. This is reflected in the chart above, as the number of problems reported decreases dramatically after 19 years of age. However, girls after this age attended the CFC more so than boys.

The sequence chart above demonstrates that overall, the frequency of males attending the CFC has been higher than their female counterparts since 1977. Female attendance only surpassed males in 2009.

There is a significant increase in both males and females post-1994.
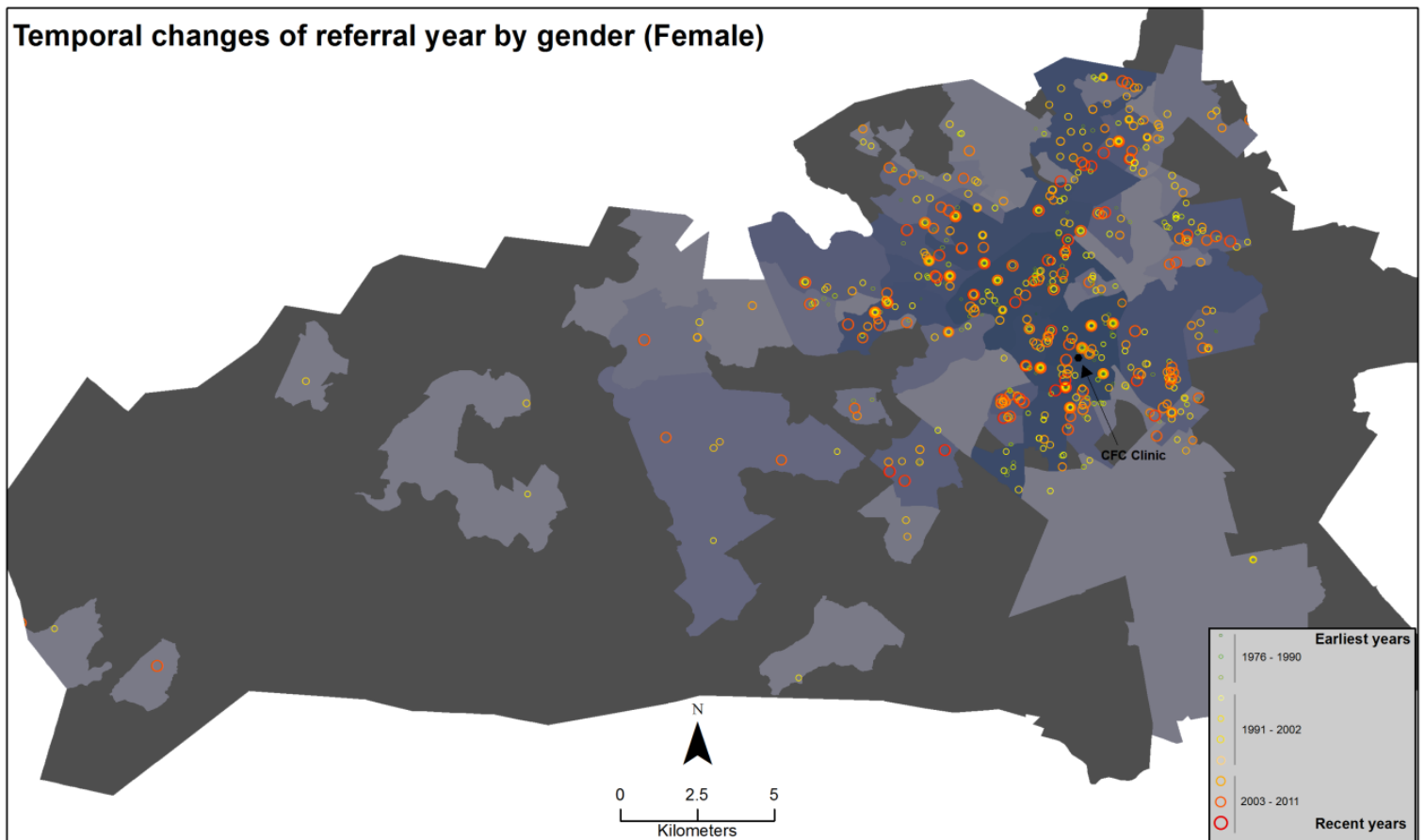
Figure 4.32. Map indicating temporal changes by referral year per gender

As witnessed in the previous maps, there has been a movement to more distant surrounding sub-places in recent years. This is further demonstrated in this map. There has been an increase in female attendees in more recent years (2003 and upwards). A similar pattern of an influx of males in more recent years is evident from the above map.

There is a significant difference in females ($F_{(1, 34)} = 52.377$, $P < 0.0001$) over time (in years). Post hoc tests reveal significant differences in females between: 1976 and 1995 – 1998, 2002-2003, 2007-2008 and 2010; 1977 and 1995-1998, 2002-2003, 2007-2008 and 2010; 1978 and 1995-1999, 2002-2003, 2007-2008 and 2010; 1979 and 1995-1998, 2002-2003, 2007-2008 and 2010; 1980 and 1995-1998, 2002, 2007 and 2010; 1981 and 1995-1998, 2002, 2007 and 2010; 1982 and 1996, and 1998; 1992 and 1996, and 1998; 1993 and 1996, 1998, 2002, and 2007; 1995 and 2009, and 2011; 1996 and 2006, 2009 and 2011; 1997 and 2009 and 2011; 1998 and 2006, 2009 and 2011; 2002 and 2009 and 2011; 2003 and 2009 and 2011; 2005 and 1996, and 1998; 2007 and 2009 and 2011; 2009 and 2010; 2010 and 2011. These differences seem to occur mainly between later and former years as

there was an increase in females over time. Female CFC attendees started increasing after 1994. Reasons for this trend are unknown.
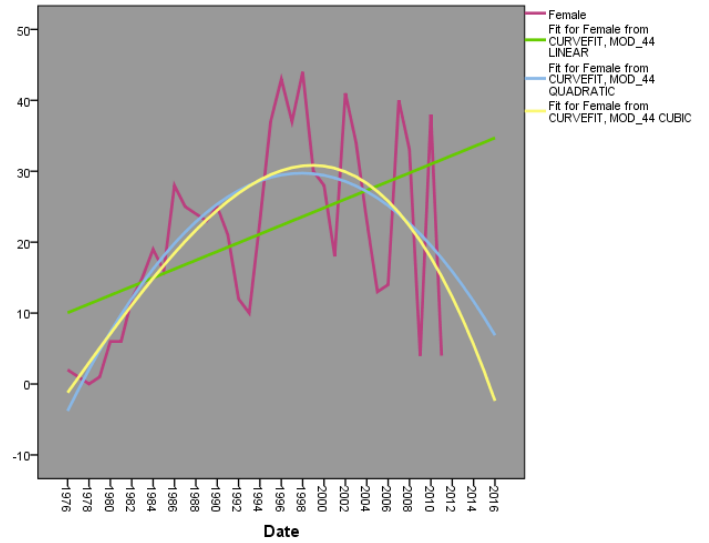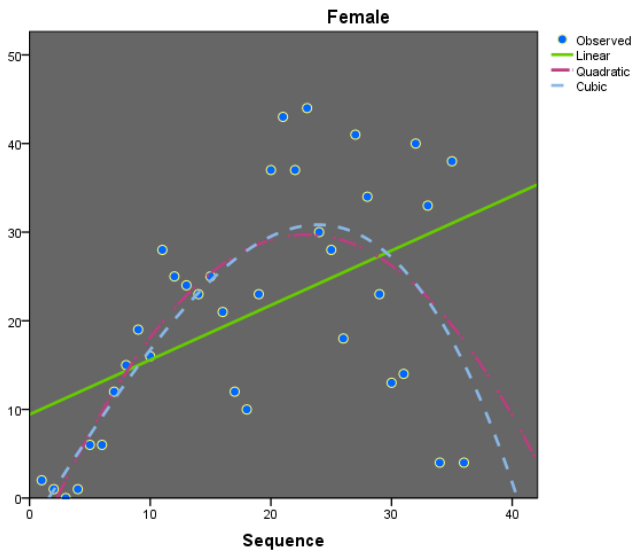
The quadratic equation for females attending the CFC is significant ($R^2 = 0.500$, $F_{(2, 33)} = 16.480$, $p < 0.0001$). The equation is $y = -6.934 + 3.200x - 0.070x^2$. This equation shows a low starting point, increase, and a slight predicted decline.
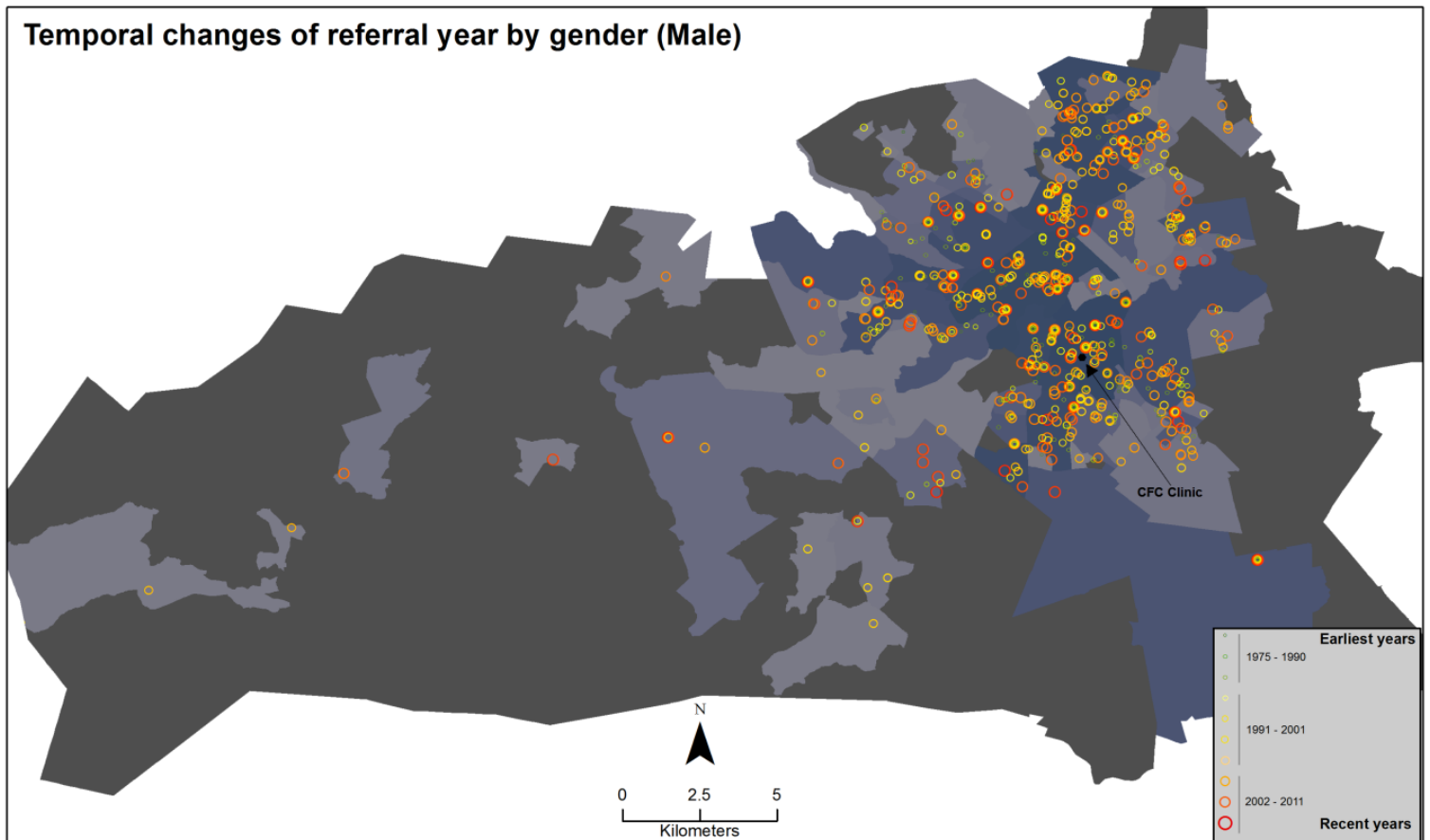

Figure 4.34. Map of temporal changes in male CFC attendees

A similar pattern of an influx of males in more recent years is evident from the above map. There is a significant difference in males ($F(1, 34) = 5.457$, $p < 0.0001$) over time (in years). This significant difference in males attending the CFC exists between: 1976 and 1987, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2002, 2003, 2007, and 2008; 1977 and 1995, 1997, 1998, 1999, 2000, 2002, 2003, 2007, and 2008; 1978 and 1997, 1998, 1999, 2003, 2007, and 2008; 1979 and 1995, 1997, 1998, 1999, 2000, 2002, 2003, 2007, and 2008; 1980 and 1997, 1998, 1999, 2003, 2007, and 2008; 1981 and 1997, and 1998; 1983 and 1998, 1992, 1998, and 2007; 1997 and 1976 – 1984, 1992, 2001, 2005, 2006, 2009, and 2011; 1998 and 1976 – 1981, 1983, 1992, 2006, 2009, and 2011; 2007 and 1992. These differences occur mainly between former and later years as was evident with female CFC attendees, except that the difference in male attendance seem clustered around pre- and post-apartheid.
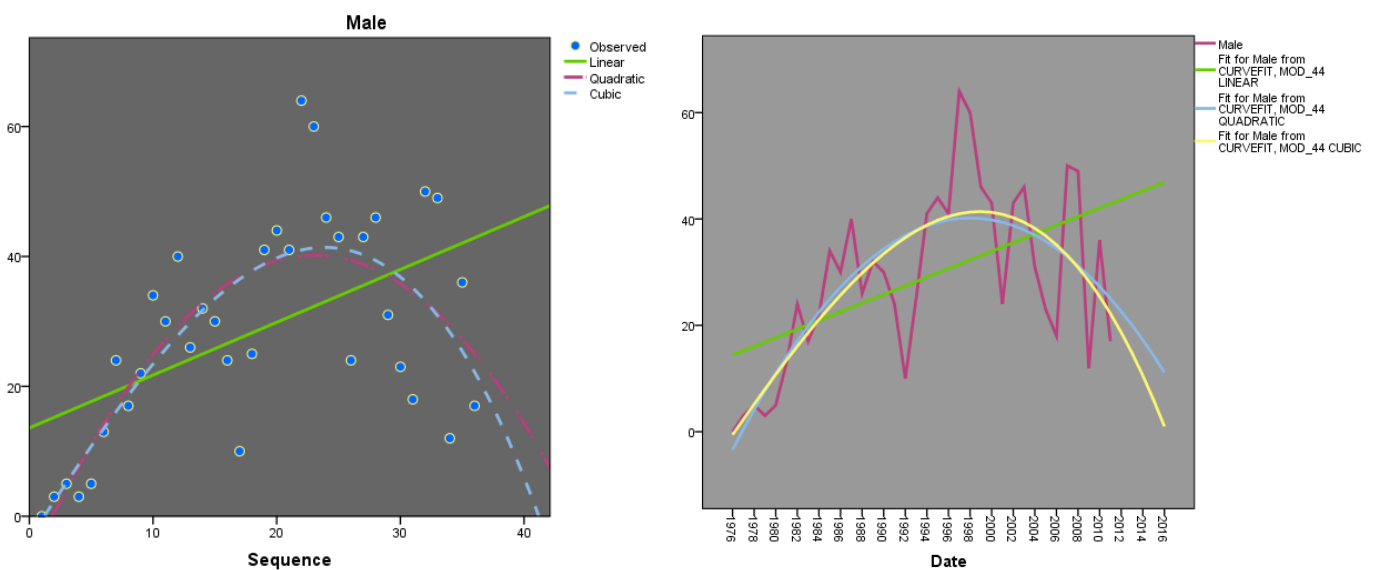
Figure 4.35. Chart of Regression models for male CFC attendees

The quadratic function for males attending the CFC is significant ($R^2 = 0.551$, $F(2, 33) = 20.259$, $p < 0.0001$). The equation is $y = -7.455 + 4.137x - 0.090x^2$. There seems to be a gradual decline in the number of males attending CFC around 2010.
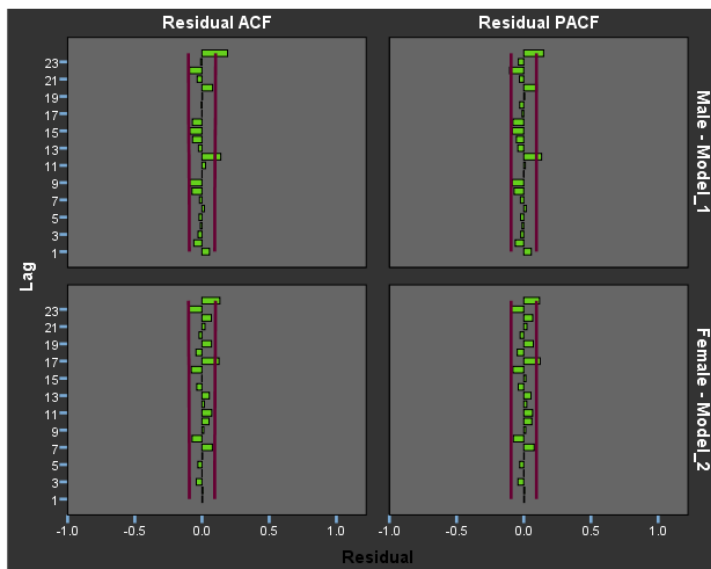

Table 4.6.

Time series models chosen to forecast gender

		Model Type
Model ID Male	Model_1	ARIMA(1,0,16)
Female	Model_2	ARIMA(1,0,12)

The best fitting models chosen for gender were ARIMA models, with 1 order of autoregression, 0 orders of differencing, and 16 orders of moving averages; and with 1 order of autoregression, 0 orders of differencing, and 12 orders of moving averages. The 0 d values indicate a lack of trend in the data for gender. MaxAPE revealed that the largest error for each model falls between 2-8%. All models are significant ($R^2 = 0.132$, Q' (17) = 38.515, $p < 0.002$); and ($R^2 = 0.430$, Q' (17) = 26.475, $p < 0.0.066$).

The ACF and PACF indicate an alternative exponential decline for males, with a significant peak at 13, 21, and 23. Females show an exponential incline, with peaks at lags 7, 17, and 24.

Figure 4.36. Residual ACF and PACF for CFC client gender
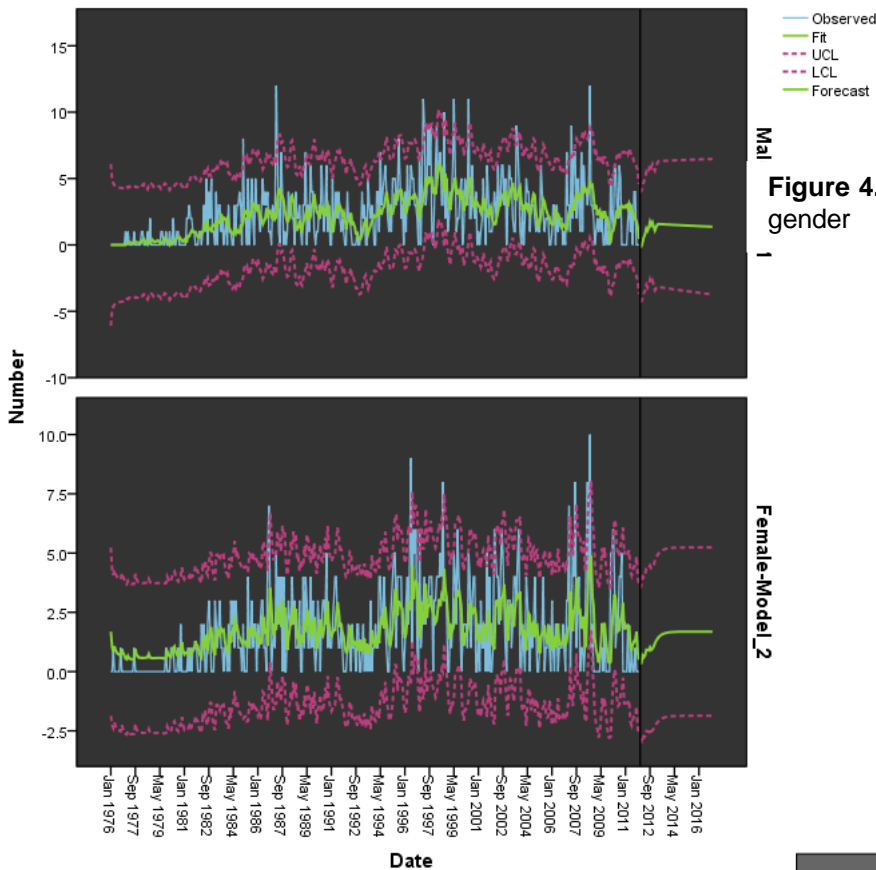
Overall, there has been a higher attendance of males over time than females. Male attendance peaked [...] males attendees to 2016. Female attendees have consistently attended the CFC since January 1996, with a recent decline in January 2011. The predictive model, however, shows an incline in female CFC attendees onto 2016.

4.8. Race

Black persons showed a linear, upward trend, as per the sequence plot, and the scatterplot. This irregular increase will be further explored using the Curve Estimation. There has been a gradual decline in the number of White CFC attendees, roughly since 1996. Mainly White people attended the CFC from inception until
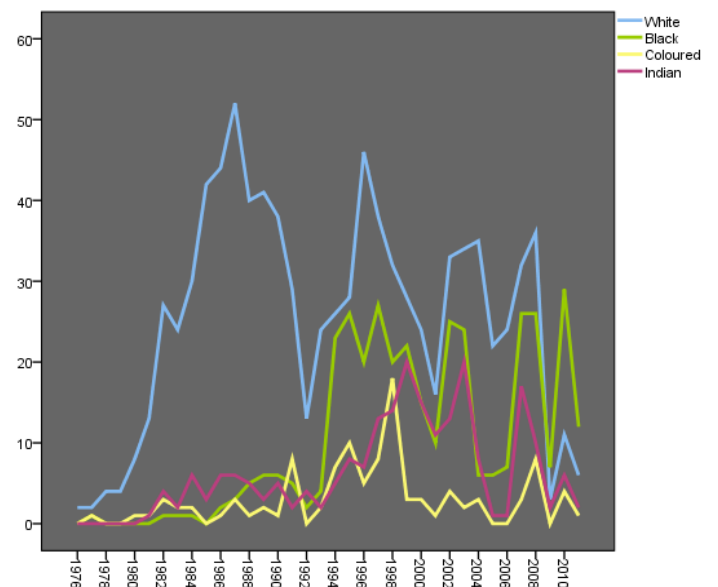
Figure 4.38. Sequence chart of client's race over time

1993, and were only surpassed by Black attendees around 2009.

Table 4.7.

Time series models chosen to forecast gender

Model ID			Model Type
	White	Model_1	Simple
	Black	Model_2	Simple
	Coloured	Model_3	Simple
	Indian	Model_4	ARIMA(1,0,11)

Figure 4.39. Residual ACF and PACF for CFC client race

The best fitting models chosen for initial consultation with was the simple model as the data showed no trend, nor seasonality. The ARIMA model was used for Indian attendees with 1 order of autoregression, 0 orders of differencing, and 11 orders of moving averages. The lack of differencing in the ARIMA model demonstrates the lack of trend in the data for Indian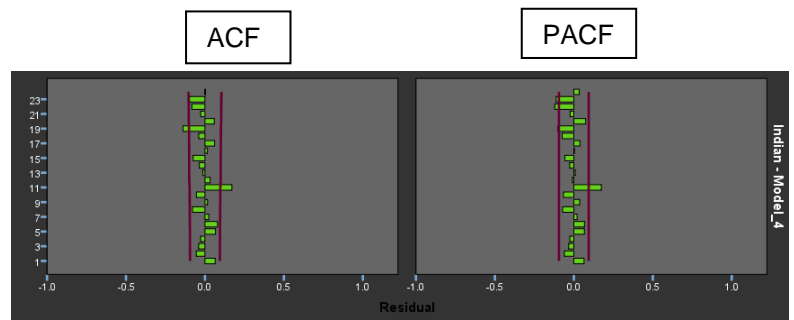s, and the model was insignificant. The ARIMA model for Indian attendees, looking at the ACF and PACF, reveals an exponential decline, 11 significant negative peaks.

All models are significant except for Indian were significant (R^2 = 0.180, Q' (17) = 57.384, p < 0.0001); (R^2 = 0.238, Q' (17) = 46.136, p < 0.0001); (R^2 = 0.147, Q' (14) = 28.003, p = 0.045); (R^2 = 0.199, Q' (17) = 17.154, p = 0.310). White CFC attendees show a decline in numbers since May 2009, and the lower limit is predicted to decline even further. Black CFC users only started attending the CFC in January 1986, and showed a rapid incline from May 1994. Since then, there has been a steady increase in Black CFC attendees. Coloured CFC attendees have had intermittent attendance since inception, however showed a slight incline in January1996, which tapered down again in January 2006. The model predicts a decline as per the lower limit, and a constant, low attendance until 2016.

Figure 4.40. Forecast models of respondents race over time

As previously mentioned, Black CFC attendees only started attending the CFC around 1995. They were the only race shown to have an increasing trend. Subsequent to 1995, it is evident from the map that there has been an increase of males from more distant areas since 1997. 2003 showed a marked increase in Black CFC attendees mainly from the Southern and Western sub-areas. It is interesting to note that, unlike other CFC demographic patterns, there seems to be an increase in Black CFC attendees in more recent years from more central areas. The more distant areas were mainly accessed in former years, and more central in latter years. This shows an inward migration of Black people post 1997. To test the hypotheses:

H_o: There has been no change in client demographic as the South African socio-political climate has changed

H_i: There has been a change in client demographic as the South African socio-political climate has changed

$P < 0.05$, therefore we reject the null hypothesis and conclude that there has been a change in client demographic as the South African socio-political climate has changed ($F(3, 1609) = 57.781$, $p < 0.0001$). This difference is indicative of an upward trend in Black CFC attendees over time, as we move further from political dispensation in 1994. There has been an increase in the number of black attendees in schools traditionally reserved for white people, and therefore, an increase in referrals of black children to the CFC (this will be discussed further later in this chapter). In addition to this
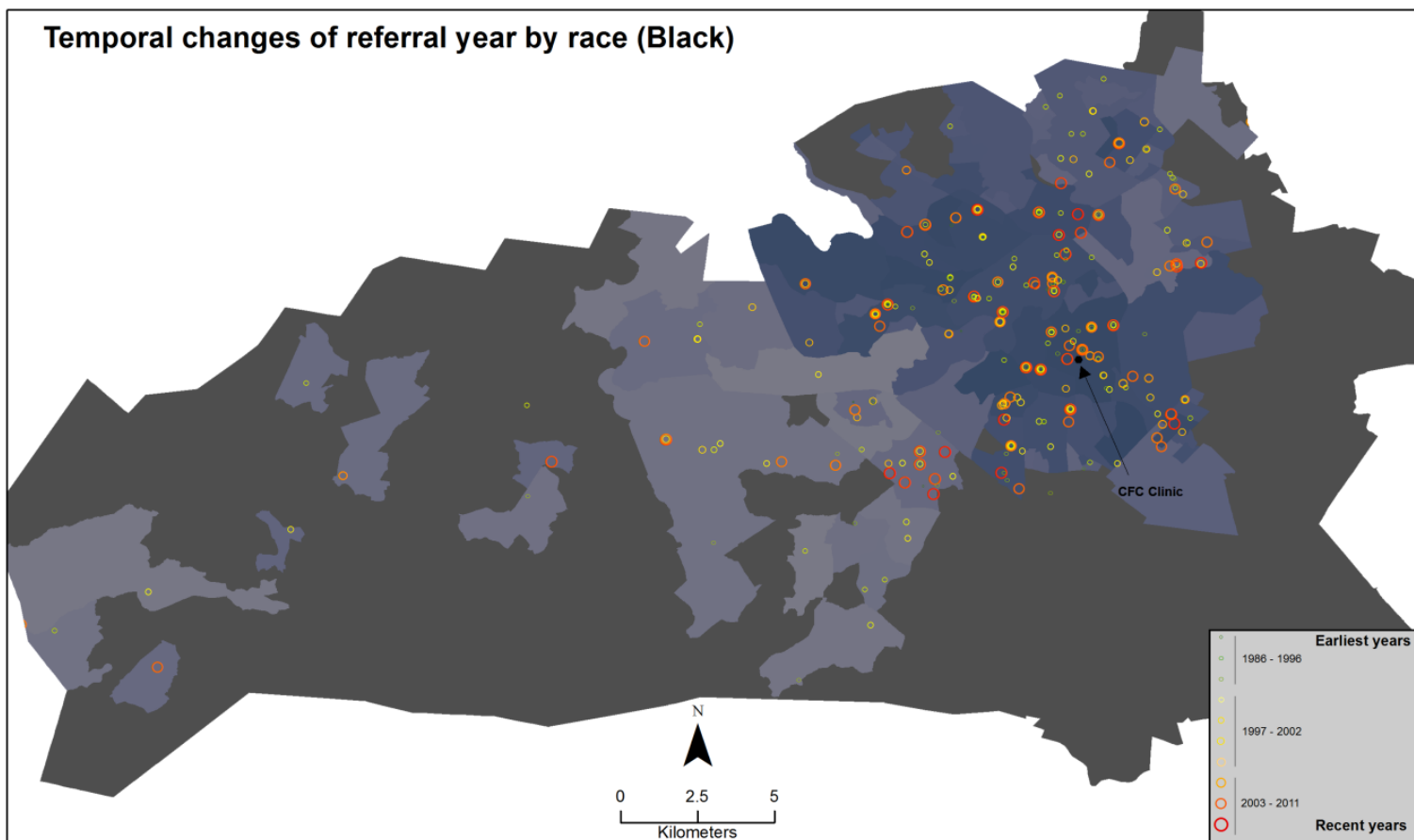
Figure 4.41. Map of temporal changes in Black CFC attendees

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phenomenon, the South African government prioritized Education in 1994. Prior to 1994, the amount spent on traditionally white schools was two and a half times more than their black counterparts in the impoverished homelands (Spaull, 2012). This highlights not only poor educational standards and facilities in rural areas, but also, the poor education received by parents of black children.

4.8.1. Black CFC attendees

Figure 4.42. Sequence chart of Black CFC attendees
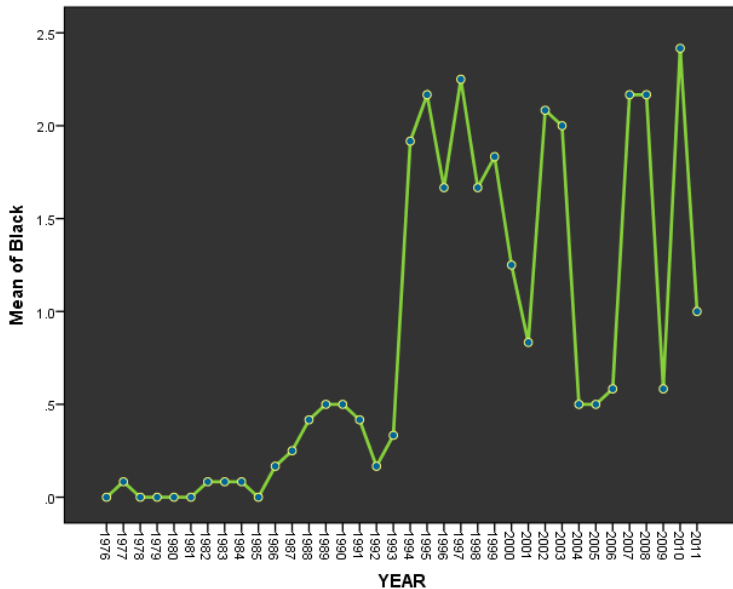
There is a significant difference in Black CFC attendees between: 1976 and 1994 – 1995, 1997, 1999, 2002-2003, 2007-2008 and 2010; 1977 and 1994-1995; 1997, 2002-2003, 2007-2008, and 2010; 1978 and 1994-1995, 1997, 1999, 2002-2003, 2007-2008 and 2010; 1979 and 1994-1995, 1997, 1999, 2002-2003, 2007-2008 and 2010; 1980 and 1994-1995, 1997, 1999, 2002-2003, 2007-2008 and 2010; 1981 and 1994-1995, 1997, 1999, 2002-2003, 2007-2008 and 2010; 1982 and 1994-1995, 1997, 2002-2003, 2007-2008 and 2010; 1983 and 1994-1995, 1997, 2002-2003, 2007-2008 and 2010; 1984 and 1994-1995, 1997, 2002-2003, 2007-2008 and 2010; 1985 and 1994-1995, 1997, 1999, 2002-2003 and 2010; 1986 and 1995, 1997, 2002-2003, 2007-2008 and 2010; 1987 and 1995, 1997, 2002, 2007-2008 and 2010; 1988 and 1997, and 2010; 1989 and 2010; 1990 and 2010; 1991 and 1997, and 2010; 1992 and 1995, 1997, 2002-2003, 2007-2008 and 2010; 1993 and 1995, 1997, 2007-2008 and 2010; 2004 and 2010; 2005 and 2010; 2006 and 2010; 2009 and 2010. These differences are a result of a sharp increase in Black CFC attendees from 1994. If you refer to Appendix C, Black CFC attendees have the highest projected attendance rate for 2016. This is understandable given the inward migration of Black people into the areas where referrals to the CFC largely came from (Dyer, 2012). The fact that the change occurred around the time of political dispensation further attests to this fact.
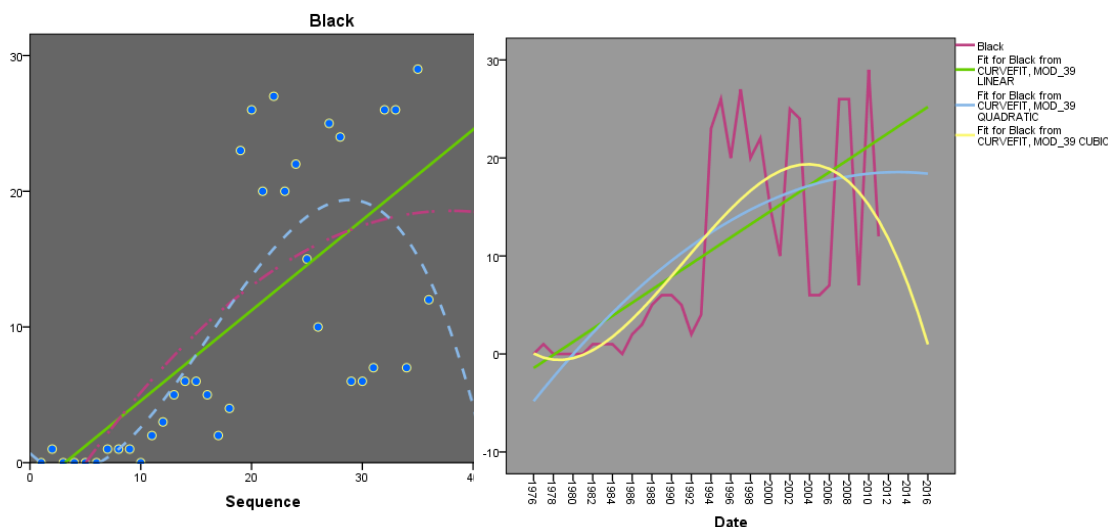
Figure 4.43. Chart of Regression models for Black CFC attendees

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The cubic function for Black CFC attendees is significant ($R^2 = 0.546$, $F_{(3, 32)} = 12.832$, $p < 0.0001$). The equation is $y = 0.693 - 0.767x + 0.121x^2 - 0.002x^3$. This equation demonstrates a gradual increase in Black CFC attendees projected to 2016. Subsequent to 1994, access to basic education has increased dramatically; with an increase of learners enrolled into grade one between 22.5% in 1996 to 45.6% in 2001 to 81.2% in 2011. There has also been an increase in Grade 9 entrants from 76% in 2002, to 86% in 2012 (ibid). For the six-year-old age group, these figures were at 49.1% in 1996, 70.3% in 2001 and 92.7% in 2011, while for the seven-year-old group they were at 73.1% in 1996, 88.4% in 2001 and 96.1% in 2011 (StatsSA, 2012). This means that a lot more students, especially black students, are receiving education compared to before 1994, and may account for the increase of black learners attending the CFC as they are attending CFC referral schools. This explains the increase in predicted black CFC attendees.

4.8.2. Coloured CFC Attendees
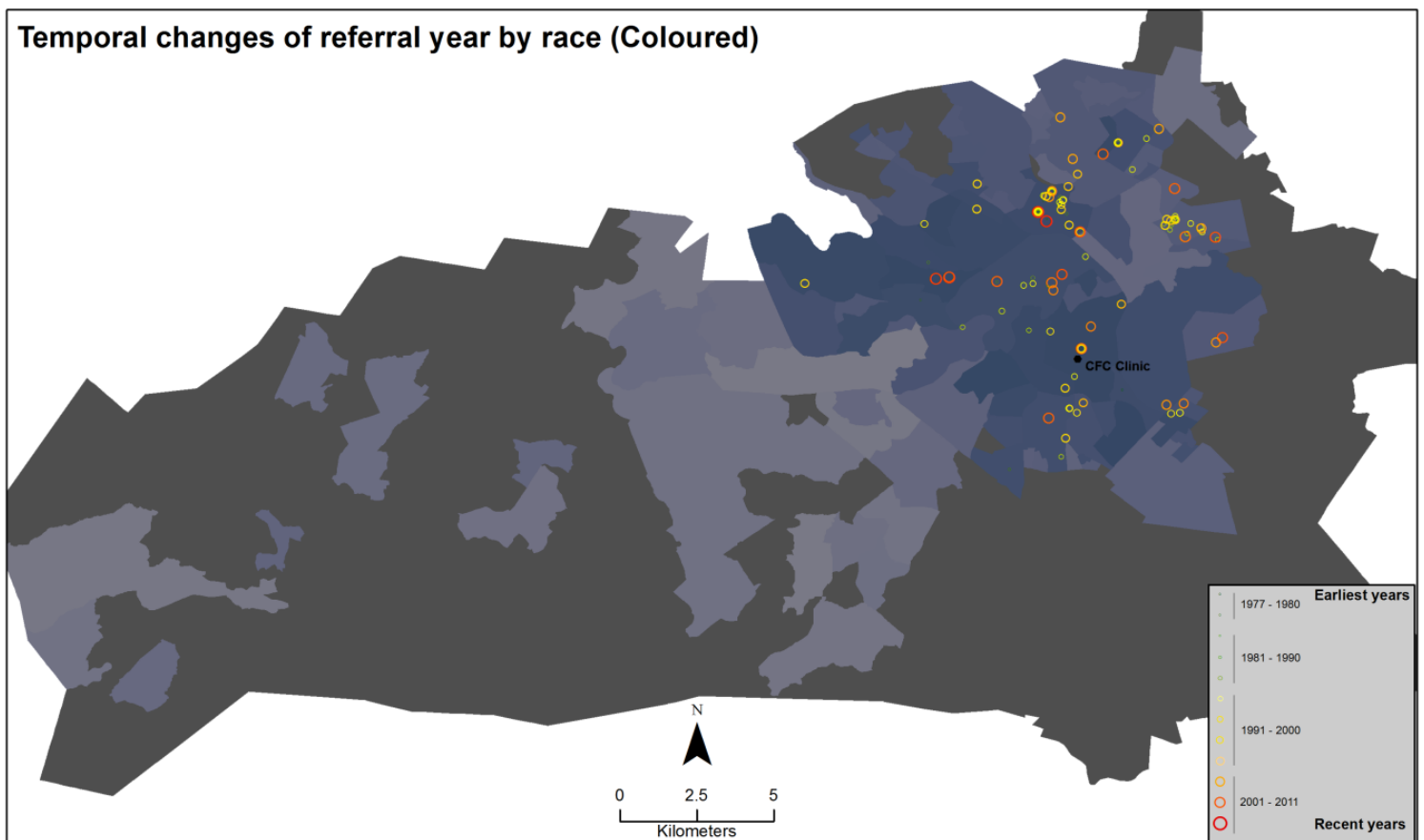
Figure 4.44. Map of temporal changes in Coloured CFC attendees

A dissimilar trend was found in Coloured CFC attendees. Former years (1970/1980) illustrated that most attendees came from all areas except the West (formerly Black area). In latter years, Coloureds seem to occupy very similar areas.
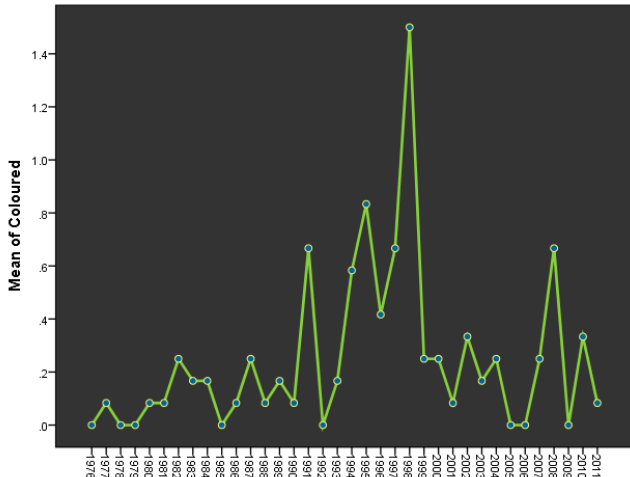
Figure 4.45. Sequence chart of Coloured CFC attendees

There is a significant difference in the number of Coloured CFC attendees between: 1976 and 1995; 1977 and 1998; 1978 and 1995, and 1998; 1979 and 1995, and 1998; 1995 and 1976 and 1978-1979, 1985, 1992, 2005-2006 and 2009; 1996 and 1997; 1998 and 1976-1994, 1996-2011; 2009 and 1995. The post-hoc tests show a difference mainly between 1995 and 2000, where there was a peak, thereafter dropping back down to previous numbers. There is a significant peak in Coloured CFC attendees in 1998, however numbers dropped back down to the baseline average thereafter. Coloured CFC attendees only started attending the CFC in 1992, steadily increasing after 1994,
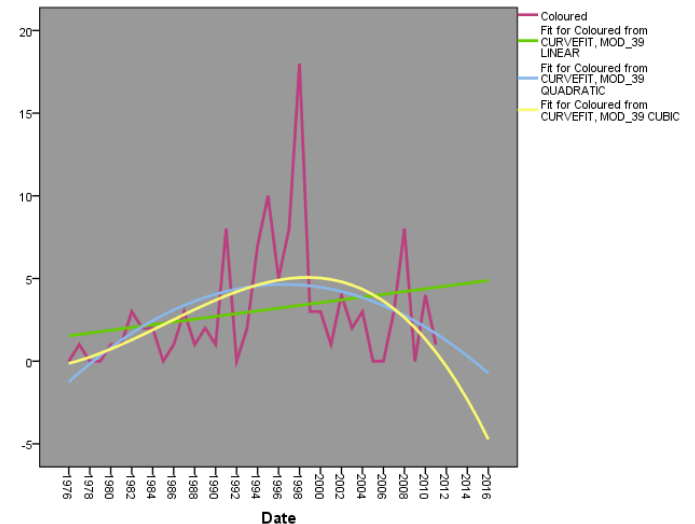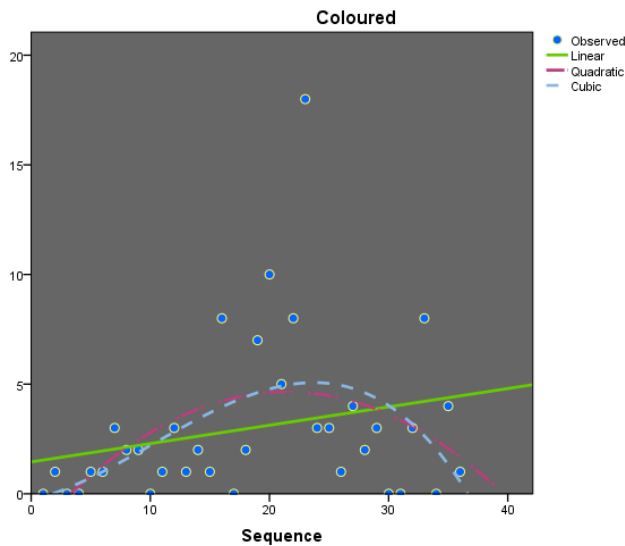
Figure 4.46. Chart of Regression models for Coloured CFC attendees

The quadratic function for Coloured CFC attendees is significant (R^2 = 0.195, $F_{(2, 33)}$ = 3.997, p = 0.028). The equation is y = -1.849 + 0.605x − 0.014x². This shows a forecast decline in Coloured CFC attendees.

4.8.3. Indian CFC Attendees
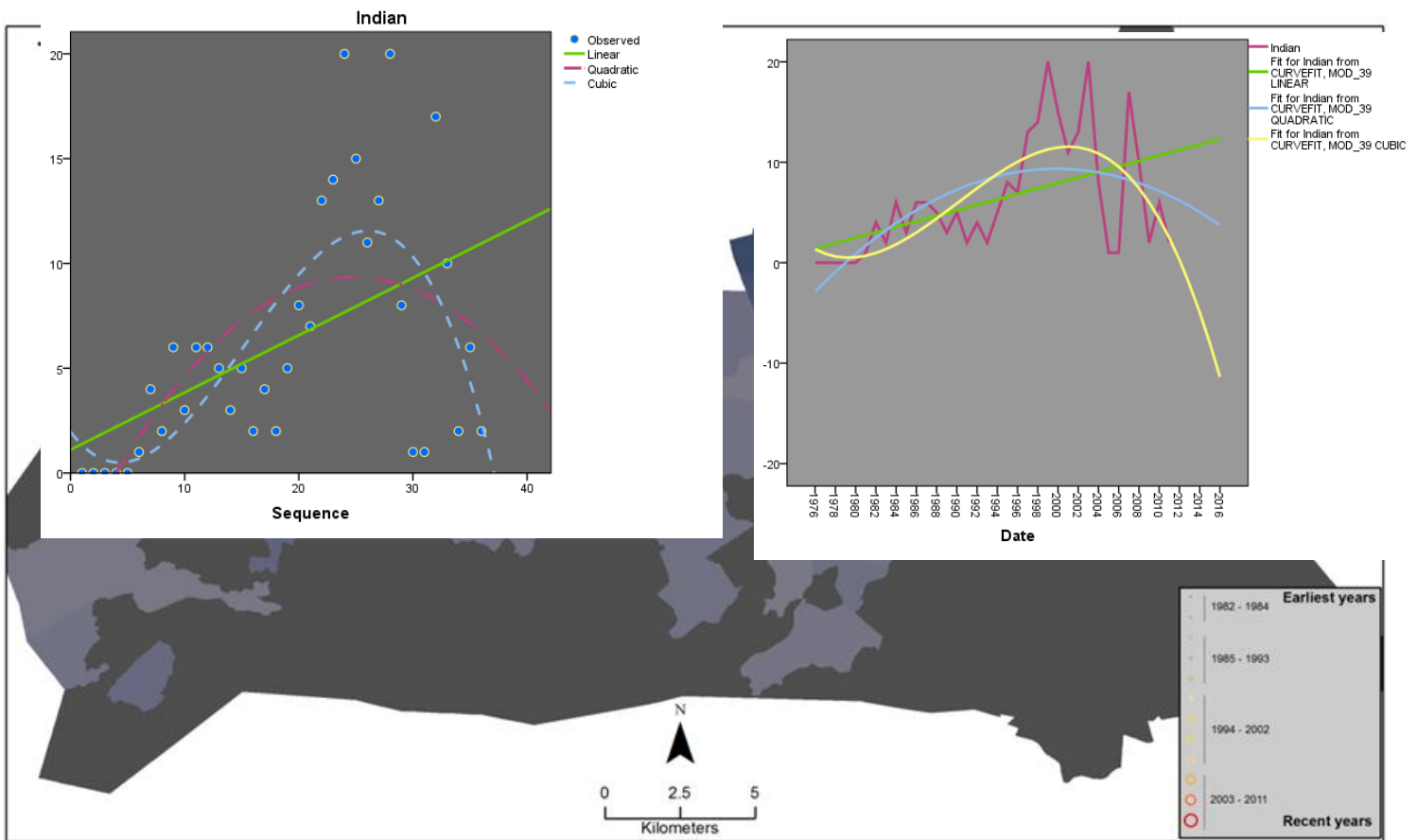
Figure 4.47. Map of temporal changes in Indian CFC attendees

It is evident from the below map that Indians have, and still tend to occupy the Northern PMB sub-areas. There were more Indians in the Southern sub-areas in former years, however a vast majority now seem to have migrated North. Post-hoc tests revealed a significant difference in the number of Indian CFC attendees between: 1999 and 1976 - 1983, 1989, 1991-1992, 2005-2006, 2009 and 2011; 2003 and 1976-1983, 1985, 1989, 1991-1993, 2005-2006, 2009 and 2011, 2005 and 2007; 2007 and 1976-1981, and 2006.

There is a significant difference between 1999 and former years as Indian CFC attendees only started attending the CFC after 1994, and more so in 1997.
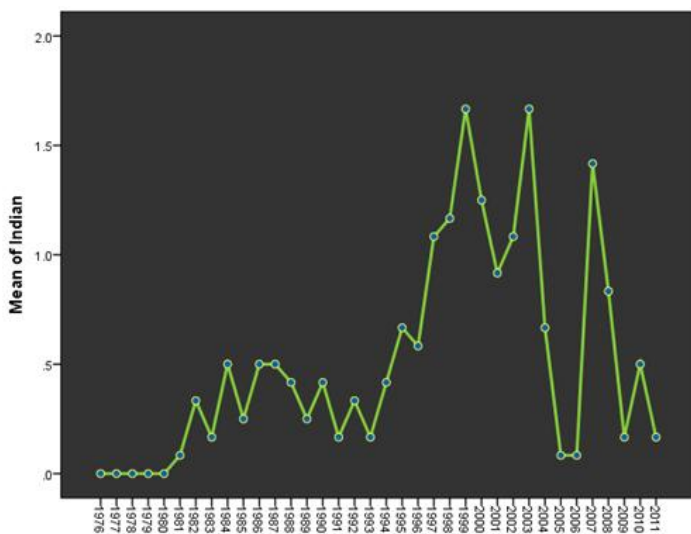
Figure 4.48. Sequence chart of Indian CFC attendees

Figure 4.49. Chart of Regression models for Indian CFC attendees

The quadratic function for Indian CFC attendees is significant ($R^2 = 0.381$, $F_{(2, 33)} = 10.153$, $p < 0.0001$). The equation is $y = -3.934 + 1.070x - 0.022x^2$. This equation shows a predicted decline for 2016. The curve fit predicted for Indian CFC attendees is predicted to decline.

4.8.4. White CFC Attendees
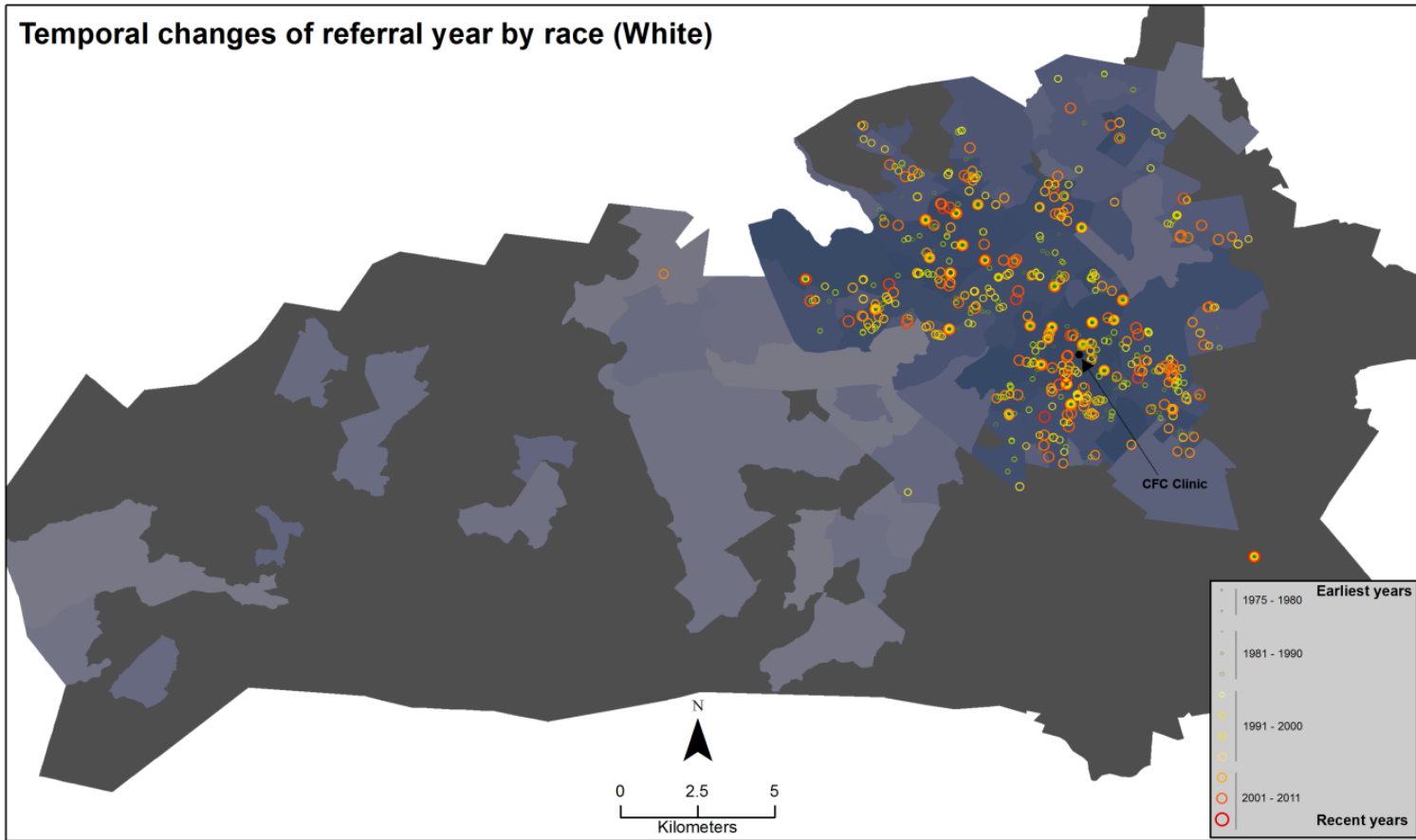
Figure 4.50. Map of temporal changes in White CFC attendees

There seems to be a light migration to the South in latter years, however, place of residence seems to have remained largely the same. There is a significant difference in White CFC attendees between:

Figure 4.51. Sequence chart of White CFC attendees

1976 and 1985-1990, 1996-1997, 1977 and 1985-1990, and 1996-1997; 1978 and 1985-1989, and 1996; 1979 and 1985-1989, and 1996; 1980 and 1986-1987, and 1996; 1981 and 1987; 1985 and 2009 and 2011; 1986 and 2009 and 2011; 1987 and 1992, 2001, 2009-2011; 1988 and 2009; 1989 and 2009; 1996 and 2009 and 2011.

These differences are accounted for by the fact that White CFC attendees peaked in 1987 – 2008, thereafter, there is a dramatic decline in White CFC attendees.

North West (Hilton area).

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Figure 4.52. Chart of Regression models for White CFC attendees

The quadratic function for White CFC attendees was significant ($R^2 = 0.507$, $F(2, 33) = 16.977$, $p < 0.0001$). The equation is $y = -1.459 + 3.872x - 0.100x^2$). This shows a projected decline.

Pre-1994	
White	464
Black	60
Coloured	35
Indian	54

Post-1994	
White	448
Black	308
Coloured	73
Indian	168
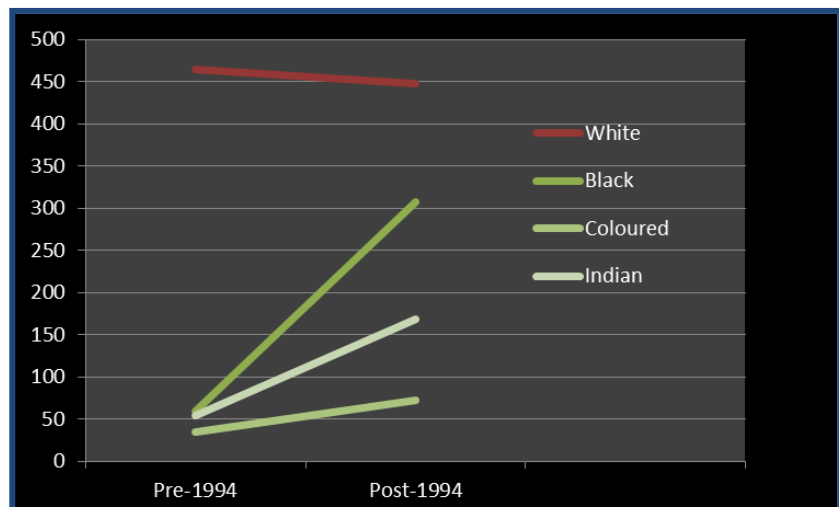
Figure 4.53. Line chart illustrating racial distribution pre- and post-political dispensation

The figures above further demonstrate what was mentioned previously with regard to racial distribution pre- and post- political dispensation. There was a slight decline in White CFC attendees' post 1994, a dramatic increase in Black CFC attendees, a large increase in Indian attendees, and a slight increase in Coloured attendees. These figures make sense as South Africa moved towards a free and equitable country for all race groups in 1994, with the establishment of South Africa's first Democratic government.

4.9. Client's School
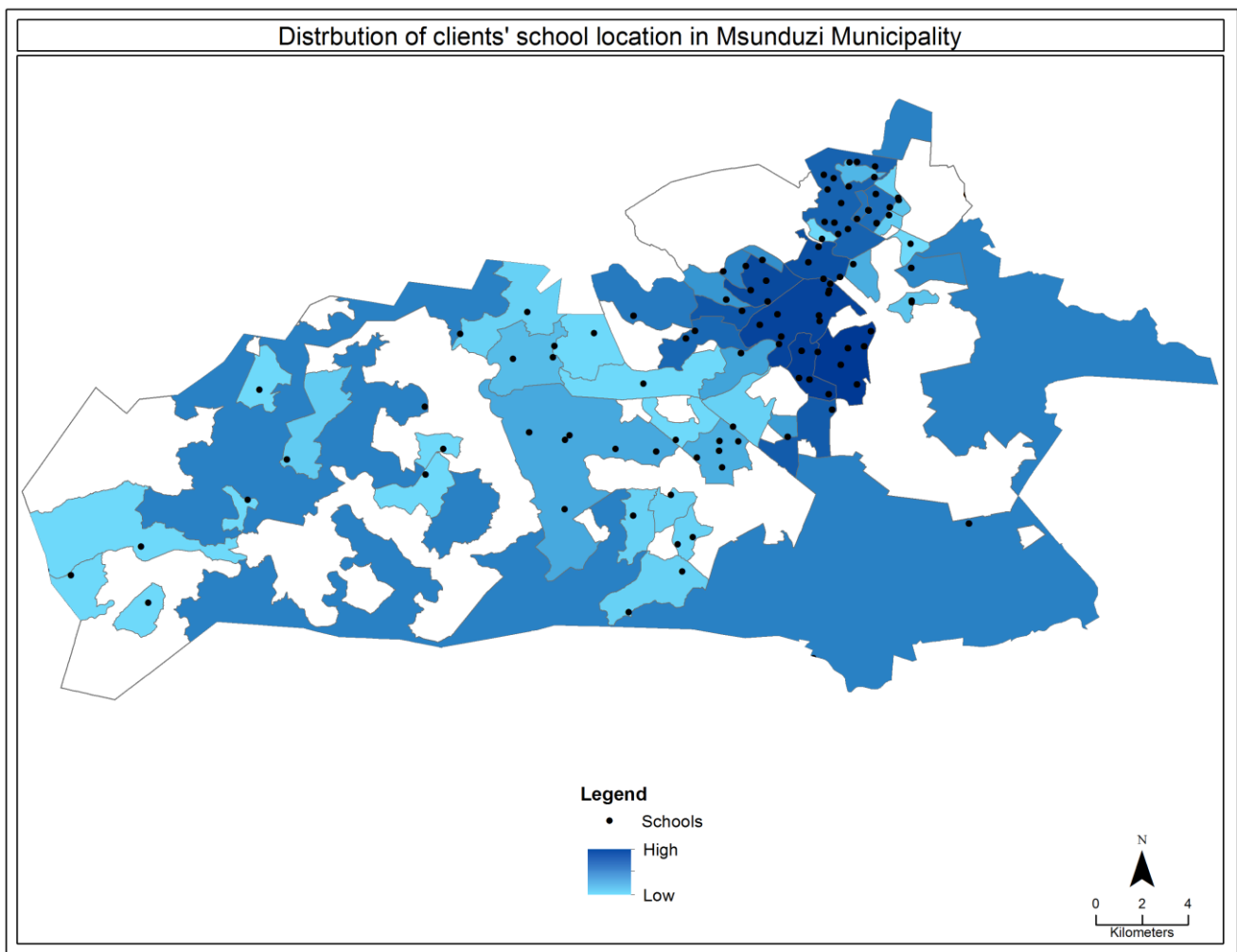
Figure 4.54. Map of clients' school distribution throughout the Msunduzi region

The map of CFC client schools reveals that schools are tightly clustered around the CBD, extending into the areas just to the West thereof. As noted by the Msunduzi Municipality (2009), schools are largely concentrated in the central areas of the PMB CBD, explaining the high concentration of schools in the central area. As per the frequency legend, the highest frequency of CFC users came from areas closest to the CFC. The highest number of referrals came from schools (Scottsville, Ridge and Clarendon) closest to the CFC. Two of these schools are within a 5km radius of the CFC, and have pre-existing relations with the CFC. Perhaps interventions need to start focussing on the more rural, distant areas to extend CFC reach.

White CFC attendees received the highest referrals from their schools, as did Black and Indian CFC attendees. This resonates with the above findings indicating that the client schools were distributed mainly in the Central, North and only slightly Western areas of the PMB Msunduzi region.

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4.9.10. Temporal changes in schools attended
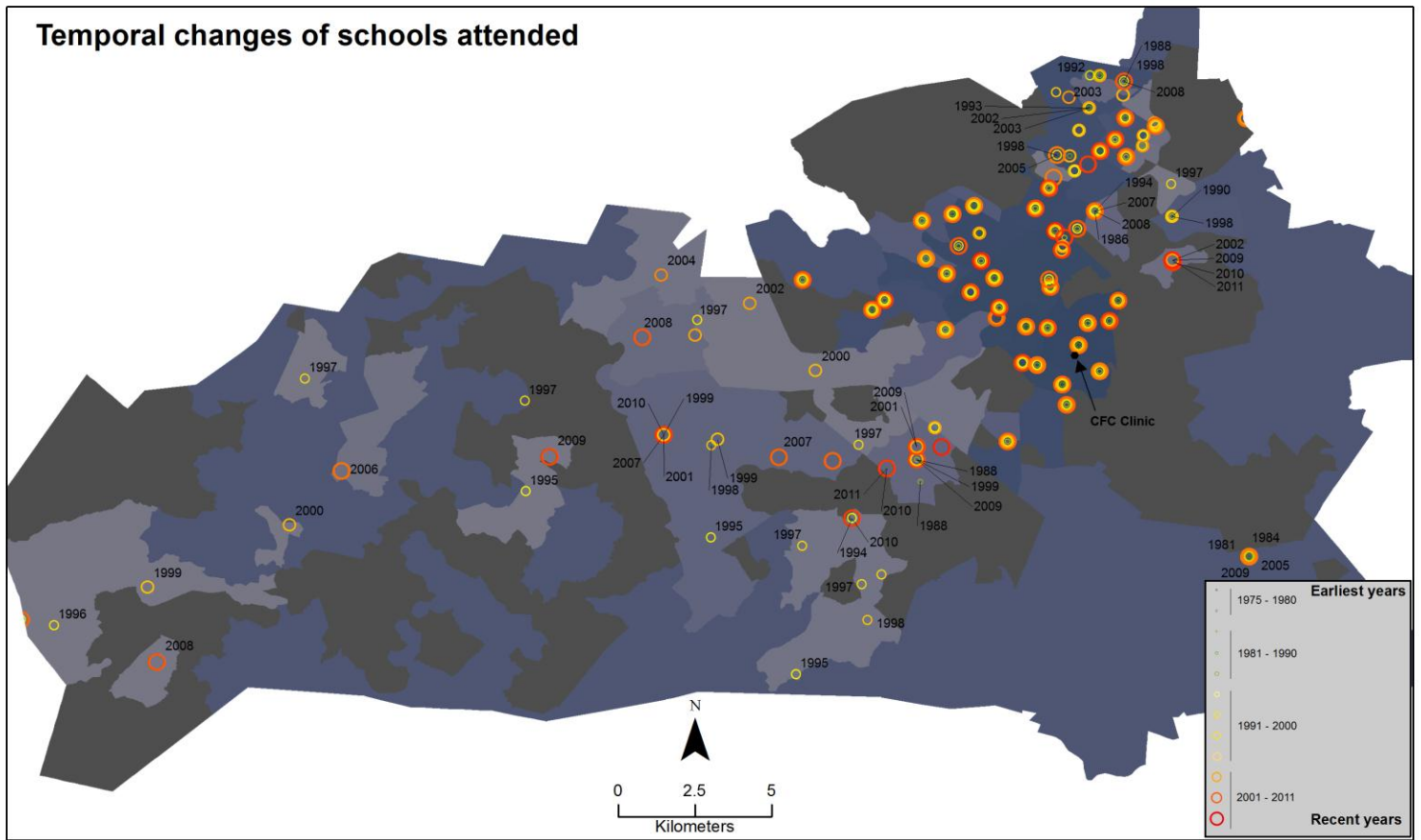
Figure 4.55. Map of temporal changes in clients' school attended

This map is an extension of the previous map. It illustrates the change in referrals received from schools attended by CFC clients over time. It indicates that the majority of schools in the Central areas (traditionally White Schools) dated back to the 1970's, and the schools extending to the west (Black Schools) only in latter years (1997 upwards). The Northern Schools (predominantly Indian) only start appearing roughly around 1998-2000's.

Top three attended schools

The sequence chart of schools shows that there was an increase in the number of CFC clients coming from Clarendon as of 1994. There was a slight peak in 1989, but only in 1994 did CFC attendees from Clarendon attend. Referrals from Scottsville started as early as 1984, reaching peak in 2008, and tapering off again closer to 2010. Ridge primary, as with the other schools, showed a significant temporal climb starting around 1994. A few CFC clients attended prior to this date.

Figure 4.56. Sequence chart of top three attended schools

Overall we can see an increase in the number of attendees from these schools as the CFC became more established. These schools all

surrounded the CFC closely. If you look at the Appendix D you will note that Clarendon Primary has the highest forecast for 2016.

4.9.10.1. Clarendon
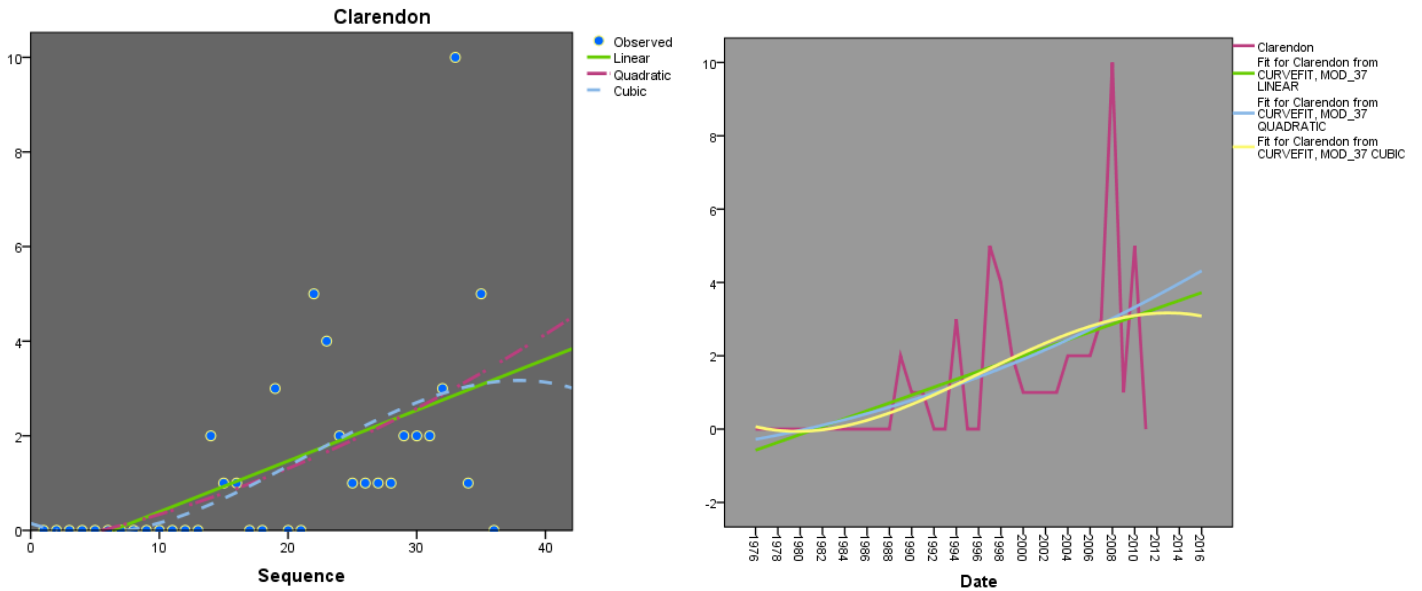
Figure 4.57. Chart of Regression models for Clarendon

The linear function for Clarendon was significant ($R^2 = 0.300$, $F(1, 34) = 14.560$, $p = 0.001$). The equation is $y = -0.683x + 0.107$. The linear function shows a predicted incline projected for 2016.

4.9.10.2.   Ridge Primary
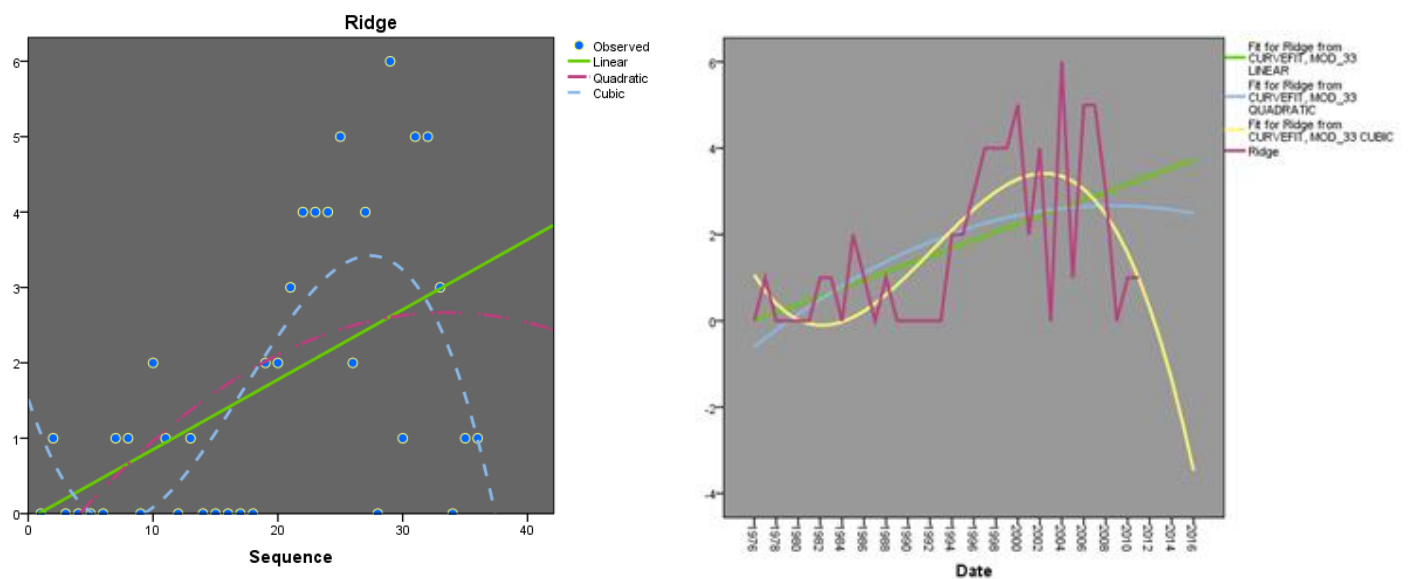
Figure 4.58. Chart of Regression models for Ridge Primary

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The cubic function for Ridge Primary is significant. (R^2 = 0.470, $F_{(3, 32)}$ = 9.474, $p < 0.0001$). The equation is $y = 1.520 - 0.499x + 0.044x^2 - 0.001x^3$, and shows a predicted decline predicted for 2016.

4.9.10.3. Scottsville Primary
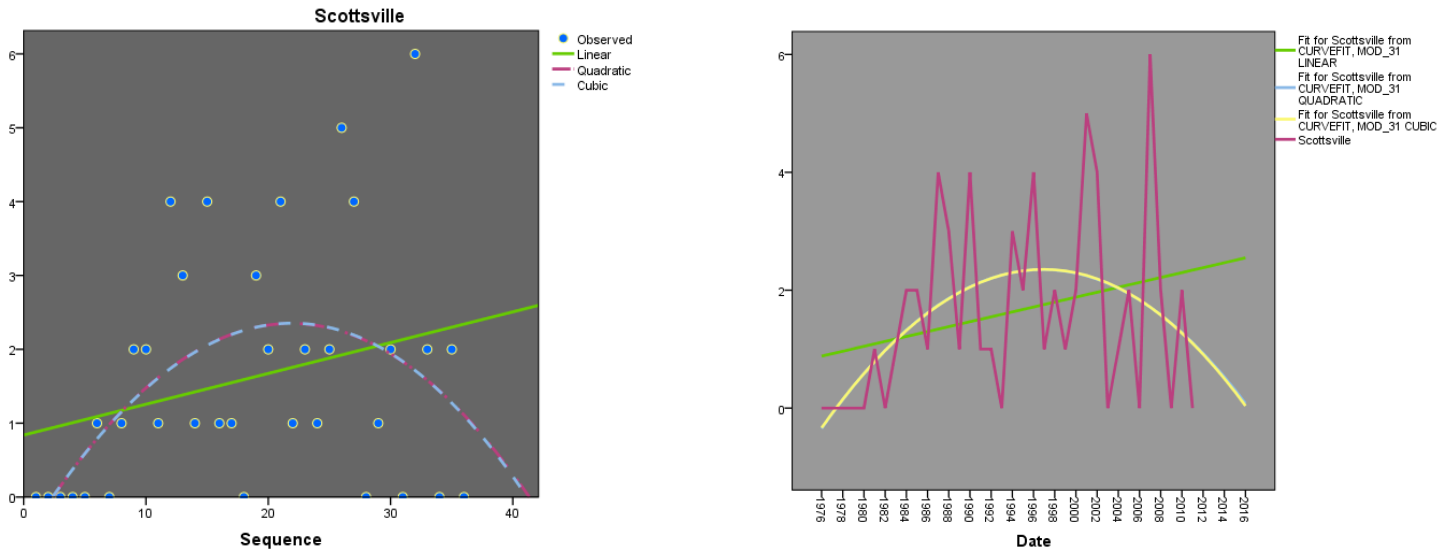
Figure 4.59. Chart of Regression models for Scottsville Primary

The quadratic function for Scottsville was significant (R^2 = 0.216, $F_{(2, 33)}$ = 4.556, $p = 0.018$), and concave. The equation is $y = -0.612 + 0.271x - 0.006x^2$. This function shows a predicted decline for 2016. It is difficult to interpret the results of the top three schools as two of the three schools not only fall within a 5km radius of the CFC, but Ridge Primary was a site for practice assessments. In more recent years, Scottsville no longer have CFC interns as they have formalised school counsellors permanently placed at the school. This could account for the overall decrease in referrals coming from Ridge and Scottsville Primary. The recent changes in the placement of CFC interns at schools like Scottsville and Ridge confound results.

4.10. Socio-economic status
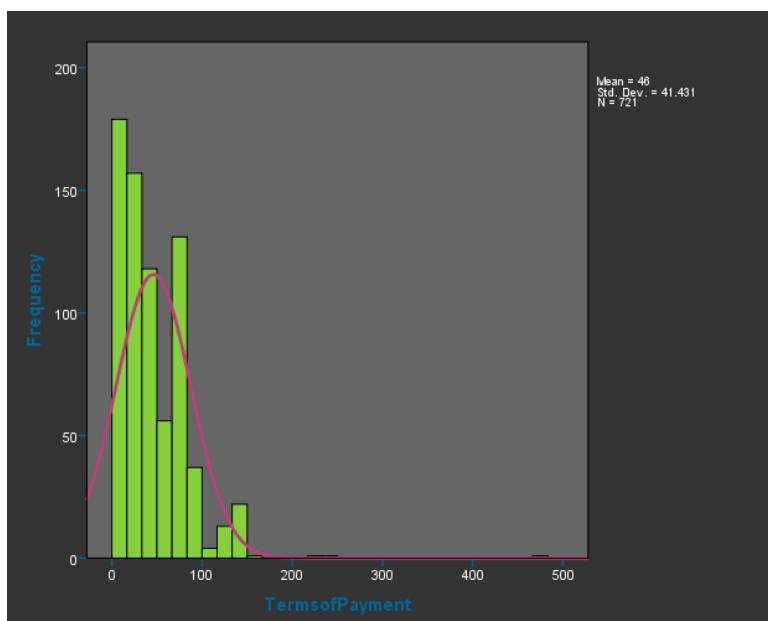
Figure 4.60. Bar chart indicating the mean payment made for CFC consultations

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The average amount paid per consultation was R46, with a standard deviation of R41.43 (n = 721). In 2008, the average consultation fee for a 45-60min consultation with a Psychologist was roughly R501,90 (for Medical Aids), and R450-R600 cash. This indicates a huge discrepancy between the amount paid by CFC goers, and the general population.
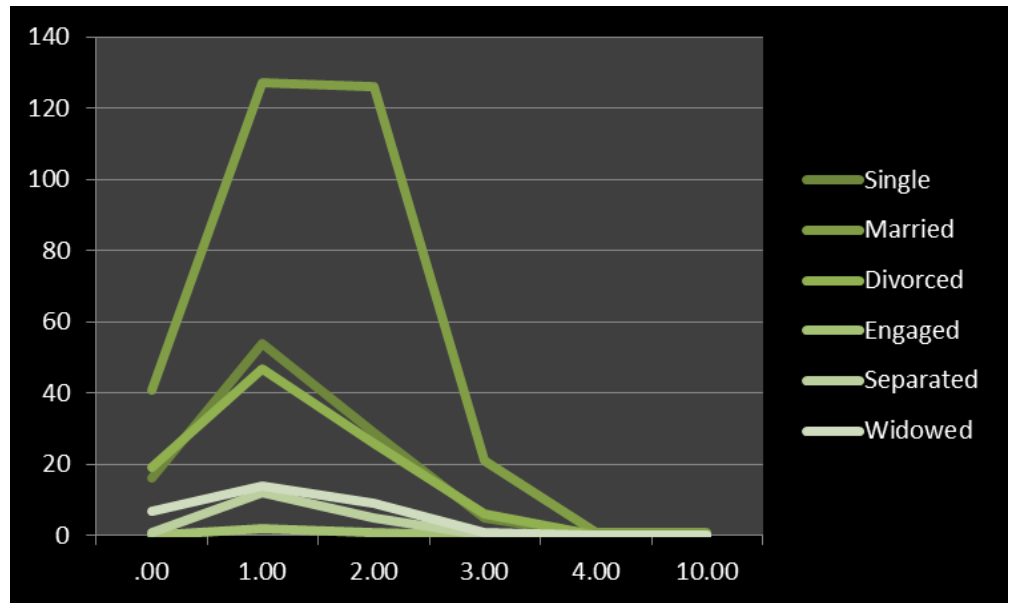
Figure 4.61. Line chart indicating the aggregated SES and marital status of caregivers

This means their aim of providing psychological services at a reduced cost has been effective.

The question, however, of whether or not the population most in need of psychological services have received it, is negotiable. A cross-tabulation of caregiver marital status and SES ranking was done, and revealed that those clients of single parents of very low to low SES status, have the highest prevalence of psychological difficulties. This was double the number of children of married parents of very low SES status. This implicates socio-economic and marital status of parents in children with psychological difficulties. Frans, Kunz & Schmnitz (2000) found that not only does low SES but also single-parent families are linked to increased psychological distress amongst children. As noted previously, however, it this finding may be a confound of pooled salaries, and therefore preference for private psychological services in two-headed households.

A Crosstabulation of race and the amount paid per consultation was done.
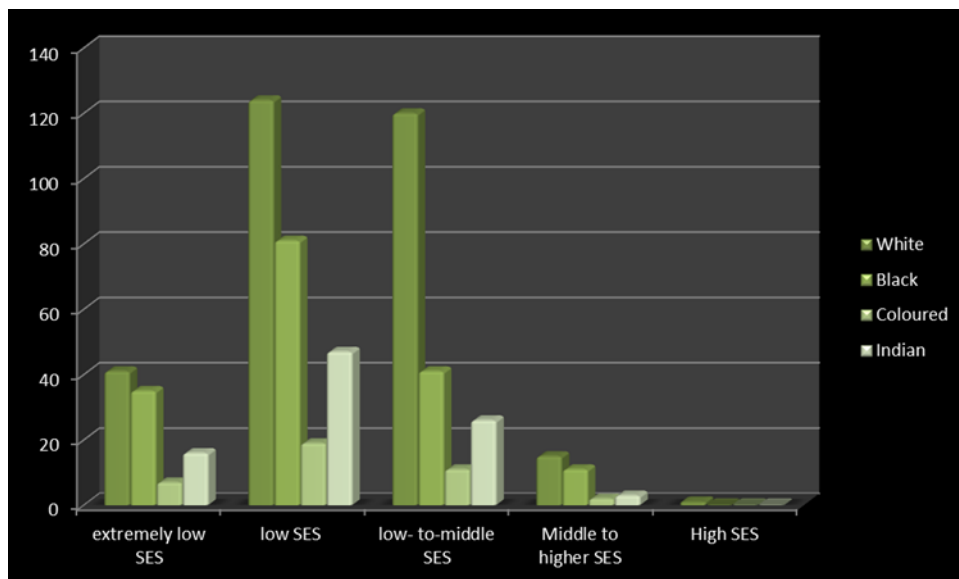
Figure 4.62. Bar Chart of client SES as estimated from amount paid for sessions

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In general it seems that White clients paid more for psychological services rendered by the CFC, followed by Black, Indian and Coloured clients respectively. Here it should be noted that "lower" and "higher" SES still constitutes "lower" in terms of cost of psychological services in the broad population. This means that even though the labels "middle" and "higher" are used, within the context of this discussion, these categories still fall within the lower population SES bracket. Given this understanding, the cross-tabulation between race and SES reveals that Black and White CFC attendees fall largely within the low SES and low-to-middle SES. Coloured largely within the Low SES bracket. Indian CFC attendees within the low and low-middle SES bracket. This is interesting to note, as White people in the 1970's and 1980's were said to be of more affluent, whereas Black, Indian and Coloured people marginalised, and received lower per capita income. If we were to look at the time trend of CFC attendee SES, it presents as follows:
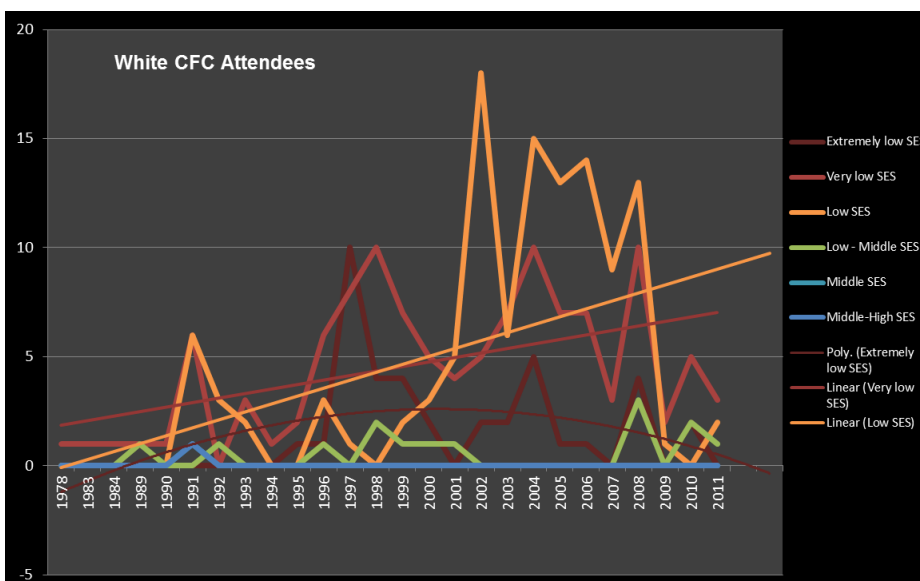
This sequence chart shows that there has been a very steady incline in the number of White CFC clients with low SES. The incline started around 1998, peaked between 2002 and 2009. There has also been a steady incline in those White CFC attendees with very low SES from roughly around 1995.

Figure 4.62. Sequence chart with best fitting lines for SES for White CFC attendees
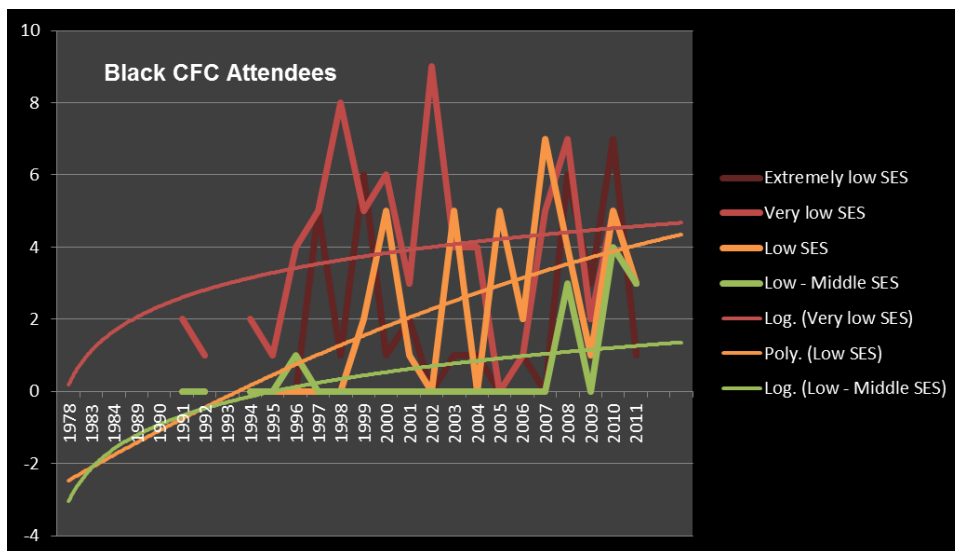
Black CFC attendees SES for classes extremely low, very low and low SES seems to be rather steady over time. The low-middle class seem to increase from roughly around 2007.

Figure 4.63. Sequence chart with best fitting lines for SES for Black CFC attendees

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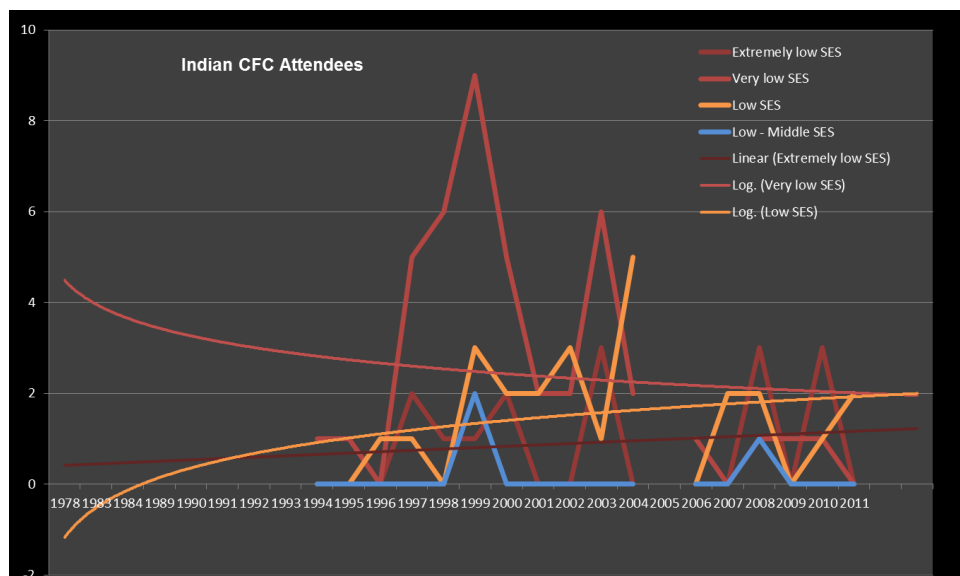
There is a decrease in the very low SES bracket for Indian CFC attendees from about 2004. The Indian clients falling in the low SES bracket seems relatively stable over time, however, there seems to be a slight increase in extremely low SES from around 2003.

Figure 4.64. Sequence chart with best fitting lines for SES for Indian CFC attendees

According to Dyer (2012), in 1976, Whites received 66% of the national income while only constituting 22% of the population, while Blacks received 25%, and constituted 65% of the population. The average disposable per capita income for Black people in 1983 was R1366, compared to R1360 for Coloured people, R2289 for Indian people, and R6242 for White people. Whiteford and Van Seventer (2000, in Van der Berg & Louw, 2003) noted that between 1991 – 1996, 40% of the poorest Blacks household income decreased by 20%. White employment during this period declined dramatically, whilst the number of Black people employed in skilled positions increased (ibid). This was coupled with an increase per capita for Black people. The decrease in household income for the poorest Black people was countered by a similar increase in income for the richest Black people. This meant that the up to two thirds of variance within household income is accounted for by intra-racial variance. Per capita income for Blacks in 1995 was estimated to be R6704, Coloureds R12 722, Indians R20 592, and Whites R53 840. In 2000, these figures were R7283, R14 126, R23 938, and R62 360 respectively. The growth of per capita income from 1970 – 2000 was 2.9% for Blacks, 1.8% for Coloureds, 3.1% for Indians, and 1.6% for Whites. Most of this growth occurred between 1970-1980 (Van der Berg & Louw, 2003) after the act for racial differences in income was banished in 1979 (Dyer, 2012). In a similar vein, poverty (below R3000 per capita per annum) has decreased for Black people from 64.6% in 1970, to 49.3% in 1980, 45.9% in 1990, and 47.4% in 2000 (ibid). This means that a large proportion of Black people in South Africa are classified as poor. Indians showed a decrease in poverty from 17.9% in 1970, to 12.5% in 1980, 8.7% in 1990, and 4.7% in 2000. White South Africans have had a previous advantage, in 1970 2.7% of the population was considered poor, and this dropped to 1.4% in 2000. Similarly, 34.1% of Coloureds were classified as poor in 1970, a figure that decreased to 19% in 2000 (ibid). These poverty rates are noteworthy, and have shown very little improvement over time. Jalovaara (2002) noted an inverse relationship between SES and propensity for divorce and separation. Msunduzi Municipality (2009) mentioned that more than 70% of households in the Edendale area earn less than R1600 per month.

4.11. Presenting problems

Client referral slips were used to determine reasons for referral. It is important note that primary findings do not constitute prevalence data, but rather reflect presenting problem trends in association with the reach/access trends of the CFC. As such, primary data says nothing in particular about problems in particular sub-areas, as it is confounded by reach.
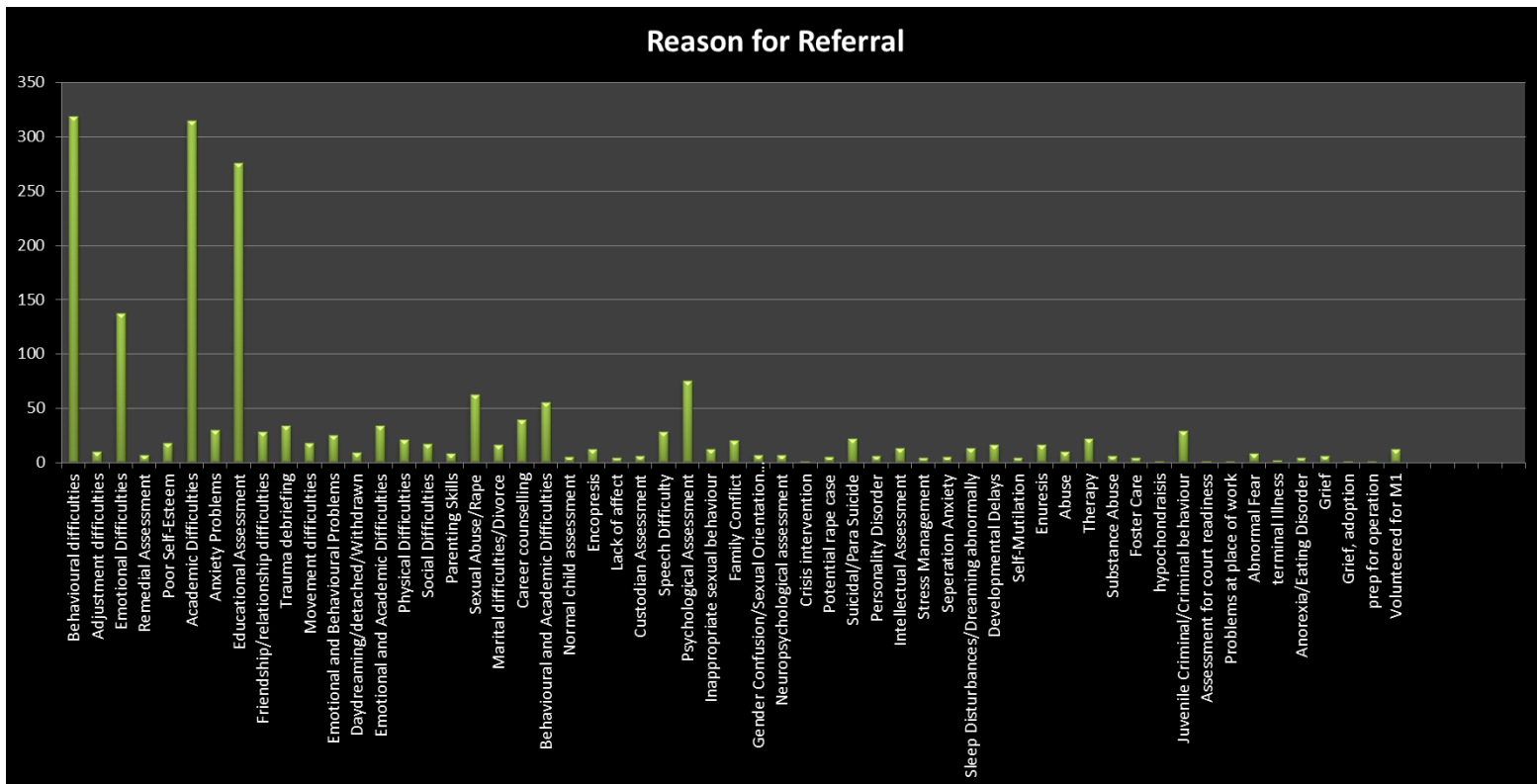
Figure 4.65. Bar chart indicating the reasons for referral

Overall, Behavioural (20%); Academic (37.5%); and Emotional difficulties (7.5%) constituted the top three reasons for referral (n = 1867). 5.5% for Psychological Assessment; 3.3% for sexual abuse/rape; 2.9% for both behavioural and academic difficulties; and 2.1% for career counselling (n = 1867). Different age groups have different psychological needs, and requirements. Illnesses mostly effecting children include (Cortina *et al.*, 2012) 20-60% of adults in sub-Saharan Africa are said to suffer from PTSD, anxiety and depression. The study done by Cortina *et al.* (2012) revealed the most common childhood disorders to be emotional, anxiety, conduct, disruptive and reactive behaviour and PTSD. Authors have suggested further disorders included ADHD (Alabama Psychiatric Services, 1999; Loewen, 2013) learning disabilities, Schizophrenia, and developmental disorders (Loewen 2013; WHO, 2003; Fayyad, 2001). Similar findings were made in this study. In December 2012, Childline KZN reported that of the 471 reported cases, 40 were children exposed to domestic violence; 34 were rape cases; 58 of the children were starving, 40 did not possess adequate clothing; other cases included depression; behavioural difficulties; loneliness; self-confidence problems; communication difficulties; self-mutilation; sleep difficulties and suicide.
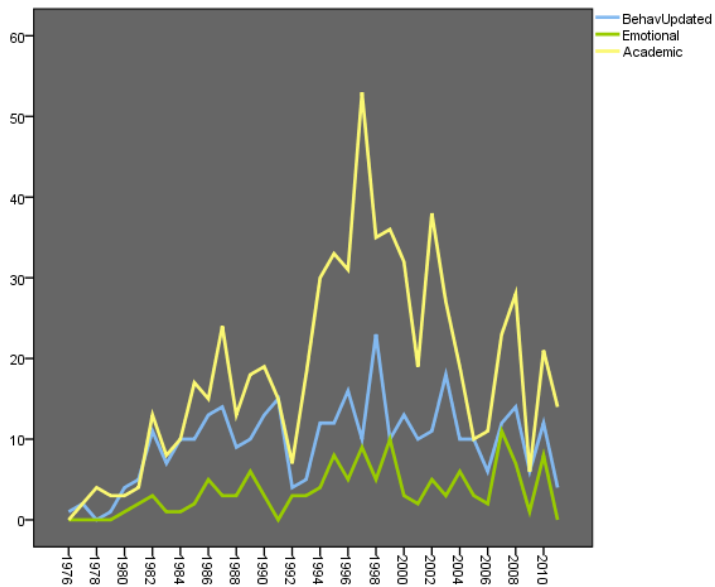
Figure 4.66. Sequence chart indicating the top three reasons for referral

The map for the total reasons for referral per sub-place indicates that academic difficulties constitute the largest proportion of difficulties across all stacked bar charts. This map highlights the differences in reasons for referral across various sub-areas in the Msunduzi district. The sequence chart of the top three presenting problems does not show any definitive trend, however, does demonstrate a variation around its mean level. There is a peak between 1996 – 1998. As we wished to make forecasts for more than one period ahead, the exponential smoothing

technique will not be appropriate.

From the map below, it is evident that academic difficulties are the most prevalent across most sub-areas. The North Western areas (Chase Valley, Belfort, Ferncliffe) show mainly referrals for emotional difficulties. The Scottsville sub-place showed the highest variation of presenting problems. Psychological assessment seems limited mainly to Scottsville and Clarendon. It was schools in these areas where CFC interns worked.
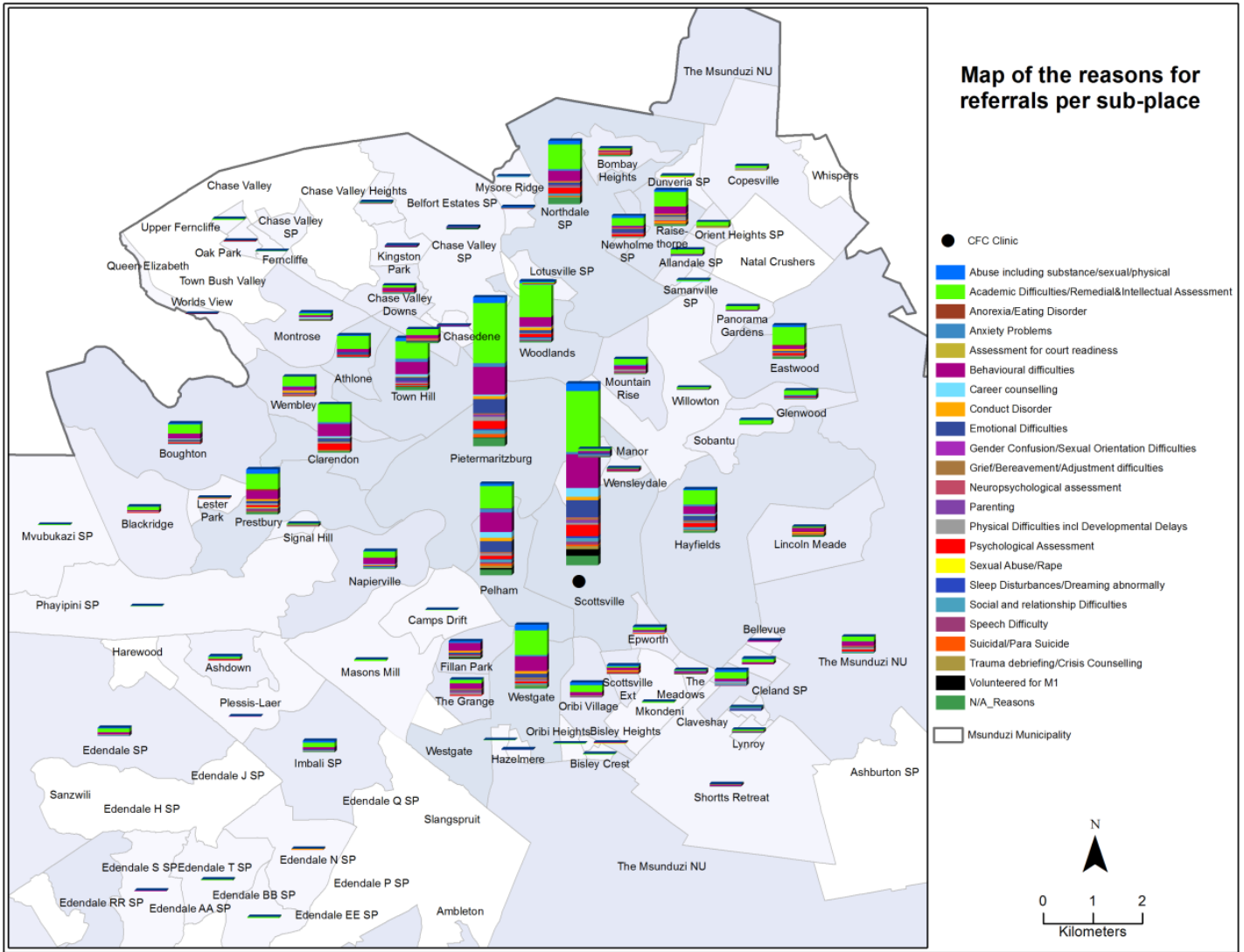
Figure 4.67. Map of selected stack charts indicating referral problems per sub-place overlaid over the map of the Msunduzi Municipal Region

The North East areas (Raisethorpe, Dunveria, Copesville) showed the highest percentage of sexual abuse/rape. Physical difficulties seem disproportionately distributed to the central and northern areas (PMB CBD, Mountain Rise, Raisethorpe, Copesville). Career Counselling seems restricted to Central and North-eastern surrounds (Scottsville, Pelham, Town Hill, Montrose). These areas were traditionally populated by White people. This is an interesting finding as only those people who have all their basic needs met can strive for career advancement and focus. Suicide and para-suicide seem mainly affiliated with Raisethorpe. The M1 Volunteers are restricted to Scottsville and Pelham, which resonates with M1 placements in schools.

Figure 4.68. Map of selected stack charts indicating referral problems per sub-place overlaid over a map indicating built-up areas throughout the Msunduzi Municipal Region

PMB, with very little reach in the South Western areas (Edendale, Plessilaer, Imbali, Camps Drift, Ashdown). Perhaps if these previously disadvantaged areas were to be targeted, the referral problem composition would be considerably different.

The top 10 reasons for referral were plotted on a map where purple demonstrates built-up areas and tar roads, and green, non-built-up areas. The Edendale, Imbali, Plessislaer areas, despite showing a population similar to that of built up areas (based on the colour purple indicating such) there is a drastic difference in referrals, and referral problems.

Table 4.8.

Time series models chosen to forecast top four reasons for referral

			Model Type
Model ID	Behavioural	Model_1	Simple
	Emotional	Model_2	Simple
	Academic	Model_3	Simple
	Social_relationship_Difficultie s	Model_4	Simple
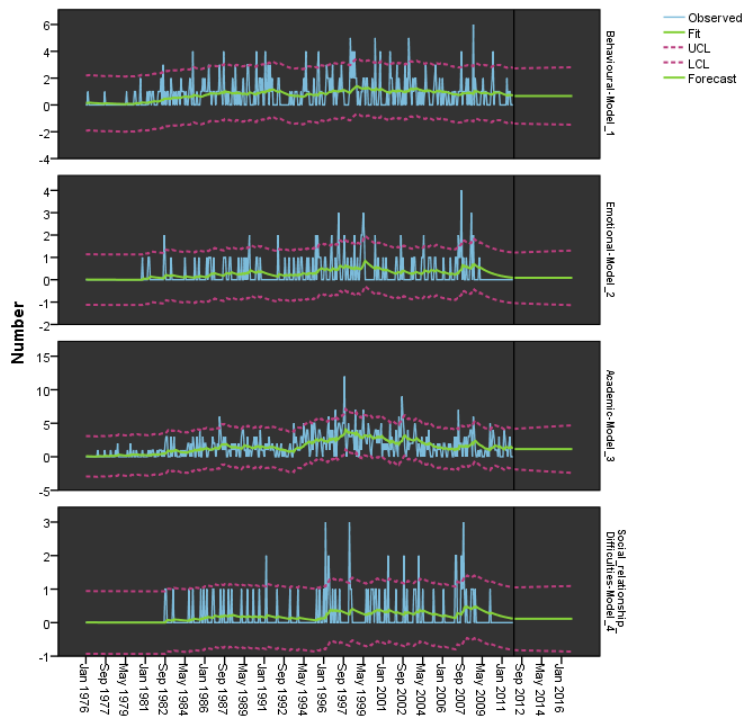
Figure 4.69. Time Series Forecast for top referral problems difficulties was the only model that showed a predicted increase projected for 2016.

The best fit models chosen for presenting problem were Simple models. MaxAPE revealed that the largest error for each model falls between 2-8%. Only the behavioural model is significant ($R^2 = 0.044$, Q' (17) = 31.904, $p = 0.015$); ($R^2 = 0.041$, Q' (17) = 22.884, $p = 0.153$); ($R^2 = 0.209$, Q' (17) = 23.007, $p = 0.149$); ($R^2 = 0.023$, Q' (17) = 22.585, $p = 0.163$). Behavioural difficulties, as per the line of best fit, show a constant reporting over time. There seems to be a slight increase in September 2007. The predictive model shows steady reporting of behavioural difficulties over time until 2016. The model for Academic

4.12. Presenting problem over time: Academic difficulties
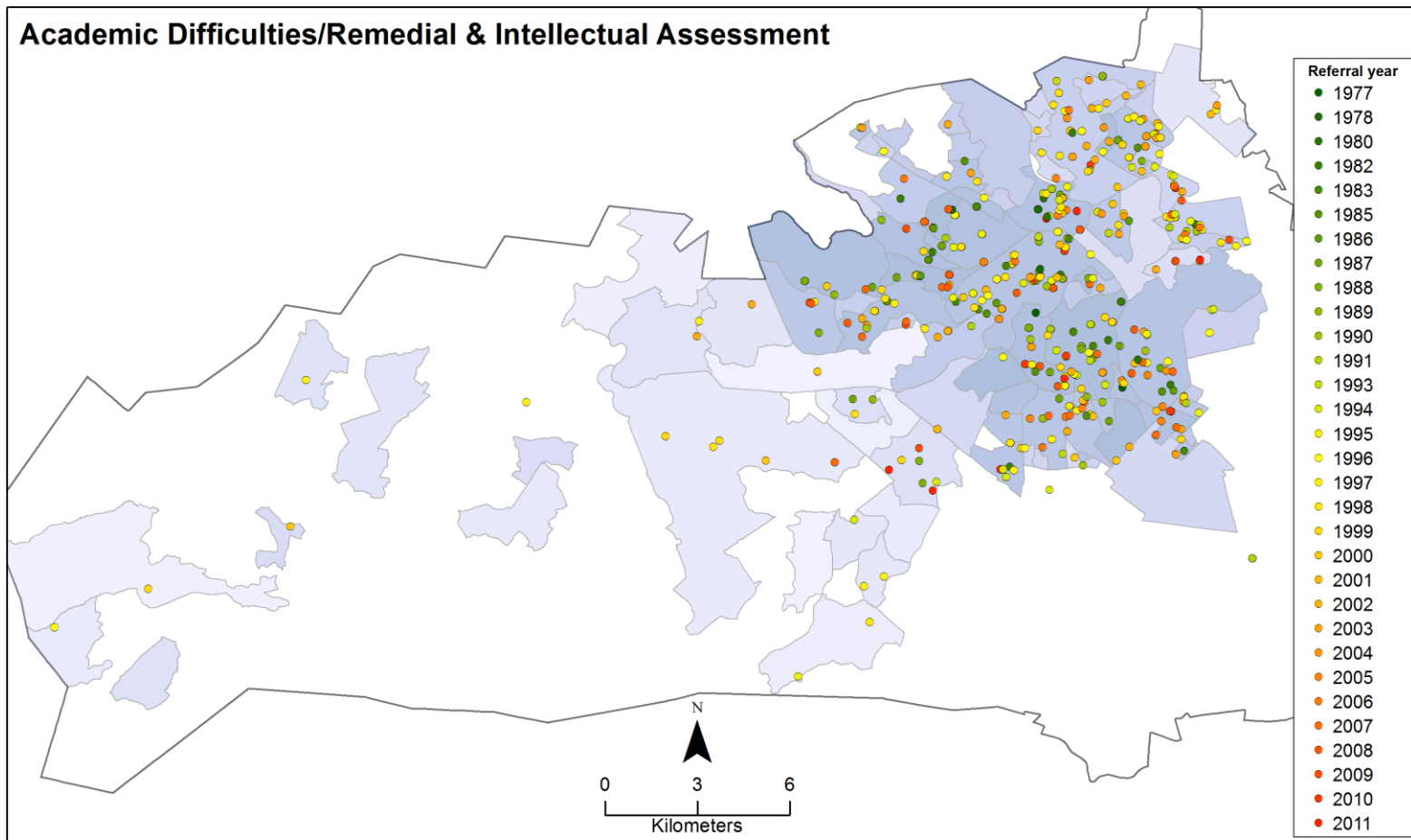
Figure 4.70. Map of academic difficulties, remedial and intellectual assessment per sub-place throughout the Msunduzi region

It is evident from the above map that academic difficulties are more centrally located in former years (1977 – 1988). From roughly 2000, clients further away start attending the CFC. Once again, around 2000 onwards, CFC attendees attended the CFC from further away. The issue of access once again comes into light. The frequency of consultations of attendees from further away is significantly lower than those attending closer to the CFC. This is particularly concerning as the earlier the identification, diagnosis and treatment of the learning disorder, the better and more effective treatment (National Institute of Health, 2012). There was a significant difference in academic difficulties over time (in years) ($F(1, 33) = 62.769$, $p < 0.0001$). There was a significant difference in behavioural difficulties between: 1976 and 1994, 1995, 1996, 1997, 1998, 1999, 2000, and 2002; 1977 and 1995, 1996, 1997, 1998, 1999, 2000, and 2002; 1978 and 1995, 1997, 1998, 1999, and 2002; 1979 and 1995, 1997, 1998, 1999, 2000, and 2002; 1991 and 2007; 2007 and 1976, 1977, 1978, 1979, 2010 and 2011. Overall the trend shows a prominent difference between 1990's and 2000's. A Cross-tabulation of academic shows 193, compared to 466 referrals were made for Academic difficulties respectively. The line chart demonstrates a large difference in numbers before and after political dispensation in 1994.
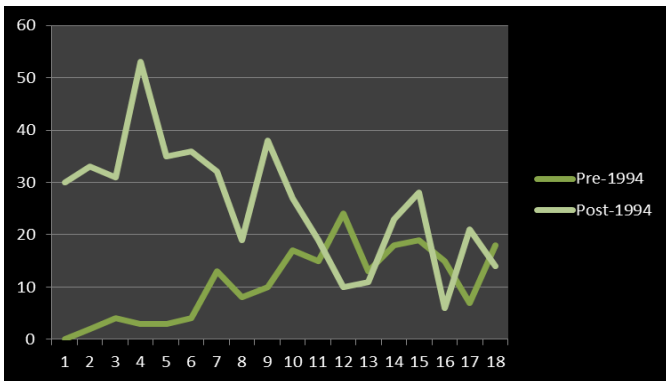
Figure 4.71. Sequence chart of academic difficulties pre- and post- 1994
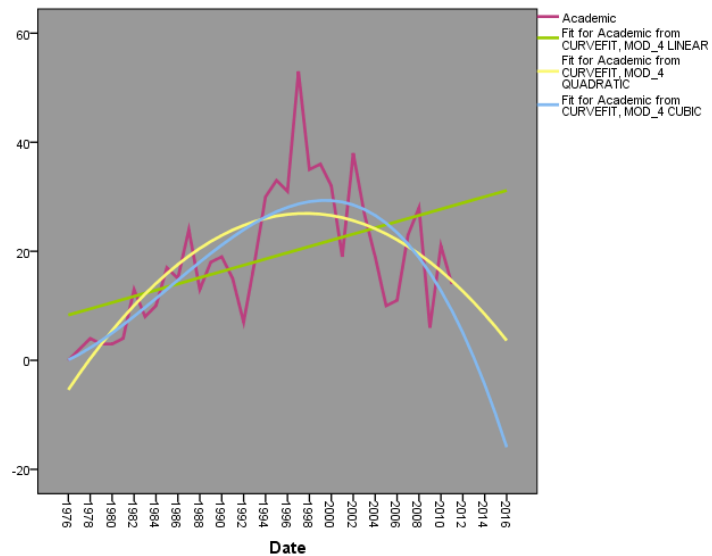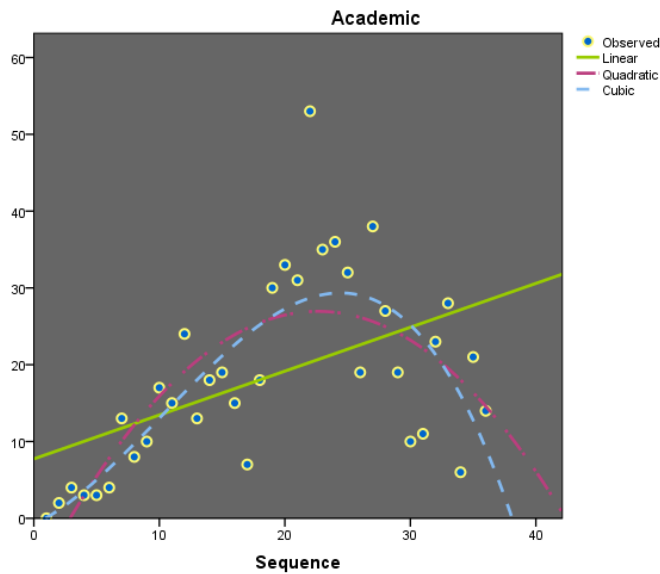
Figure 4.72. Chart of Regression models for Academic Difficulties

The quadratic function for academic difficulties is significant ($R^2 = 0.544$, $F(2, 33) = 19.666$, $p < 0.0001$) and concave. The equation is $y = -8.460 + 3.129x – 0.069x^2$.

Learning disabilities are characterised by difficulties with collecting, categorising, and processing and performing verbal and non-verbal information (Bright Tots, 2013). It is also a neurological disorder

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affecting the ability to receive, process, analyse and store information (NIH, 2012). Learning disabilities take on several forms, including (Cutter, Jaffe-Gill & Benedictis, 2011): Language; Calculation; Motor Skills and Communication. Learning difficulties often impact on children's ability to listen, speak, understand, decode, comprehend, read, compute and solve problems (mathematics) (ibid). These are vital skills to survive and be successful in today's society.

Scholastic difficulties are often attributable to ADD and ADHD. Although classified as a behavioural and neurodevelopmental disorder, ADD and ADHD have severe consequences for learning. ADD/ADHD is prevalence is roughly between 5-7% in school-going children. If left untreated, as evidently is the case in areas further from the CFC, it may result in failure at school, injuries and accidents, substance abuse, difficulty with relationships with peers and parents, and poor self-esteem. Of the children suffering from ADD/ADHD, 40% continue to experience difficulties into adulthood (Boston Childrens Hospital, 2011). All of these complications are evident as presenting problems in the sample. Given that that only recently a few (very small minority) clients from rural areas are accessing CFC services due to issues of access, location if the CFC in relation to schools at which CFC interns were placed, there is a need to start accessing clients beyond the pre-existing immediate-proximity catchment area. The Office of Communications (2012) cited poor vision as one of the causes for poor learning. In fact, up to 40% of children with learning disabilities have visual difficulties. Given that 80% of what children learn is essentially visual within the first 12 years of life, and that as much as 20% of children have compromised vision, it is imperative for programs focussed on identifying these problems be launched.

4.13. Presenting problem over time: Behavioural Difficulties
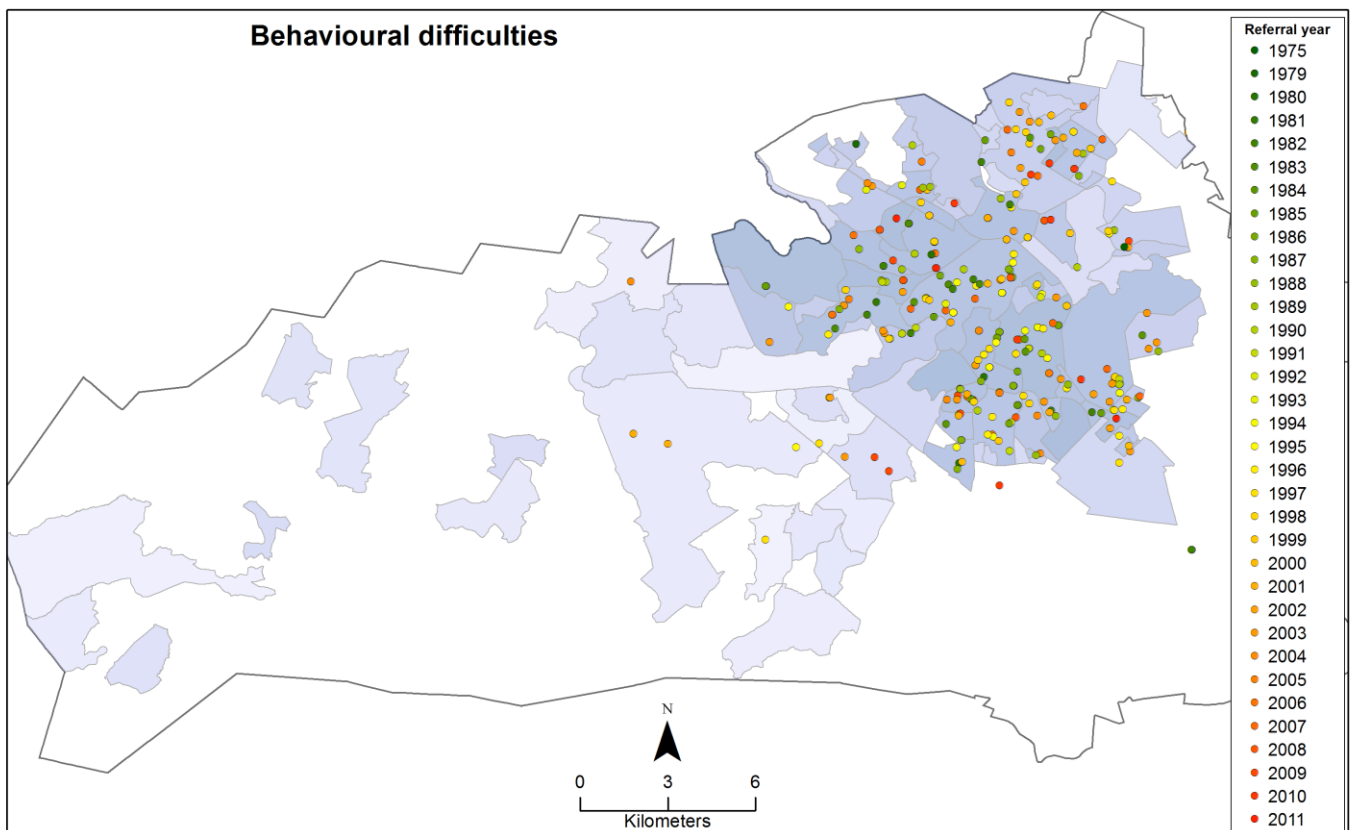
Figure 4.73. Map of behavioural difficulties per sub-place throughout the Msunduzi region

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Behavioural difficulties show a similar pattern to what we have previously noted. Most behavioural difficulties around the late 1970s, and 1980's occurred in areas in Scottsville (populated largely by White people). Only in the 2000's did referrals from further away appear.
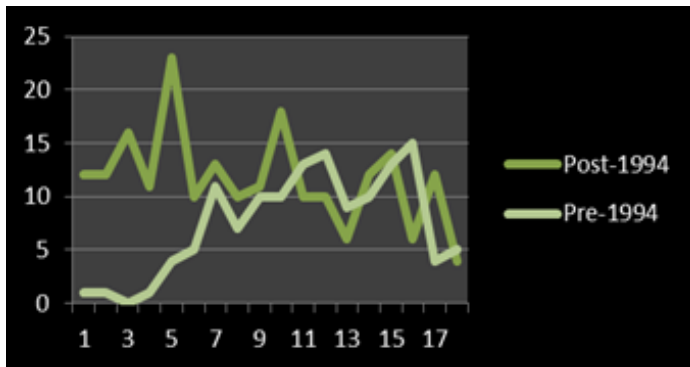
There is a significant difference in behavioural difficulties over time (in years) (F(1, 33) = 22.663, p < 0.0001). There was a significant difference in behavioural difficulties between 1998 and 1976, 1977, 1978, 1979. Looking at the line chart alongside, these differences between pre-1994 and post-1994 are evident. Overall, there are more referrals for behavioural difficulties made post-1994.

Figure 4.74. Sequence chart of behavioural difficulties pre- and post- 1994
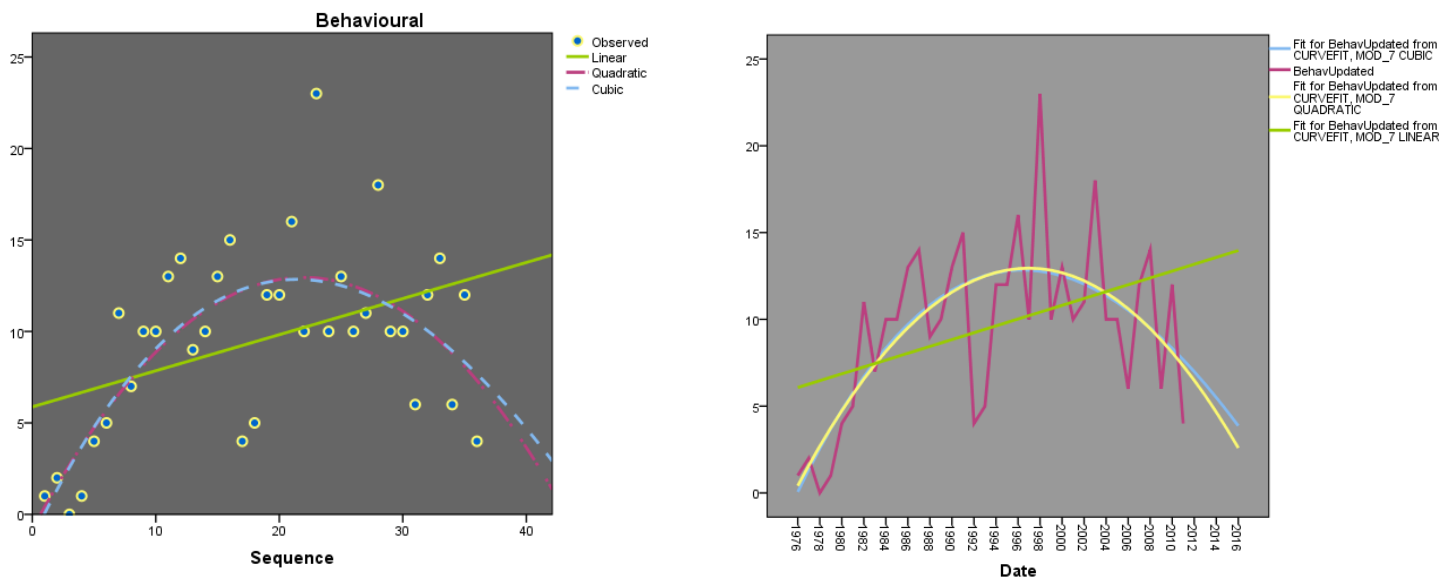
Figure 4.75. Chart of Regression models for behavioural difficulties

Behavioural difficulties are significant, and the quadratic function is more fitting (R² = 0.477, F(2, 33) = 15.045, p < 0.0001) and concave. The equation is y = -0.812 + 1.254x – 0.029x².

Behavioural difficulties are still present in the Msunduzi region as highlighted by the KZN Childline statistics previously presented. Included within these is criminality, and Pietermaritzburg was rated one of the top ten precincts for robberies, crime and other delinquent behaviour. In fact, high levels of crime is synonymous with rural areas (KZN Department of Safety and Liaison, 2010)

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4.14. Presenting problem over time: Emotional Difficulties
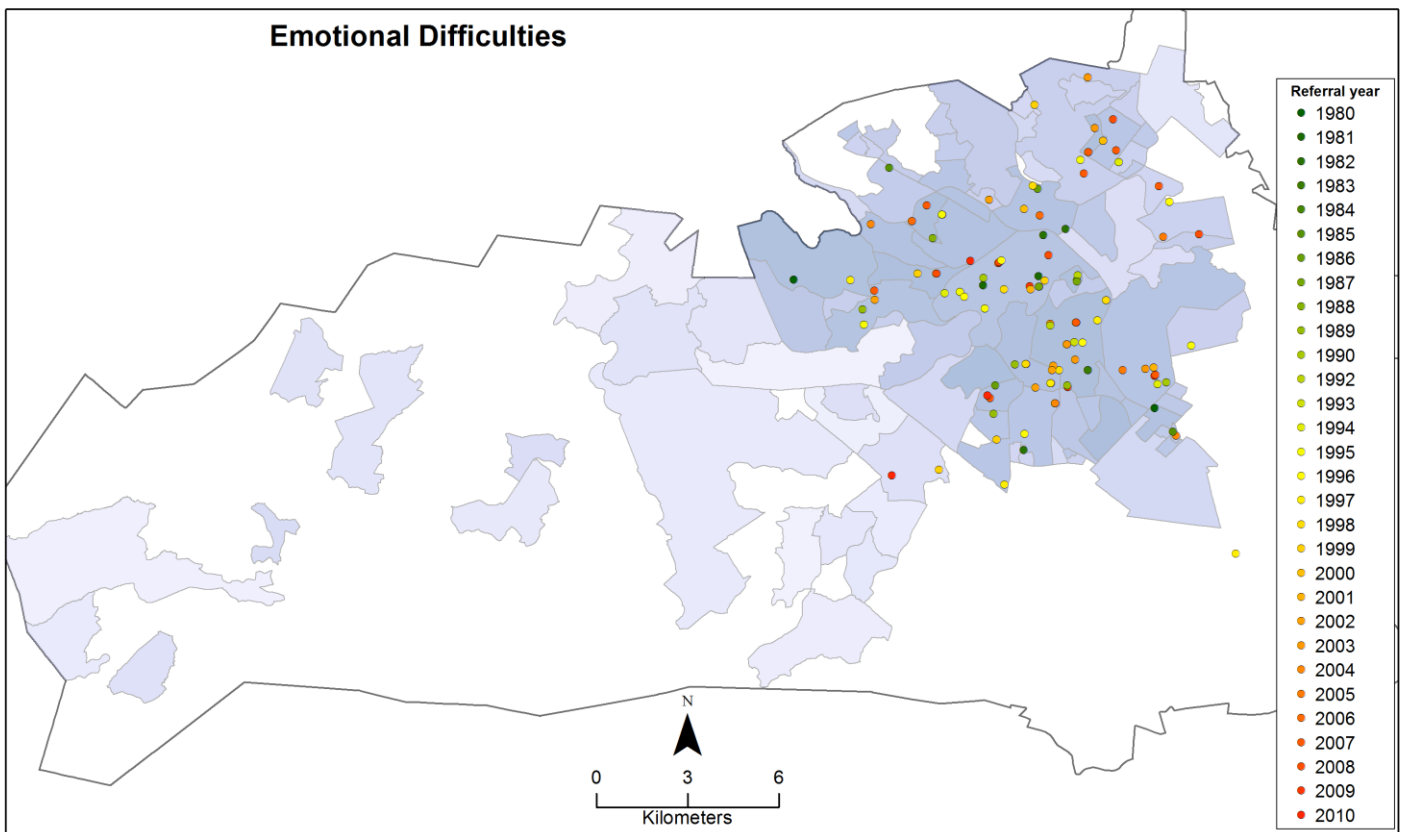
Figure 4.76. Map of emotional difficulties per sub-place throughout the Msunduzi region

In general, emotional difficulties seem to spread over time to areas further away from the CFC. The degree of spread is not as great as with other maps previously discussed. This is concerning as theories on the impact of emotional difficulties such as mood disorders, depression is significantly impacted upon by socio-economic status (Weich & Lewis, 1998). Not only was the prevalence higher, but, the duration of depressive episodes was longer. Those clients from more distant areas have lower SES indices than other, more urban and northern sub-areas in PMB.
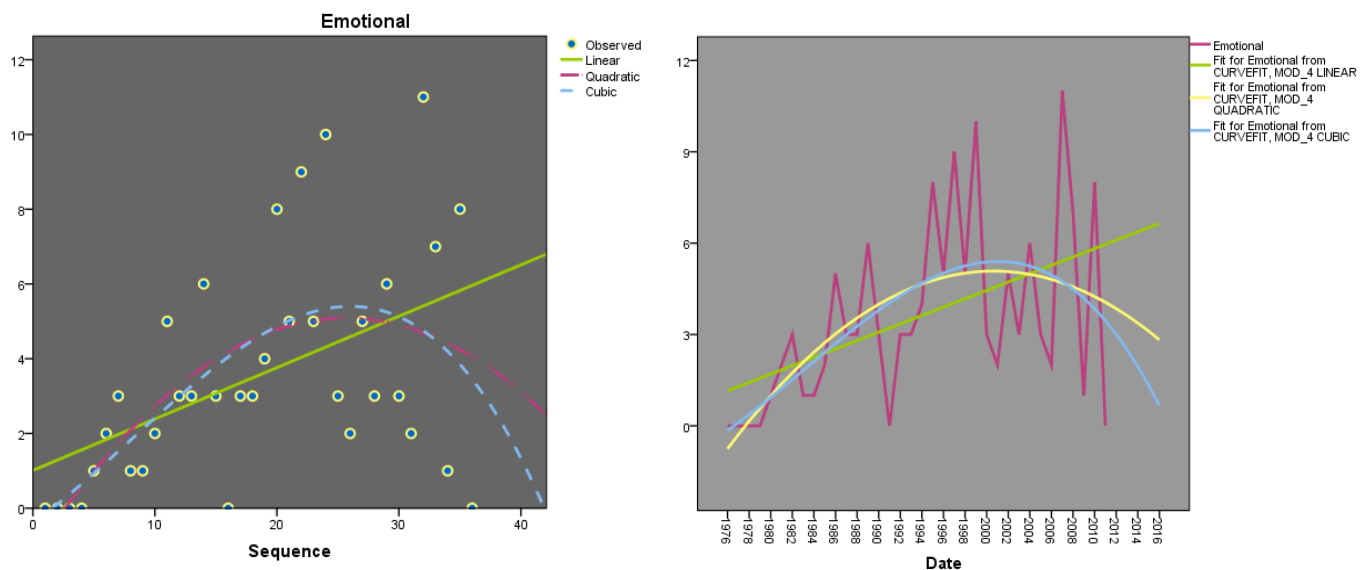
Figure 4.77. Chart of Regression models for emotional difficulties

The quadratic function for emotional problems was the best fitting, and accounted for the most variance ($R^2 = 0.333$, $F_{(2, 33)} = 8.241$, $p = 0.001$). The equation was as follows: $y = -1.236 + 0.493x – 0.010 x^2$. There was a significant difference in emotional difficulties over time (in years) ($F_{(1, 33)} = 16.379$, $p < 0.0001$). There was a significant difference in emotional difficulties between 2007 and 1976, 1977, 1978, 1979, 1991, 2010 and 2011. A Cross-tabulation of emotional difficulties and pre- and post-1994 was conducted, revealing number of referrals for emotional difficulties equalling 36 and 92 respectively. These differences could be accounted for by socio-political changes between former and latter years, change in SES, or even demographic changes over time.
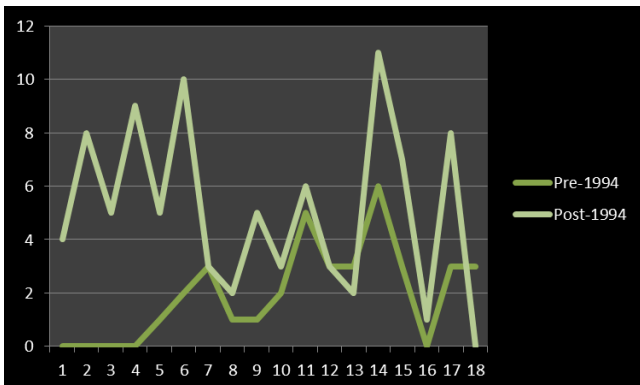
Figure 4.78. Sequence chart of emotional difficulties pre- and post- 1994

Other presenting problems included:

- Abuse (Substance, sexual, and physical);
- Grief, Bereavement and Adjustment Difficulties;
- Physical Difficulties;
- Social and Relationship Difficulties;
- Suicide/Para-suicide; and
- Trauma Debriefing and Crisis Counselling.

4.16. Presenting problem over time Sexual Abuse; Physical Abuse; and Substance Abuse
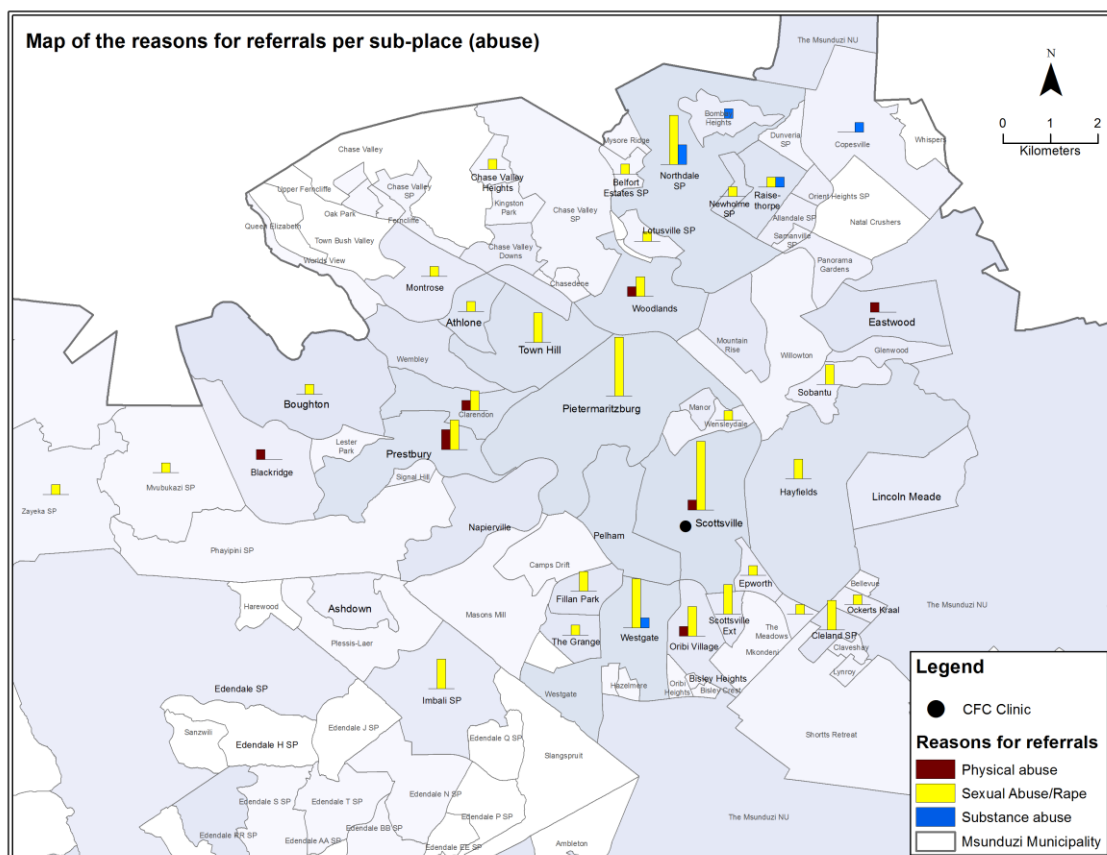
Figure 4.79. Map of sexual; substance and physical abuse per sub-place throughout the Msunduzi Region over time

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This map demonstrates the reported and referred sexual; physical and substance abuse by sub-area. Once again, there seems to be an outward movement over time. Most cases initially clustered around the CFC (roughly between 1986, 1988, 1993, 1996, 1999, 2000) and as years progressed, the trend demonstrated a mushrooming motion outwards (1996, 2002, 2005, 2008, 2010). The importance of tapping into rural areas is imperative. The effect of not receiving therapy after such trauma, especially at such a young age, has devastating consequences later on, both emotionally and psychologically.

4.16.   Presenting problem over time: Sexual abuse

Sexual abuse patterns as seen above indicate hotspots, especially in the central PMB areas. The KZN Department of Safety & Liaison (2010) stated that not only are schools in rural communities under-resourced, but the female scholars are targets of sexual assault. Statistics South Africa (2010) found that rape figures for KZN between 2001 - 2003 increased from 9196 to 9489. In fact, Plessislaer were one of the top rape sites between 2007-2008 (KZN Department of Safety and Liaison, 2010). These figures are alarming, and highlight the urgent need for psychological and other health services for the youth. UNICEF (2013) highlighted the inherited legacy of violence, inequality and social dislocation, which have translated into domestic violence, substance and sexual abuse, and neglect. Of the 50 000 cases reported to the SAPS, where children are victims of crime, 40% are for sexual abuse (ibid). The outward trend in the referred abuse cases over time is not surprising. The more outward areas are now starting to be incorporated into CFC reach, these areas are more rural, and characteristically more associated with abuse of all kinds, especially substance abuse.

4.17.   Presenting problem over time: Physical Abuse

Physical abuse seems to be more distributed around the Northern and Western PMB. These areas, as previously reviewed, are more impoverished areas. Childline (2013) reported that 40% of children in KZN have been physically abused.

4.18.   Presenting problem over time: Substance Abuse

There has been a correlation between poverty, social exclusion, and drug use (DARA, 2012). Risk factors for substance abuse include unemployment (especially those who have long-term unemployment); childhood trauma; genetic pre-disposition; and mental illness (ibid). These characteristics are particularly prevalent in areas like Edendale, Imbali, Vulindlela. As seen in the map above, substance abuse seems to be more prevalent in the Northern areas (Northdale, Copesville, Raisethorpe). As previously reviewed, these areas are significantly under-developed compared to their more central counterparts. Of lifetime disorders, anxiety disorders are the most prevalent affecting 15.8% of individuals, followed by substance abuse disorders at 13.3%. A prevalence of 5.8% indicates that South Africans rank about twice as high in substance abuse compared to other countries worldwide (Williams et al., 2008; Schneider et al., 2007). The substance most abused by

South Africans is alcohol, which contributes to interpersonal violence and is the cause of Fetal Alcohol Syndrome.

4.19. Presenting problem over time: Grief
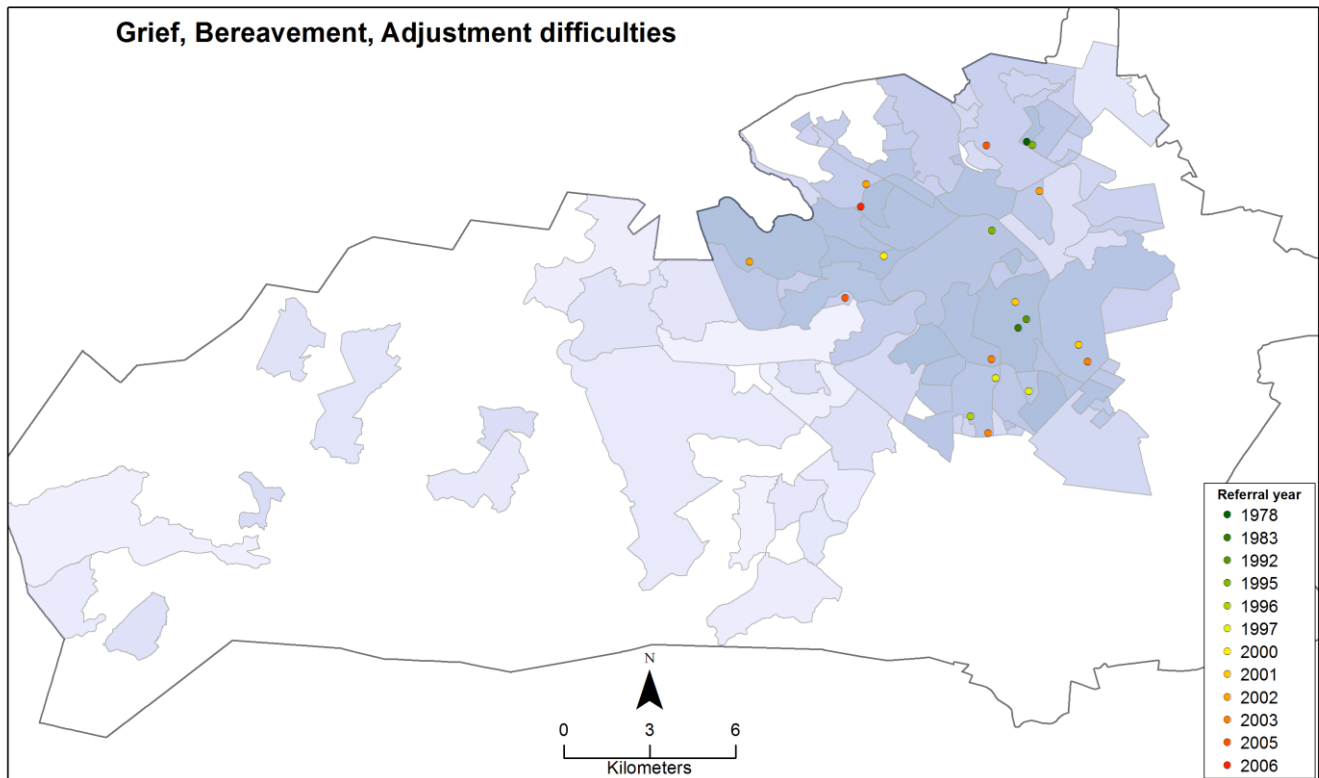
Figure 4.80. Map of grief, bereavement and adjustment difficulties per sub-place throughout the Msunduzi region

Grief did not seem to be a major difficulty in the 1970's. White CFC attendees dominated CFC clientele around this time, and were largely sheltered from the atrocities occurring in surrounding areas at the time. The seven day war, amongst other atrocities, and the increase in violent crimes and deaths (Dyer, 2012) resulted in significant trauma, and grief. Coupled with the devastating effects of apartheid and its racial segregation, which tore Black families apart, grief was very prevalent in surrounding areas. It is evident from the map that as more Black, Coloured, and Indian attendees attended the CFC, so too did the CFC geographical reach increase, and there was an increase in the number of grief and bereavement cases, particularly in the 2000's. This may be due to losses in the family due to the increase in HIV/AIDS in KZN. 42% of individuals in KZN were said to have died of AIDS-related deaths (Bradshaw et al., 2000). In KwaZulu-Natal, 16% of the whole population are said to be HIV positive, the highest of all provinces in South Africa (Nicolay, 2008). Of the 3.6 million orphaned children in SA, KZN has the largest percentage (26.9%). UNICEF (2013) cited the reason for most of these orphaned children to be due to HIV/AIDS. They estimate approximately 150 000 households in SA to be child-headed.
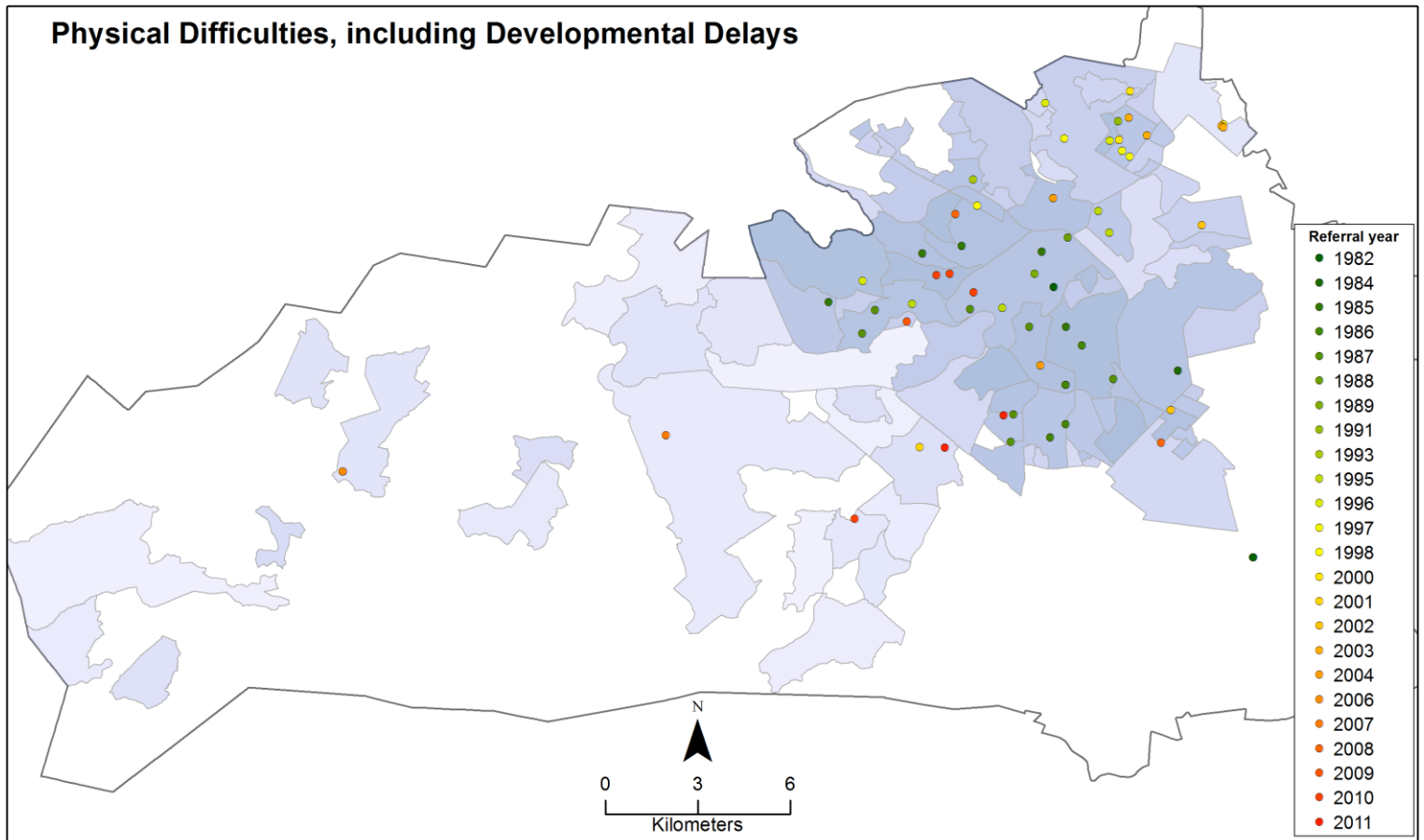
Figure 4.81. Map of physical difficulties and developmental delays per sub-place throughout the Msunduzi region

Physical difficulties seem to be a greater problem in the 1970's and early 1980's with the exception of 1998-2003 in the northern areas of Pietermaritzburg and 2008-2011 in the slightly central-western areas of PMB. This could perhaps be as a result of increasing numbers of specialists, and improved medicine. The spread of referrals for physical difficulties to more rural areas may be explained by the lack of access to the appropriate specialist for children from rural areas who cannot afford private services.

4.19.   Presenting problem over time: Social and relationship difficulties
Referred relationship, and social difficulties were tightly clustered in areas surrounding the CFC in the

1970/1980's, and referrals spread more to the surrounding sub-areas in the late 1990's and 2000's.
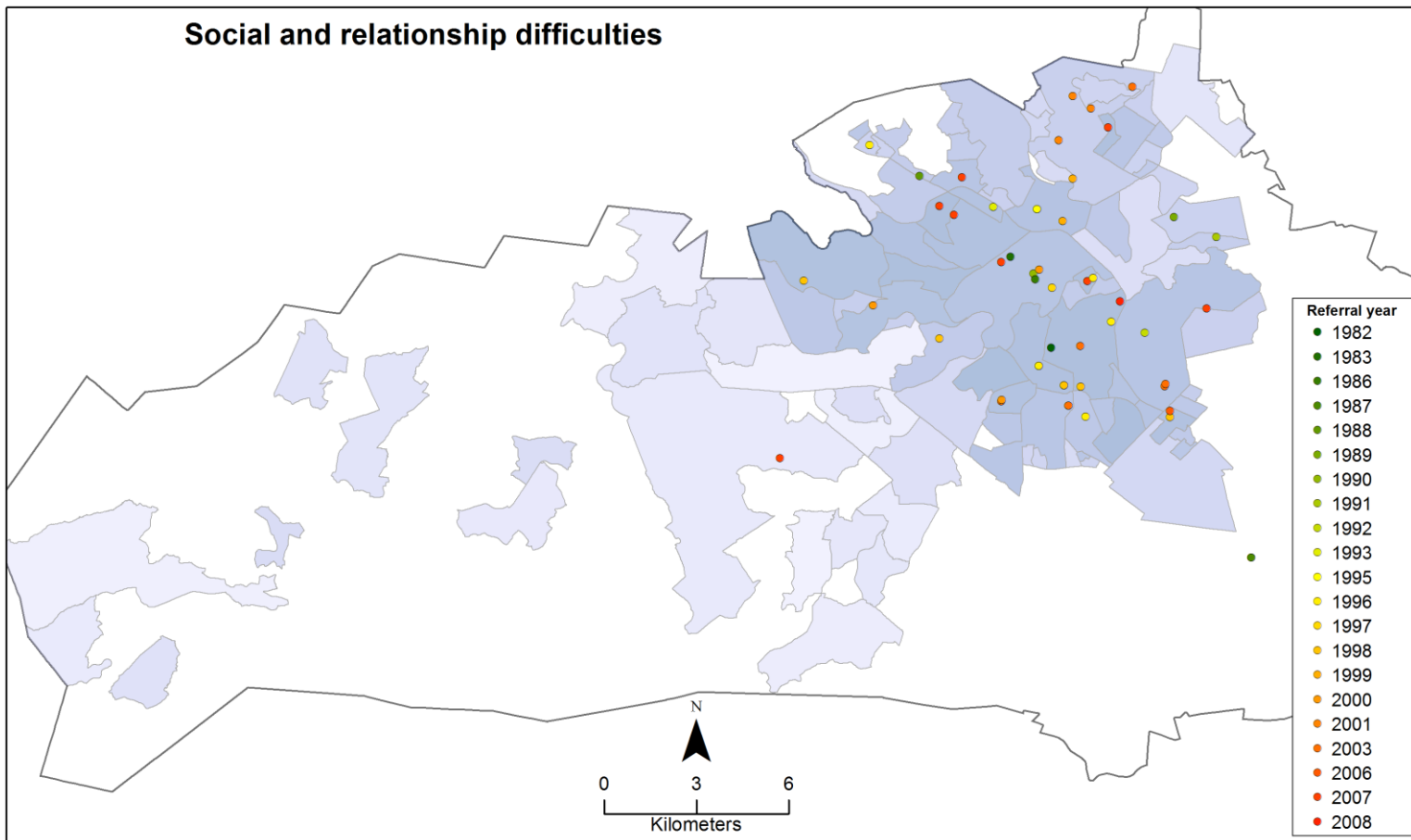
Figure 4.82. Map of social and relationship per sub-place throughout the Msunduzi region

One could hypothesise that there would be an increase in social and relationship difficulties post-apartheid as a culture of transformation and integration emerged.

There was also very little social and relationship difficulties during the Apartheid era when mainly Whites attended the CFC as they presented a very cohesive society. White attendees, unlike Black, Coloured, and Indian individuals, were (prior to 1994) not exposed to the amount of violence, inequality, discrimination and poverty associated with disruptions in social cohesion and acceptance. In addition to this, rural areas are often socially under-developed and social excluded, where social cohesion is low, and families are often torn apart by HIV/AIDS, intra-group conflict, and migrant work (KZN Department of Community Safety and Liaison, 2010). It is not surprising that there has been a gradual increase in referrals from these rural areas.

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4.10.   Presenting problem over time: Suicidal/Para-Suicide

The temporal map of suicidal and para-suicide rates shows that they are more prevalent in the outskirts of PMB CBD in latter years. Suicide has been linked to an individual's psychosocial context, including financial difficulties, low educational levels, and unfulfilment at work (ibid). Suicide is more commonly associated with unemployed and marginalised individuals.
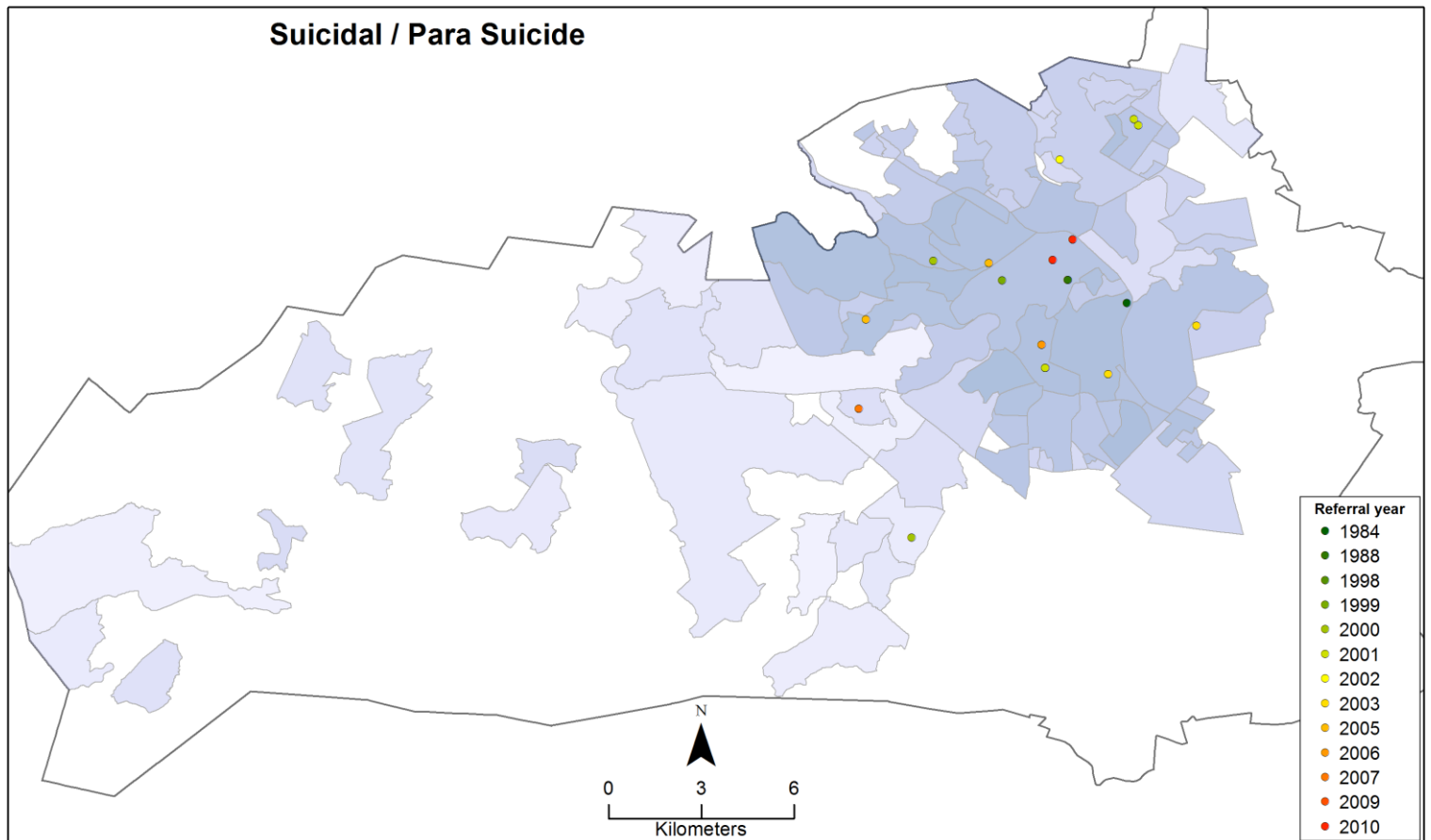
Figure 4.83. Map of suicidal clients and para-suicide per sub-place throughout the Msunduzi region

Depression, social exclusion, PTSD, poverty, low levels of education and a traumatic and violent history characteristic of these surrounding areas may account for the increase in referred suicide attempts with time, and as the referred cases extend to more rural, previously marginalised communities.

4.11.   Presenting problem over time: Trauma Debriefing/Crisis Counselling

It is evident from the map below that referred trauma cases are largely isolated to the more southern and surrounding areas. Once again, this implicates those areas with marked traumatic history of social and political marginalisation, under-development, isolation, violence and poor living conditions.
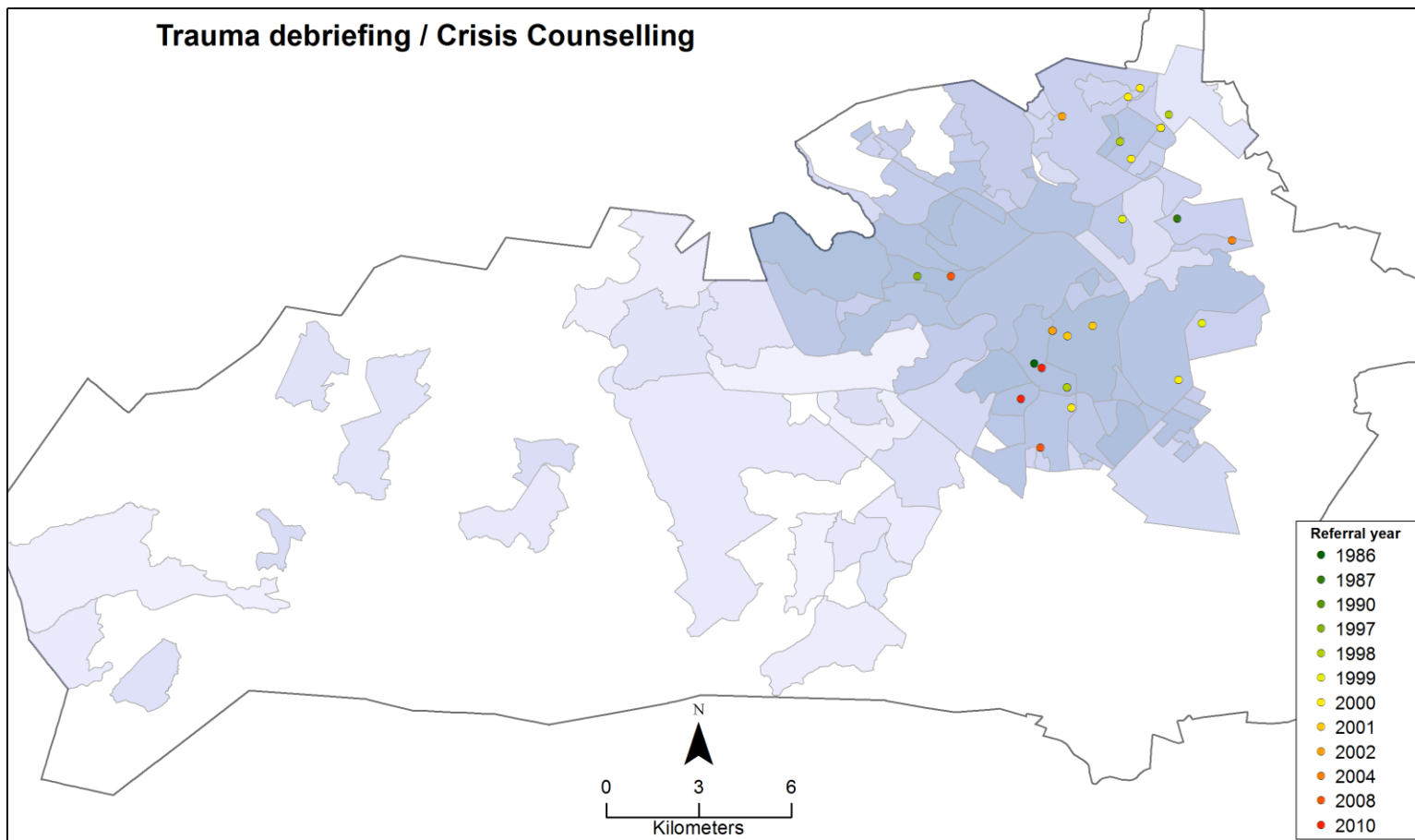
Figure 4.84. Map of trauma debriefing and crisis counselling per sub-place throughout the Msunduzi region

PTSD has become a major concern for health professionals post-apartheid. Failure to address these post-traumatic effects will have devastating consequences for the individual later on in life, and further encumber an already overburdened mental health system.

Differences in presenting problems per gender are well known. What will ensue is an exploration of the gender differences (if they exist).

4.15.   Gender and Presenting Problem

A Cross-tabulation between gender and presenting problems reveal that 64.19% of males, compared to a 35.81% of females (n = 363), presented with behavioural problems. Included within this category were 20 males, compared to 9 females referred for criminal behaviour. This is consistent with findings by Eaton *et al.* (2012), suggesting that males are more likely to display behavioural difficulties, often impulsive and destructive. Afifi (2007) notes that males are three times more likely than females to demonstrate conduct disorders. 63.63% of males compared to 36.36% of females (n = 99) presented for psychological assessment. These conduct disorders persist well into adulthood if not treated, often resulting in delinquency, crime, interpersonal problems and the like (WHO, 2003).

Similarly, 63.8% of males, compared to 36.2% of females (n = 691), presented with academic difficulties, and 63.1% of males compared to 36.9% of females (n = 65) experienced developmental difficulties and delays. These findings are consistent with an editorial posted by the American Journal of Psychiatry stating higher prevalence rates of learning difficulties and ADD/ADHD in males. Learning difficulties are considered to be such a major early childhood disorder that it has been given high priority status by the WHO (WHO, 2003). ADHD has also been given similar status. ADHD was included in behavioural difficulties in this study, and constituted a large percentage of this category.
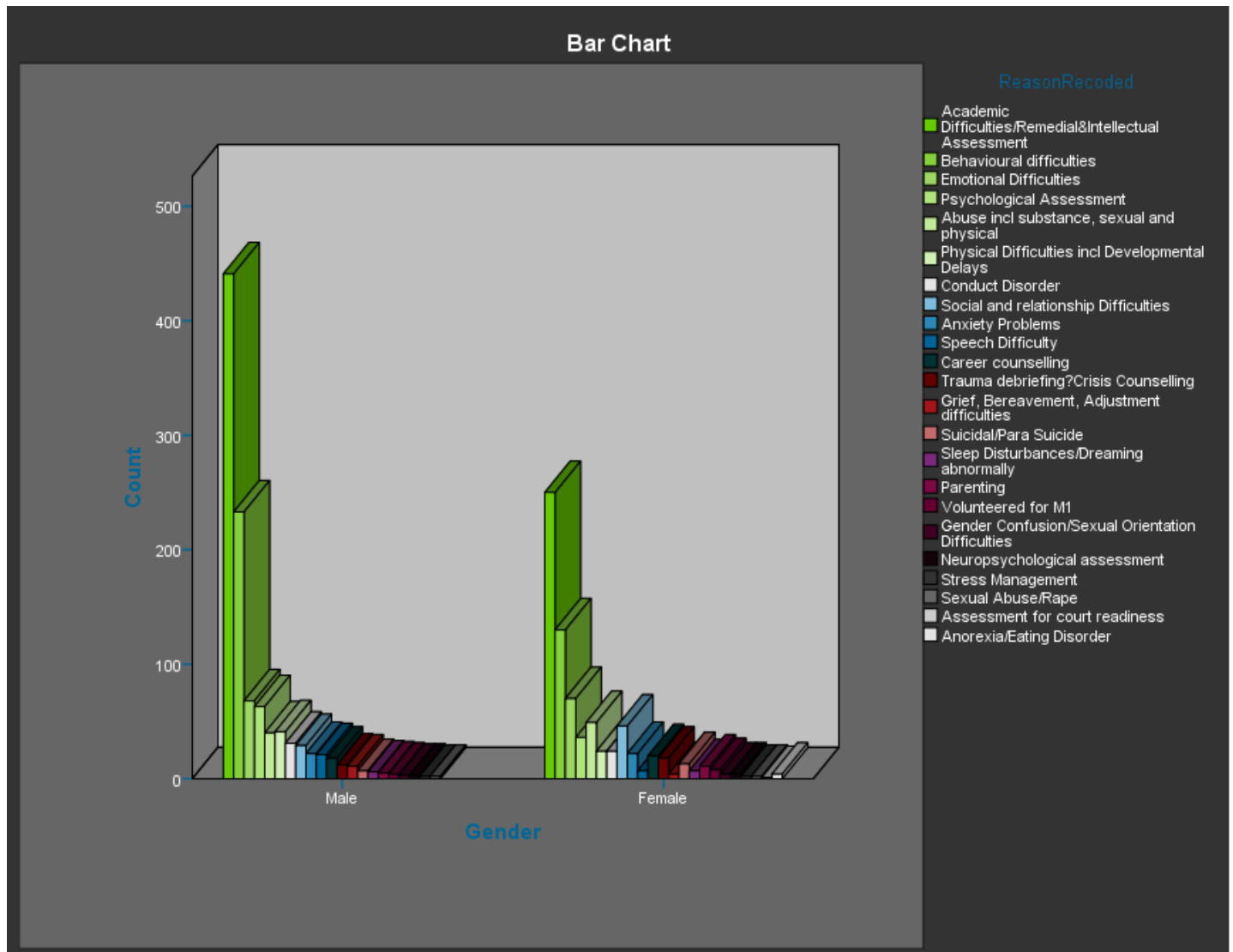
Figure 4.85. Clustered Bar Chart comparing the reasons for referral between males and females

Burman (2010) found that in general females begin to talk sooner, and more clearly than males. Males are also more likely to stutter. In this study, 75% of males, compared to 25% of females (n = 28) were referred for speech difficulties. 4 males, and zero females were referred for a lack of affect. 7 females compared to 2 males were referred for withdrawal, and detachment, and 14 males compared to 16 females were reported for anxiety difficulties. These latter findings make sense, and correlate with a study done by Eaton, *et al.* (2012) which stated that anxiety disorders in women are more likely to lead to internalisation, resulting in withdrawal, loneliness and depression. This is further reinforced

by the finding that 61.33% of females, compared to 38.67% of males (n = 75) were referred for social and relationship difficulties. In this study, anxiety disorders were more present in females at a younger age than their male counterparts. The onset of anxiety in males occurred around the age of 11, compared to females at age 7 years.

Eleven females compared to 5 males reported parenting difficulties. 65% of females, compared to 35% of males (n = 20) had attempted suicide. This is consistent with Afifi (2007) who notes females are more likely to engage in suicidal ideation, especially in adolescence. Suicide is the 3rd leading cause of death effecting children and adolescents worldwide, especially in adolescence (WHO, 2003; WHR, 2001). Further findings from this study demonstrate that most suicide attempts occurred between the ages of 12 – 17 years. 64.52% of females, compared to 35.48% of males were referred for sexual abuse, and 4 females compared to zero males were referred for eating disorders. What is interesting to note, as pointed out by Afifi (2007), eating disorders are more prevalent in females, but are also age specific, presenting itself mainly in adolescence. This study data revealed that those cases of eating disorders in females presented at ages 16, and 17, and one case at age 24 years. Further, all of the reported cases of eating disorders were White. This shows the complexity of psychiatric disorders, not only as socially embedded, but also as a result of demographic.

Six males compared to 0 females were reported for substance abuse between the ages 14 – 17 years. This finding is consistent with previous studies reporting males to have a higher prevalence of alcohol and drug abuse than females (Kessler et al., 1994). It is further consistent with findings that substance abuse is a problem predominantly in adolescence (WHO, 2003). Genders were roughly equal (68 males and 70 females) when it came to emotional difficulties. Similarly, there seemed little inter-gender difference on other reported difficulties including abnormal fears, physical abuse, self-mutilation, sleep disturbances, stress, anxiety, neuropsychological difficulties, encopresis, and career counselling. This is an interesting finding, as previous epidemiological studies (Grant & Weissman, 2007; Widiger, 2007) have suggested female prevalence for anxiety and abnormal phobias. Females, however, underwent more trauma debriefing than their male counterparts, constituting two thirds of the total. This resonates with Afifi's (2004) statement that females in general, have differential sensitive event exposure by virtue of being a female. This is not to say that they have exposure to more traumatic or stressful events, rather, that they have a higher risk of crisis.

The hypothesis:

H_o: There are no significant differences in the type of presenting problem and level of socio-economic status

H_i: There are significant differences in the type of presenting problem and level of socio-economic status

was tested, and showed significant difference in presenting problem and level of SES (F(4, 670) = 3.246, p = 0.012).

The presenting problem per sub-place highlighted important disparities in certain psychological outcomes specific to certain geographical areas in PMB. What will ensure is a presentation of some of those presenting problems that showed significant temporal geographic characteristics. Geographical disparities also implicate disparities in SES. Socio-economic status is a major determinant in psychological wellbeing (Miech *et al.*, 1994). Hudson (1995) said that the poorer ones socio-economic position is the more likely psychological disability and hospitalisation is. The American Psychological Association (2013) reported that lower socio-economic status has been associated with a higher prevalence of attempted suicide, substance abuse, emotional and behavioural difficulties, anxiety, depression, ADD/ADHD, conduct disorders, higher levels of aggression and hostility. Bradley & Corwyn (2002) found that low SES is linked to childhood behavioural problems. Hudson (2005) conducted a longitudinal study that identified that psychological illness is both directly and indirectly, through the impact of economic hardship, impacted upon by socio-economic status.

The causal nature of the SES-psychological relationship has been elusive since the first study conducted in 1939 by Faris and Dunham, who revealed the inverse SES-psychological health relationship. There are two broad approaches utilised to understand this relationship, being the selection hypothesis and the causal hypothesis (Miech *et al.*, 2008). The former refers to the tendency of psychological disorders to prevent affected individuals from obtaining higher SES status. The latter approach refers to the manner in which lifestyle and hardships, associated with low SES living, contributes to higher prevalence in psychological illnesses (ibid). Bradley & Corwyn (2002) add that persons with high SES supply their children with services, goods, social connections and parenting that benefit their children. Children of families with low socio-economic standing, on the other hand, are more likely to develop more developmental problems as they are not afforded these same opportunities. Swartz *et al.* (2006) not only found a strong link between poverty and psychological illness, but also how the lack of basic amenities contributed to relapse, and worsened psychological illness, They go on to say how unemployment and poor social welfare, social difficulties as a result of the strain of living without basic amenities, and stigma often causes anger, despair and hopelessness. Poverty is a risk factor for psychological illness (Kuruvilla & Jacob, 2007). Findings further suggest some specificity between SES and type of problem, despite the second lowest category being associated with most referral problems. Let's explore the effect of SES on referral problems further.

4.12. Socio-Economic Status and presenting problem
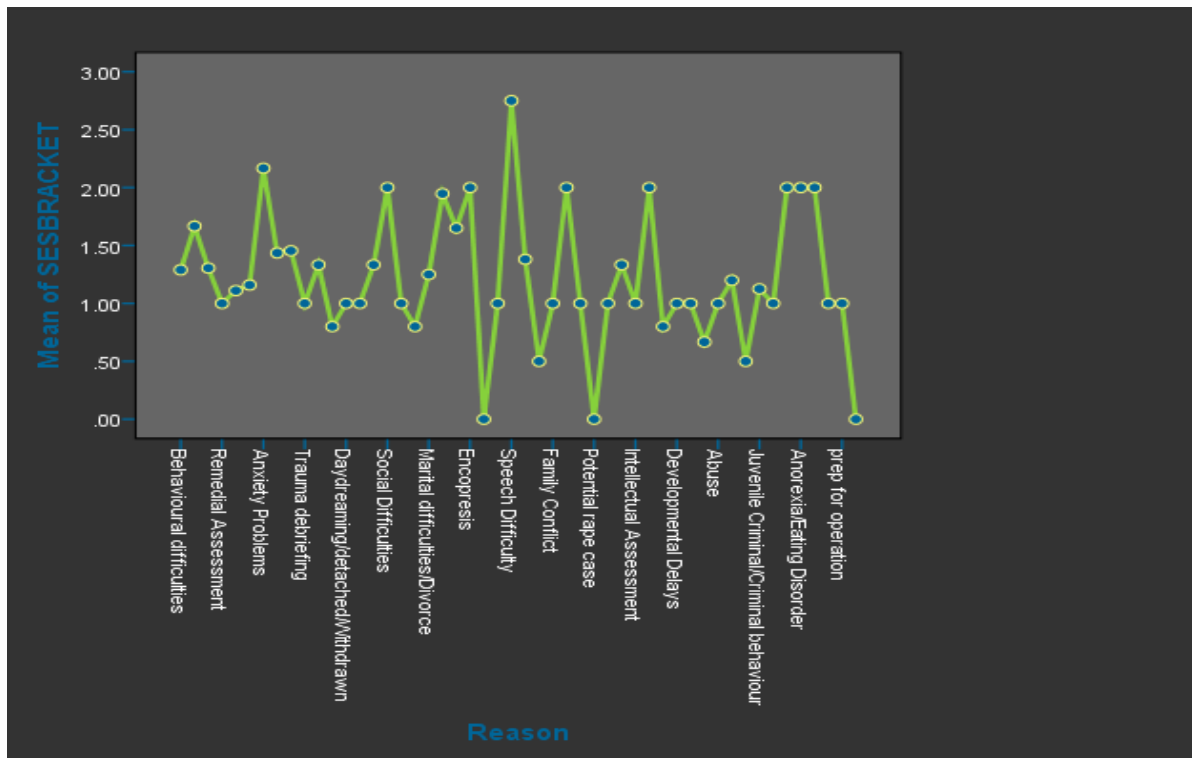
Figure 4.86. Line chart indicating the reasons for referral by SES

The hypothesis:

H_o: There are no significant differences in the type of presenting problem and level of socio-economic status

H_i: There are significant differences in the type of presenting problem and level of socio-economic status

There is a significant difference in the type of presenting problem, and the level of socio-economic status (as an aggregated measure of the terms of payment) $(F(4, 670) = 3.246, p = 0.012)$. Post Hoc tests reveal a significant difference in those classified as extremely low SES (free service) and very low and low SES. The means plot reveals that those who paid nothing (classified as extremely low SES) were most likely referred for Encopresis, potential rape case (unconfirmed as per the referral slip) and preparation for an operation. Those classified as low SES are most likely to be referred for behavioural difficulties, remedial assessment, anxiety, trauma debriefing, withdrawal, marital difficulties, speech difficulties, family conflict, intellectual assessment, developmental delays, abuse, delinquency, and preparation for an operation. Those with low- to-middle income were most likely present with social difficulties, intellectual assessment, anorexia and other eating disorders. Middle to higher income classes seem to present mainly with speech difficulty, and family conflict.

There seems to be a growing need to target resources in areas with the greatest need. In a similar vein, the geographic drift hypothesis has suggested that individuals with psychological disorders tend to move to low-income areas, attracted by the low living costs (Dembling, Rovnyak, Mackey, and

Blank, 2002, in Hudson, 2005). However, the longitudinal study conducted by Hudson (2005) found no evidence for the geographic drift theory.

Lower socio-economic status as in the case of similarly rural areas are often linked to lower levels of education. 17% of people without disabilities obtain higher degrees, compared to a mere 6% in people with disabilities (US Census Bureau, 2006).

Kuruvilla & Jacob (2007) stated that individuals with lower SES are twice as likely to suffer from a major depressive disorder as their highest SES counterparts. Higher SES status is, however, linked to a higher prevalence of Bipolar disorder. Those individuals with lower SES standing, where they have experienced poverty for long periods of time were more likely to suffer from minor or non-psychotic psychiatric morbidity (especially anxiety and depression). These differential findings in referral problem and SES beckons the need to investigate, and tailor programs to better meet these needs unique to a client's SES disposition.

Conclusion

The primary findings indicate that there have been significant changes in CFC users over time. Presenting problems, socio-economic status, race, gender composition, schools attended, place of residence, referee and marital status of caregivers were all significantly different over time.

Furthermore, there has been a change in the spatial characteristics of CFC users, as there seem to be more users residing further away from the CFC in more recent years. The maps also indicate changes and differences in psychological health difficulties per sub-place. The land formerly reserved for Black people (Western parts of Msunduzi) are significantly under-serviced by the CFC despite having similar population densities to PMB CBD, which is well serviced. There are significant differences in presenting problems, client SES and gender. There has also been a link between particular psychological health outcomes and place. As the client demographic spread to the outskirts of the Msunduzi region, so does the type of presenting problem change. This means that there are hotspots requiring specific psychological health interventions.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

This, the closing chapter, will summarise the primary findings with reference to the literature and discussions presented in the previous chapter. A discussion of the primary findings will ensue, and recommendations based on this discussion made.

5. Summary of Findings

5.1. Demographic changes

5.1.1. Grade

Grade R – Grade 7 constituted 72.7% of clients, and the highest percentage of clients are in grade 2 and 3 (33%). These statistics make sense, given that the focus of the CFC is to provide services to children, and suggest tailoring programs to school-going children if CFC wishes to keep its focus on this particular age group. The other alternative may be to address the gap in service provision for senior and high school pupils. There needs to be a concrete program focus outlining exactly which clientele the CFC wishes to service, the types and level of interventions to be implemented, and feedback measures, monitoring and valuation systems firmly in place to ensure maximum resource utilisation, and maximum impact. Further, there needs to be a constant updating of the CFC database and analysis of program user data in order to ensure programs remain relevant in a constantly changing society.

5.1.2. Gender

There was a significant difference in males and females over time (in years). Overall, 58% of the sample was male, and 42% female. The overall frequency of males attending the CFC was higher than their female counterparts since 1977. Female attendance only surpassed male attendance in 2009. The forecast model shows a decline in male attendees to 2016. This is an interesting finding, and could be indicative of the empowerment of females in society as a whole. This change in demographic once again points to the need for tailoring programs to best meet the changing needs of ever-changing CFC attendees.

Boys presented with more difficulties than girls between the ages of 4 and a half to 18 years, and girls reported more psychological difficulties after age of 19. There was a difference not only in the nature, but also the year of onset, of psychological illnesses between boys and girls. Boys presented with more behavioural, criminal, academic, and speech difficulties, lack of affect, substance abuse and withdrawal. Girls, on the other hand, presented with more anxiety, social and relationship difficulties, para-suicide and suicidal ideation, eating disorders, and were most frequently the victims of sexual abuse. There heralds a need to tailor programs by gender not only in terms of the type of presenting problem, but year of onset too. In other words, to effectively reduce risk of mental health onset and effects, strategies cannot be gender neutral. This highlights a need to consider mental illness as beyond a disease of the brain.

5.1.3. Race

There was a significant difference in race over time (in years). More than half the sample was White, however there was a trend showing a gradual decline in the number of White CFC attendees, roughly since 1996. Mainly White people attended the CFC from inception until 1993, and were only surpassed by Black attendees around 2009. Black CFC users only started attending the CFC in January 1986, and showed a rapid incline from May 1994. Since then, there has been a steady increase in Black CFC attendees, and an inward migration of Black CFC attendees in more recent years from more central areas. The reasons for these changing migratory patterns could be multiple. One hypothesis is that there has been an increased movement of Black individuals into the traditionally White central areas of PMB. Another hypothesis could be that, as schools constituted the highest referral body, (despite showing a decline in referrals since 2009), due to their established ties with the CFC, are now being attended by Black children, thereby increasing the number of Black referrals made to the CFC. Evidence of this is the significant change in referral bodies by race. Another hypothesis could be that there has been an increased knowledge of mental illness, and associated decline in stigma. This hypothesis is however indiscernible. None the less, the increasing trend of Black CFC attendees may suggest a change in the type of problems presented with due to differences in socio-political and economic history. This change in psychological needs would invariably require an adjustment of CFC programs to make them more suitable and responsive to these changing needs. Programs sensitive to the socio-economic and political history, and the resultant mental health difficulties, need to be developed, implemented and evaluated.

5.1.4. SES

The average amount paid per consultation was R46, with a standard deviation of R41.43. This is far less than a consultation with a Psychologist in private practice would otherwise be. Further, 91.9% of all attendees did not have Medical Aid. This means the CFC's objective to provide psychological services to those children in need of it, but who could least afford it, is being met. The CFC will need to decide whether to continue with the minimal cost strategy going forward, or a set a price for consultations, still below private practice fees, to facilitate systematic budgeting of program planning and implementation.

There was a significant difference in presenting problem and level of SES. There has been a steady incline in the number of White CFC clients with low SES. There has also a steady incline in those White CFC attendees with very low SES from roughly around 1995. Black CFC attendee SES was extremely low, very low and low SES seems to be rather steady over time. The low-middle class seems to increase from roughly around 2007. This means that there has been a shift in the per capita income between races. Black people seem to be on the incline, whereas White CFC attendees seem to be experiencing a decline in per capita income. This change in inter- and intra-race per capita income has implications for CFC program implementation. Due to differences in the type of presenting problem and the level of socio-economic status (as an aggregated measure of the terms of payment)

to remain relevant, the CFC will need to change its focus on presenting problems to accommodate those psychological difficulties most often affiliated with low to extremely low SES.

5.1.4. Familial structure

There was a decline in referrals made from parents and an increase in the predicted number of separated parents. More than a third of CFC clients attended their first consultation with their mothers alone. Clients of single parents of very low, to low SES status showed to have the highest prevalence of psychological difficulties. These findings suggest not only that the socio-economic standing of target clients should be considered when designing programs, but that changes in the familial structure of CFC clients, and their associated psychological support, requires a tweaking of programs that bear cognizance of the effect of poor family structure on mental health. The predicted trend showing a decline in the SES of White people, and a slight incline for Black people further illustrates the shift in demographic profiling of existing CFC clients. This demands that the relevance of existing and current CFC programs be evaluated with reference to these changes. Unless the CFC decides to change its focus on providing services to low SES status clients, the psychological difficulties unique to low SES need to be considered when informing program focus and development.

According to the KZN Department of Safety and Liaison (2010), as a result of high levels of unemployment in rural areas, there has been an increasing number of males who have resorted to internal migrancy. As the migrant worker status of most families in rural areas increases, this problem of poor family support will be exacerbated. This coupled with the current HIV/AIDS pandemic and drastic increase in AIDS orphans, especially in KZN, requires that the CFC shift focus to provide families with the psychological support they need. As there is an increase in HIV/AIDS, orphaned children, child-headed households, family conflict, and abuse, there is an increase need for programs directly addressing these issues. This marks a change in the type of programs traditionally implemented by the CFC, and shows the importance of remaining relevant. The decrease in socio-economic standing, coupled with the increase in the number of separated parents, requires that programs address particularly those children of single-headed households who have an increased susceptibility to developing mental illness. By shifting focus, it allows the CFC the opportunity to change its focus to a preventative, rather than a curative model.

5.1.5. Presenting Problems

The top three reasons for referral were Behavioural (17.1%); Academic (16.9%); and Educational Assessment (14.8%), with a predicted increase of academic difficulties for 2016.   There were significant differences in these presenting problems over time.

5.1.5.1. Abuse (Substance, sexual, and physical)

A decentralised (outward motion from PMB CBD) trend in abuse (sexual, physical, substance) was noted in latter years. The high prevalence of abuse, especially as it is coming from the more rural areas that are already under-serviced, requires special attention/focus

5.1.5.2. Academic

There was a significant difference in academic difficulties over time (in years), predominantly between the 1970's and the late 1990's and 2000's. There was an increase in academic difficulties in the more rural areas in latter years. The predicted increase in educational/academic difficulties requires a closer collaboration with schools, and closer identification of children battling academically. The change in academic needs between the 1970's and the late 1990's/2000's suggests an upgrade in educational programs to better fit the needs of the current day scholar. Similarly, an increase in academic difficulties in general, and especially from rural areas expresses the increased need not only for education based programs, but also, extending the reach of these programs to the more rural, previously under-privileged and ill-resourced areas. Children of parents who are illiterate, as is the case for most children in rural areas, are more likely to battle academically (Menheere & Hooge, 2011). This lack of academic support as a result of previous policies barring Black people from receiving an education on par with White people, not only emphasises the long-lasting effects of Apartheid on mental health difficulties, but also emphasises the need for CFC to reconsider the relevance of their programs in light of the current demographic changes. The predicted increase in academic difficulties already demonstrates the change in need for particular programs.

5.1.5.3. Behavioural

The nature of behavioural difficulties has changed over time. These differences have occurred mainly between 2007 and the 1970's, 1991, 2010 and 2011. The cause for such changes remains unknown, but could be accounted for by socio-political changes between former and later years, change in SES, and demographic changes over time. This temporal change in the nature of behavioural difficulties requires a tweaking of any programs aimed at addressing these problems to make them more relevant to the change in target recipients.

5.1.5.4. Physical difficulties

Physical difficulties seem to have been a greater problem in the 1970's and early 1980's with the exception of 1998-2003. This may be due to the improvements made in medicine since the 1970/1980's, and the specialisation of medical officers. Perhaps the CFC should attempt to establish collaborations with other UKZN interns from the medical field (based primarily in Nelson Mandela School of Medicine, Durban) in order to better meet client physical needs to provide a more holistic treatment plan, and ensure that childhood difficulties impeding their progression and development into adulthood are minimised.

5.1.5.5. Other temporal changes in presenting problems

As more Black and Indian attendees attended the CFC, so too did the CFC geographical reach increase. There was an increase in the number of grief and bereavement cases, particularly in the 2000's. There was also an increase in the number of referrals for relationship and social difficulties in surrounding sub-areas in the late 1990's and 2000's.

The temporal map of suicidal and para-suicide rates shows higher referral rates from the outskirts of PMB CBD in later years. Trauma was largely isolated to the areas to the south of the PMB CBD. Depression, social exclusion, PTSD, poverty, low levels of education and a traumatic, violent history characteristic of these surrounding areas may account for this increase in suicide attempts over time, and as referrals extended to more rural, previously marginalised communities. These trends reflect the trauma and loss associated with the psychosocial, economic and political history of these areas traditionally reserved for the exclusive use of Black people. The violence and trauma in these areas are well documented in the literature, and are evident in the primary data. Together with the decline in familial support and breakdown in the familial structure previously mentioned, marks an increased need for programs to assist individuals and families to improve their social and relationship integrity.

The previously noted depression, social exclusion, PTSD, poverty, low levels of education and a traumatic and violent history characteristic of these traditionally Black areas require tailored interventions specifically aimed at trauma counselling and debriefing.

Due to these changes over time, and the extent of CFC reach spreading to different SES areas with different socio-political histories; tailoring CFC programs, and therapies to better equip clients to deal with their challenges is required.

Time Series/Forecasting models are useful to determine trends pre- and post- intervention, and could be useful to determine any changes that the CFC programs may bring about, thereby help with the M&E component required of future interventions. Further, the effect, or impact, of the program will be able to be accurately measured using forecasting.

5.2. Geographical changes

The highest frequency of visits came from areas closest to the CFC. There are very few CFC clients from Edendale, and areas extending further west. This is indicative of limited CFC service reach as reach was limited to areas closest to the CFC. Even over time, this trend showed little change. In more recent years there was a slight movement away from the areas closest to the CFC, however, there is inadequate reach for those rural areas traditionally reserved for Black people. This could be as a result of the highest referral body being schools that had close ties with the CFC, issues of access, and so forth. These findings are therefore not surprising given the location of the CFC in relation to schools at which CFC interns were placed, but it does indicate a need to start accessing clients beyond the pre-existing immediate-proximity catchment area. Given that psychological health institutions are usually situated in formerly predominantly White areas, means that, other than PHC's which have shown to be limited in their ability to detect and deal with people suffering from mental illness, people within these areas have limited access to help. Barriers to service uptake need to be further explored by the CFC. Perhaps issues of access related to lack of funding, resources, knowledge of the CFC amongst others could be explored. If the CFC shifts its focus to extending its

reach to more rural areas, it needs to consider all of these factors when trying to improve uptake, especially in rural areas where mental illness largely remains stigmatised. It is important to note that this retrospective data has been skewed by the relationships established with schools closest to the CFC, as they were CFC intern placement and referral sites.

In more recent years, Scottsville Primary no longer has CFC interns as they have employed full-time school counsellors. This could account for the overall decrease in referrals coming from these schools. It does however demonstrate that when qualified professionals are placed on site, there is an increase in identification, and referrals. This suggests that perhaps the CFC should look at placing interns, and establishing relations with, schools further than a 5km radius.

Important decisions need to be made regarding the CFC's next steps. Possible avenues to explore could include:
- Extend service reach to traditionally Black areas like Edendale, Vuliundlela, and Plessilaer, especially as these areas are reported to have excessively high crime statistics;
- Establish new relationships with different schools within the Msunduzi region; and
- Reinforce existing collaborative relationships with schools, and increase awareness of CFC services in these and other schools.

If the first option is to be followed, a collaborative partnership with schools outside of the usual cluster close to the CBD, particularly Edendale, Vulindlela, and Plessislaer, needs to be established. One could only hypothesise that there would be marked differences in the needs and nature of problems school children from these areas are presenting with given their different psycho-social, economic and political history, and lack of resources and infrastructure. This requires that schools be consulted when gauging the most prominent psychological difficulties that need to be addressed by CFC programs. In addition, the mode of therapy needs to change if more clients from rural areas are to be referred. The reason for this is that the derived benefits from therapy need to increase rapidly as the frequency of visits are limited due to access, and as demonstrated by the frequency rose diagram.

Even though the prevalence statistics cannot be gauged using the referrals made to the CFC, and geographic changes and trends do not tell us the geographic population characteristics of prevalence and incidence, they serve as a good marker for CFC reach, targeted CFC intervention, and service user profiling. They have showed the need for CFC to change its focus to more rural areas where multiple factors not only contribute to a predisposition for mental illness, but also exacerbate existing illnesses.

This study has demonstrated the use of Geographic approaches in understanding CFC client profile changes and should be employed going forward to understand the nature of presenting problems per geographical area. Targeted interventions should take on a sub-area focussed approach, tailoring it for geographically specific needs

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APPENDIX A: ETHICAL CLEARANCE LETTER

UNIVERSITY OF ™
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

31 January 2013

Ms Janine-Lee Upton 204506656
School of Applied Human Sciences – Psychology
Pietermaritzburg Campus

Protocol reference number: HSS/0032/013M
Project title: Integrating spatial, temporal, referral problem and demographic approaches to evaluate the Pietermaritzburg Child and Family Centre.

Dear Ms Upton

Expedited Approval

I wish to inform you that your application has been granted full approval.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

....
Professor Steven Collings (Chair)

/px

cc Supervisor Vernon Solomon
cc Academic leader
cc School Admin.

Professor S Collings (Chair)
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Founding Campuses: ■ Edgewood ■ Howard College ▪ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS

APPENDIX B: NORMALITY TABLE

Tests of Normality^c

	Kolmogorov-Smirnov^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Date_of_Birth	.222	8	.200[*]	.940	8	.612
Grade	.216	8	.200[*]	.952	8	.734
Gender	.455	8	.000	.566	8	.000
Race	.455	8	.000	.566	8	.000
Marital_Status	.455	8	.000	.566	8	.000
Home_Language	.513	8	.000	.418	8	.000
Clients_level_of_education	.260	8	.118	.914	8	.384
Clients_present_Activity	.513	8	.000	.418	8	.000
School_Name	.238	8	.200[*]	.835	8	.067
Employers_Name	.513	8	.000	.418	8	.000
Referee	.513	8	.000	.418	8	.000
Reason	.381	8	.001	.735	8	.006
DateofReferral_ServiceRequest	.342	8	.007	.762	8	.011
DateofFirstConsultation	.308	8	.024	.790	8	.022
NoOfVisits	.167	8	.200[*]	.872	8	.159
DateofTermination	.308	8	.024	.790	8	.022
ConsultationPostTermination	.455	8	.000	.566	8	.000
NoOfVisitsPostTermination	.368	8	.002	.553	8	.000
TermsofPayment	.284	8	.057	.769	8	.013
CareGiverRelationship	.513	8	.000	.418	8	.000
Years	.220	8	.200[*]	.950	8	.713
Medical_Aid	.455	8	.000	.566	8	.000
Marital_status_Caregiver	.374	8	.002	.758	8	.010
Address	.284	8	.057	.832	8	.062

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

c. Initial_consultation_with is constant. It has been omitted.

APPENDIX C: FORECAST FOR BLACK CFC ATTENDEES

Forecast		2012	2013	2014	2015	2016
Model		2012	2013	2014	2015	2016
Black-Model_1	Forecast	17	17	18	19	19
	UCL	33	34	35	36	37
	LCL	2		-1	-2	-3
For each model, forecasts start after the last non-missing in the range of the						

APPENDIX D: FORECAST FIGURES FOR TOP THREE REFERRAL SCHOOLS

Forecast						
Model		2012	2013	2014	2015	2016
Clarendon-Model_1	Forecast	3	3	3	4	4
	UCL	7	7	7	7	7
	LCL					
Ridge-Model_2	Forecast	1	1	1	1	1
	UCL	4	4	5	5	6
	LCL	-2	-2	-3	-3	-4
Scottsville-Model_3	Forecast	2	2	2	2	2
	UCL	5	5	5	5	5
	LCL	-1	-1	-1	-1	-1

For each model, forecasts start after the last non-missing in the range of the requested estimation period, and end at the last period for which non-missing values of all the predictors are available or at the end date of the requested forecast period, whichever is earlier.

APPENDIX E: Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Date_of_Birth	1877	1943	2010	1985.08	9.319
Grade	1537	0	27	5.86	5.778
Gender	1922	1	2	1.42	.494
Race	1731	1	4	1.77	1.063
Marital_Status	1844	1	8	4.79	2.877
Home_Language	1653	1	18	1.46	1.052
Clients_level_of_education	1163	1	23	5.72	3.437
Clients_present_Activity	1580	1	5	3.85	.581
School_Name	1466	0	229	54.96	52.223
Employers_Name	1974	0	32	.27	2.393
Initial_consultation_with	1486	1	23	8.34	7.899
Referee	1801	0	48	10.85	8.967
Reason	1867	1	100	13.58	14.613
DateofReferral_ServiceRequest	1967	1905	2025	1996.31	8.523
DateofFirstConsultation	1806	0	2025	1995.22	47.660
NoOfVisits	1602	0	119	7.38	7.137
DateofTermination	482	0	2018	1975.92	222.141
ConsultationPostTermination	1974	1	2	1.99	.103
NoOfVisitsPostTermination	53	0	42	4.06	8.170
TermsofPayment	721	0	473	46.00	41.431
CareGiverRelationship	1917	0	25	10.22	10.051
Years	1813	0	258	10.78	8.580
Medical_Aid	1974	1	2	1.92	.273
Marital_status_Caregiver	1540	1	6	2.25	1.073
Address	1669	0	195	49.12	46.709