

An Empirical Investigation on the Provision of Non-Emergency Patient Transportation Services in South Africa

(A Case Study of Mafikeng Provincial Hospital)

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Abstract

Accessibility to health care is one of the critical global developmental concerns. In this regard, the lack of provision of effective and efficient non-emergency patient transportation is one of the many access barriers to health care with multiple implications on the medium to long-term wellbeing of patients. This access to health challenge is even a bigger problem for individuals or group of individual with chronic medical conditions in socially vulnerable communities, as they are required to travel regularly to obtain treatment. In this view, it becomes necessary that health care system transformation initiatives that are aimed at improving accessibility and achieve universal access to health seek to address this need.

This research study is warranted by inadequate academic research to inform the transportation planning approaches in support of healthcare reform programmes. In the context of South Africa, this is especially needed in the wake of the formulation of the National Health Insurance Policy (NHI) with a strategic goal to maximise universal access to healthcare.

The study aim was to identify the non-emergency patient transportation needs and the extent to which such needs are being met in South Africa. The study further identified priority areas of interventions with the aim of contributing to the refinement of the objectives of the National Health Insurance Policy, and complementing its vision for universal access to health care. The research study adopted an empirical approach on the requirements for the provision of non-emergency patient transportation services in South Africa. The research study was case based and disease oriented. As one of the emerging chronic conditions that is considered have catastrophic implications on national health profile, and one that requires a high frequency of travel to obtain treatments, Chronic Kidney Disease was chosen for this research study. Given the structure of the research questions and literature discussions, a pragmatic research analysis was adopted. In this regard, a sequential, explanatory mixed methods approach was used to collect and analyse data. Semi-structured interviews and structured self-completed research questionnaires were used for primary data collection. The surveys were of a cross-sectional nature. Grounded theory was used for qualitative data analysis, while descriptive statistical analysis and IPA were used to determine the extent to which the identified renal dialysis patient travel needs have been met and to identify areas of potential intervention.

The outcomes of the research study are presented as descriptive phenomenological-correlated findings. Accounts of patients, public transportation operators, treating doctors and hospital

management are qualitatively and quantitatively analysed. Based on the research findings, this research study concludes that the lack of provision of effective and efficient non-emergency patient transportation services at Mafikeng Provincial Hospital is indeed a barrier to the accessibility of health care services. While the provision of non-emergency patient transportation has been established as a potential barrier in extant literature, the nature of this barrier is made clearer in this study within the South African context. Research findings shows that, unless non-emergency patient transport services are explicitly designed to cater for specific needs of patient travel, provisions for healthcare access remain critically incomplete, and may in fact, serve to worsen patient conditions.

The research study recommends development of a robust, effective and efficient non-emergency patient transportation system as one of the many accessibility to health care factors that is required to achieve universal access to health in the country. In particular, transportation service design must take explicit account of operational needs of patient treatment requirements. On short to medium term interventions, provision of a dedicated renal dialysis patient travel financial subsidy and upgrading of the health services at MPH and other health facilities that serves as referring points to MPH were found to be the most desired in order to offset the considerable high travel costs, health and safety risks on the patient account. The research study also identifies areas of further research that are required to advance the incorporation of patient travel needs in non-emergency patient transportation service design.

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List of Acronyms and Abbreviations

AIDS	:	Acquired Immune Deficiency Syndrome
CBD	:	Central Business District
CKD	:	Chronic Kidney Disease
CMS	:	Centre for Medicare & Medicaid Services
COGTA	:	Cooperative Governance and Traditional Affairs
CSIR	:	Council for Scientific and Industrial Research (South Africa)
DDG	:	Deputy Director General
DHS	:	District Health Systems
HAPI	:	Health and Places Initiative
HRC	:	Human Rights Commission (South Africa)
HIV	:	Human Immunodeficiency Virus
HPT	:	Health Transformation Policy
ICDM	:	Integrated Chronic Diseases Management
MDGs	:	Millennium Development Goals
MPH	:	Mafikeng Provincial Hospital
IPA	:	Importance Performance Analysis
NCOSS	:	New South Wales Council of Social Service
NDoH	:	National Department of Health (South Africa)
NDP	:	National Development Plan
NHI	:	National Health Insurance
NEPTS	:	Non-emergency Patient Transportation Services
NHS	:	National Health Services
NHIB	:	National Health Insurance Benefits
NWDoH	:	North West Department of Health (South Africa)
PHC	:	Primary Health Care
TOD	:	Transit Oriented Development
TRB	:	Transportation Research Board
SPSSx	:	(Statistical Packaging for Social Science)
Stats SA	:	Statistics South Africa
SDGs	:	Sustainable Development Goals
UN	:	United Nations
WHO	:	World Health Organisation

Definition of Terms

Chronic diseases: Epidemics that take decades to become fully established. They have their origins at young ages; given their long duration, there are many opportunities for prevention; they require a long-term and systematic approach to treatment; health services must integrate the response to these diseases with the response to acute, infectious diseases. (World Health Organisation, 2005).

Health System Transformation: Health System Transformation Initiatives refer to the various legal, policy and health-related disease initiatives whose main objectives are to improve access to health care services (WHO 2010).

Non-emergency patient transportation: The definition of ‘non-emergency patient transportation’ adopted in this research study encompasses all community-based transport services for patients who are regarded as non-emergency cases, including government-funded services through local health districts, unless otherwise specified (Adopted from the Council of Social Service of New South Wales, Transport to treatment for people living with a chronic disease paper, 2015).

Planned Patient Transportation Services Type A: Defined within the context of this research study, it refers to non-emergency patient transportation services that provide inter-health facility transportation service (MPH- Department of Transport, 2017).

Planned Patient Transportation Services Type B: Defined within the context of this research study, they refer to non-emergency patient transportation services that pick up patients from their homes and take them to health facilities, and services that pick up patients from health facilities after treatment and take them to their various homes (MPH- Department of Transport, 2017).

Public Transportation: refers to the forms of transportation available to the public, including all activities that operate on fixed routes and charges set fees (en.oxforddictionaries.com, 2018; www.collinsdictionary.com, 2018).

Repeated Treatment: regular treatment regime prescribed to an individual who has visited the facility, been diagnosed and placed on an outpatient programme (Mothlabane,K, DDG, Health Services NWDoH, 2016).

Universal Access: the right to access quality health services based on need and not socio-economic status (NHI, South Africa, 2015).

Service Coverage: refers to the extent to which range of quality health services necessary to address the health needs of the population are covered (NHI, South Africa, 2015).

CHAPTER 1: INTRODUCTION

1.1 Introduction

Provision of effective and efficient non-emergency patient transportation services is viewed as one of the important factors to maximise access to health care, especially for individuals with chronic conditions, as they require to travel regularly for their treatments. In the USA and Britain, it was estimated that more than 3.6 million and 1.6 million people respectively are denied timely access to health care due to non-emergency patient transportation-related challenges (Wallace et al 2005, Wilkem et al 2014, NHS 2006). While similar statistics appear to be scarce in the case of South Africa, the Human Rights Commission of South Africa acknowledges that access to health care in the country, especially for the poor, is severely constrained by expensive, inadequate or non-existent transportation services (HRC, 2007). Apart from high morbidity and mortality rates, lack of provision of effective and efficient non-emergency patient transportation services can result in high medical costs, as non-emergency medical conditions transform into emergency medical conditions due to missed treatments, poor individual health, and exclusion from social and economic participation amongst other factors necessary for maintenance of wellbeing. In other words, lack of effective and efficient non-emergency patient transportation services can be a barrier to access to health care, which can lead to various poor health outcomes (Smith et al, 2017, Ursulica, 2016, Rosen et al, 2007, Wilkem et al, 2014, Wallace et al, 2005).

Despite the United Nations declaring access to health care as an international human right, which became the primary driving factor towards health system reform worldwide (UN1947), one of the major arguments raised in relation to continued poor health outcomes of epidemiological profiles of countries in some studies, including Benatar (2013), Frenk et al (2012) and WHO (2010) is the view that health system transformation initiatives have not sufficiently addressed the need for the integration of various factors of access to health necessary to achieve universal access to health, including provision of effective and efficient non-emergency patient transportation services (Harnack, 2014).

In South Africa, while the lack of non-emergency patient transportation services is acknowledged to be a barrier to improved access to health, it appears that broader transportation planning, academic research and health system transformation agendas in the country have inadequately addressed this need. For example, while there are some literature studies on patient transportation, including Corcoran et al (2012), Mashiri et al (2008) and Rosen et al (2007), the

studies remain focused on highlighting the importance of this need without providing innovative initiatives that might improve access to non-emergency patient transportation services and access to health care. On the other hand, initiatives such as provision of planned patient transportation services in the North West Province, and attempts to the provision of accessible transportation services in Cape Town, Tshwane and Nelson Mandela Bay, remain territorially bound. Their benefits might not necessarily be realised on a national scale with the same standards or services (Access Exchange International 2009, Republic of South Africa Government 2014). This situation could reduce the essence of the objectives universal access to health care in the country.

Nonetheless, countries such as the USA, Britain, Canada and Australia have acknowledged the importance of providing effective and efficient non-emergency patient transportation on improving accessibility to health care. These countries have made provision for this need in their various national health insurance programmes. However, how to serve this need is not universal, as many of the approaches remain context specific. As for South Africa, while the NHI acknowledges the importance of mobility services to achieve universal health coverage, the policy lacks details as to how this need will be achieved (NHS, 2006, Health Canada 2005, 2011; NHIB 2015, Government of Australia 2002, 2016; Chisholm-Smith 2014, 2016; NHI 2017).

Within the context of these discussions, this research study is an empirical investigation into the provision of non-emergency patient transportation needs for renal patients at Mafikeng Provincial Hospital. The research study sought to identify non-emergency patient transportation needs and the extent to which such needs have been met in South Africa. The research study further attempts to identify areas of potential interventions from an operational and policy perspective. The main aim of the research study is to contribute to the universal access to health agenda as advocated for in the National Health Insurance Policy of South Africa.

1.2 Background

Notwithstanding the implications of various diseases on social, economic and health profiles global-wide, the World Health Organisation's report in 2005, titled "*Preventing Chronic Diseases : A Vital Investment*" highlights that the impact of chronic conditions on global health is continually increasing and requires urgent attention. It was estimated that more than 36 million deaths worldwide are because of chronic-related conditions, and that approximately 80% of the mortalities are in low to medium-income countries (WHO, 2005). For South Africa, it was estimated that 50% of deaths and 33% of the burden of diseases in the country are attributable to chronic conditions and that these poor health outcomes are expected to rise with 15% between

the years 2010 - 2020 (WHO 2005, Van Zyl et al 2012, Hoffman et al 2014). These studies strongly suggest that the need to address the impact of chronic diseases in low to medium income countries, including South Africa, remains important for improving access to health care and combating poor health outcomes.

Given these poor health outcomes, the World Health Organisation in 2005 acknowledged that there is need for a paradigm shift in the ways in which health care service delivery are rendered. This view is further asserted by South Africa's Minister of Health, Dr Aaron Motsoaledi, who declared chronic conditions as a national catastrophe that requires concerted effort to meet the diverse health needs of the affected people (Motsoaledi, 2015). In this regard, the World Health Organisation further emphasised the implementation of the Integrated Chronic Diseases Management Programme that was introduced in 2001. South Africa adopted and began the implementation of ICDM in 2014 in attempts to improve accessibility to health care for chronic conditions (DoH, 2014). As to the extent to which ICDM has been successfully implemented in South Africa, remains an area of further research.

1.2.1 About Chronic Conditions

The World Health Organisation defines chronic conditions in terms of their features, partly as diseases that involve a long time of consistent and systematic treatment. While some of the conditions can be treated within a short period, some of the chronic conditions will require a lifetime approach to their management. Some of the commonly discussed chronic diseases include diabetes, cancer, hypertension, tobacco smoking, obesity and Chronic Kidney Disease (WHO, 2005).

In 2014, the World Health Organisation released statistics on the mortality rates of the various diseases in South Africa. The results show that, amongst others, cardiovascular diseases, cancer and diabetes are the leading causes of death in South Africa, at 18%, 7% and 6% respectively. However, notwithstanding these statistics, the impact of CKD is argued to be on the rise to the extent that in 2016, a NDoH convened national summit was to discuss the urgent need for addressing the rising implications of CKD on national health. Amongst other issues, the high costs of treatment, lack of specialised health care professionals and limited health care resources, particularly renal replacement, were viewed as highly limiting factors to the treatment of CKD. Subsequently CKD was added to South Africa's Strategic Plan for the Prevention and Control of Non-Communicable Diseases for the period of 2013–2017, and as one, which requires

immediate and feasible interventions. One of the suggested interventions in this regard was the need to improve renal dialysis treatment in the country (Meyers, 2016; Motsoaledi, 2015; WHO, 2014; Etheredge and Fabian, 2017).

In this view, whilst ICDM primarily advocates for a robust improvement in clinical and institutional processes for improved treatment of chronic conditions, one of the requirements of ICDM is for patients to travel regularly to various health care facilities for their treatments (DoH, 2014). This is consistent with renal dialysis treatment, as it requires patients to travel at least three times a week for treatment (MPH, 2017). Given that chronic conditions might take a lifetime of treatment, as defined by the WHO (2005), and that CKD is an emerging chronic condition that requires urgent attention in South Africa, also requiring regular travel to obtain treatment, the provision of effective and efficient non-emergency patient transportation services remains pertinent in accessing renal treatment in South Africa.

1.3 The Significance of the Research Study

The research study aims to contribute to the broader transportation planning, academic research, and to complement the refinement of health care system transformation policy in South Africa at a policy and operational level.

1.4 Aims and Objectives of the Research Study

The primary objective of this research was to complement existing health care system transformation initiatives in South Africa. In realising this goal, the following objectives were adopted:

1. Providing literature review that demonstrates an understanding of:
 - i. the broader issues that are related to accessibility to health care, and
 - ii. the relationship between access to health care factors and non-emergency patient transportation.
2. Identifying non-emergency patient travel needs through understanding patient travel phenomena and their implications on accessibility to health care for renal patients at MPH.
3. Determining the extent to which non-emergency patient transportation services have been met within the context of South Africa
4. Identifying areas of potential interventions from an operational and policy perspective.

1.5 Research Questions

The research study attempts to answer the following questions:

1. What are the transportation needs of patients undergoing repeated treatment for chronic conditions?
2. To what extent have those needs been met in the study context?
3. What interventions could be put in place to fully address this need?

1.6 The Scope of the Research Study

The research study was case-based, disease-oriented empirical investigation. Mafikeng Provincial Hospital was chosen for its geographical proximity to the researcher, and because it is a public hospital providing renal treatment particularly to the poor and transportation-disadvantaged group of people. A pragmatic, mixed-methods research design was used. In this regard, a sequential, explanatory mixed-methods approach was used for research analysis. Secondary data was mainly obtained from journals, published books, white papers and annual reports. A cross-sectional survey of the case study was used for primary data collection for both qualitative and quantitative research analysis. Semi-structured interviews were used for data collection for qualitative analysis while open-ended, self-completed questionnaires were used for data collection for quantitative research analysis. For qualitative research analysis, selected respondents were limited to renal dialysis patients, mini-bus taxi operators (drivers), MPH CEO, MPH Transport Manager and Head of the Renal Unit at MPH. Grounded theory was used for qualitative research analysis in response to Research Question 1. Descriptive statistical analysis and Importance Performance Analysis approaches were used for quantitative research analysis in response to Research Questions 2 & 3 respectively. SPSSx was used to produce the mean, median and standard deviation results for quantitative research analysis. The research analysis was conducted over a period of eight months.

1.7 Ethical Considerations

As the research study involves people in a medical institution and discusses real socio-economic matters (Mafame, 2017), obtaining ethical approval was necessary. The research proposal was submitted to the Faculty of Engineering and the Built Environment at University of Cape Town, University of Cape Town Research Ethics Committee, South African National Department of Health Research Ethics Committee, North West Department of Health, and Mafikeng Provincial Hospital for ethical approval (see Annexure A, B, C and D). Furthermore, the researcher ensured that potential respondents understood the research intent, and that participation was voluntary,

anonymous and confidential. Issues that required clarity were attended to prior to data collection or any interaction that was directly related to the research study.

1.8 Structure of the Dissertation

The research study is divided into six chapters as follows:

1. Chapter 1: Presents the introduction to the research study
2. Chapter 2: Presents a review of literature
3. Chapter 3: Expands the research design and methodologies
4. Chapter 4: Presents the main research findings, data analysis and interpretation
5. Chapter 5: Presents conclusions and recommendations
6. Chapter 6: Lists the references that were used in this research study

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review presents a synthesis of the existing body of knowledge on transportation and health care. Emphasis is on understanding the meaning and essence of accessibility to health care agenda and how non-emergency patient transportation fits into this narrative. The literature review also identifies initiatives that are aimed at improving provision of non-emergency patient transportation services internationally, and the efforts that South Africa has taken in attempts to address these needs. In this regard, the review includes readings from international research studies and from South Africa. While the review strives to focus on the body of knowledge that was published within the last five years, it also, where necessary, makes reference to any other literature publications that are considered to provide salient arguments that goes beyond the five-year period.

2.2 The global agenda for improved access to health care

Within the context of this research study, it is important to understand the global agenda for improved access to health care. This provides the background to the principal driving factors and the reasons for its importance. In this regard, existing literature shows that the health care system transformation agenda has a long history that spans over a century for countries such as USA, Canada, Australia, the Russian Federation and Britain among others. The main objective being the need to address inequalities in health care delivery, particularly for the poor. This reflects that improving accessibility to health care has been regarded as an important developmental factor to be striven for (Government of Australia, 2014, NHS, 2006, Marchildon 2013, Popovich et al 2011, Rice et al 2014).

Although South Africa appears to have a much shorter published history on health care system transformation as compared to the identified countries, the need to address structural and social inequalities after 1994 has been regarded as the main driving agenda for improved access to health care (Meyers, 2015, Sibiyana and Gwele 2013, Sibiyana, 2013). Throughout this history, various health care system transformation frameworks have been put in place. However, it would appear that achieving improved access to health has been a continual process, as these countries are in constant effort to improve accessibility to health care, as reflected in their repeated review of their national health policies and for South Africa, through the introduction and adoption of the National Health Insurance Policy in 2017.

Nonetheless, one of the arguments raised in some literature studies as the main driving factor for continued need to reform health system worldwide is that, historical and contemporary health system transformation initiatives have continually been failing to comprehensively integrate the various fundamental factors necessary to achieve universal access to health care (Frenk et al 2012 and 2007; Benatar 2013). In this regard, one is then compelled to ask:

1. What is the importance of health that compelled nations and societies to remain steadfast in their attempts to improve accessibility to health through continued efforts to health system transformation?
2. What are the theoretical frameworks involved in the discourse of accessibility to health?
3. What approaches have been adopted?
4. And, most importantly, what is health?

2.3 The importance of health

“Health is not everything in life, but without health, life is nothing.”
(proverb cited in Frimpong, 2014)

In interpretation of the above proverb, Frimpong (2014) highlights that accessibility to health care is important for the social and economic development of any nation, society or community, and he further highlighted that the benefits that are realised from these social and economic developments must ensure improved accessibility to health care.

2.4 Theoretical approaches to the transformation of health care systems

In support of the importance of health assertion, three theoretical concepts were reviewed, with the aim of bringing into perspective an understanding of the relevant diverging and converging theoretical principles that drive the agenda for health system transformation and improved access to health care. The major theoretical approaches to health system transformation discussed within the context of this literature review include the market-based approach, social justice theory and the rights-based approach. These appears to be the commonly discussed theoretical concepts in the discourse of accessibility to health care.

2.4.1 The market-based approach

The market-based theory asserts the importance of market economics on the improvement of access to health care. This theory asserts that health care service delivery is an opportunity to obtain health care services and is therefore an economic good that must be paid for. In this regard, treating health care as an economic good creates the necessary competition that is

required to improve the quality of health care through improved investment in health care and, subsequently, improved accessibility to health care (Burgerman et al, 2016; Stream and Meyers, 2010).

2.4.2 The social justice theory

The social justice theory asserts the guarantee of the freedom of individuals and promotes equality of the opportunity to access to health care. In this regard, provision of health care should be explored within the capacity and the prevailing social and economic dynamics of the state. In other words, the social justice theory asserts that the state should provide health care services based on the need to alleviate inequalities in health care service delivery to achieve better social and economic development (Bodenheimer 2005, Freeman 2003 and Daniels 2013).

2.4.3 The rights-based approach

The rights-based approach asserts that everyone has the right to life, as accorded in the United Nations Humans Rights Charter of 1947. Given that access to health is an important factor to protect and maintain life, provision of health care should be viewed as a human right (WHO, 2008). Notwithstanding the contributions of the market-based approach and the social justice theory, countries across the globe appear to have integrated these theoretical approaches in their health delivery system to provide diverse health care models (Bismarck, undated). However, in the view that health care is considered, as an important factor for the social and economic development of nations worldwide, the majority of the countries global-wide appeared to have adopted the rights-based approach in their health system transformation initiatives, including South Africa.

2.5 Health as a human right

In 1947 access to health was declared a human right by the UN General Assembly. In South Africa, the Constitution's Section (27) of the Bill of Rights declares that access to health is a human right that the state has an obligation to provide. Although these rights might be limited to a rational cause as highlighted in Section (36) of the South African Constitution, these declarations appear to be the main drivers of the health care system transformation agenda in South Africa. The major thrust of these rights-based approaches seeks to address the inequalities, discriminatory practices and unjust power relations, which are often at the heart of development problems (WHO 2008; UN, 1978; Constitution of South Africa, 1996). In this regard, various

approaches, health programmes and legal frameworks were drawn up and implemented in an attempt to improve access to health internationally and for South Africa in particular.

2.6 Health system transformation in South Africa

In efforts to honour the declaration on health as human right, the United Nations introduced various broad-based developmental programmes over the years. More relevant to this research are the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), which were introduced in 2001 and 2013 respectively. While MDGs focused on reducing child mortality rates, improving maternal health, combating HIV/AIDS and malaria (WHO, 2001), the SDGs that succeeded the MDGs, prescribed a broader goal to health, which is to ensure healthy lives and promote well-being (WHO, 2010; UNDP, 2015).

Under the guidance of the World Health Organisation (WHO), the broader objectives of both the MDGs and SDGs were refined into more focused health system transformation programmes. The programmes include health system strengthening and performance measurements that emphasised the revitalisation of health financing, services delivery, medical products, technologies and leadership/governance and human resources. These aspects formed the six building blocks towards improved access to health (WHO, 2008). The implementation of these building blocks as measured by the sequels on health system performance measurements was criticised by some literature studies, including Swanson et al (2012) as reductionist approaches that resulted in increased investment in selected interventions that subsequently failed to address the diverse access to health factors of present ills and to prepare health systems for the future. However, among the various health system strengthening initiatives, the most relevant health system transformation programme is the re-emphasising of the implementation of a Primary Health Care programme. This approach is widely regarded as having the potential to improve accessibility to health care through improved health coverage and preventative approaches (WHO, 2008).

2.7 Primary health care approach

The concept of PHC was introduced in 1947 by the United Nations General Assembly. Fundamentally it is seeking community-oriented health care that is driven by a preventative approach to disease management and improving health education. PHC also seeks to link primary health facilities to communities and tertiary facilities as a way of improving health coverage and access to health care (WHO, 2008).

In South Africa, the PHC approach was re-asserted in the post-1994 period to address the existing prevalent inequalities in health care systems (Sibiya, 2013, Sibiya and Gwele 2013). Some of the approaches to PHC re-engineering in South Africa include free health care services to all public clinics at the point of delivery, the school health care programme, the decentralisation of the health systems into district health systems and revitalisation of public health facilities (Kautzky and Tollman, undated, NDoH 2016). While the re-assertion of PHC appears to have resulted in the improvement of access to health as measured by the increased number of visits to health care facilities (NHI, 2015), Sibiya (2013) argues that very little or nothing has been done to investigate the meaning of PHC in relation to the diverse social and economic dynamics such as poverty and health care resource scarcity that are viewed as major challenges to improved access to health care. In this regard, this has hindered the efficacy of PHC re-engineering and the alleviation of the challenges of the burden of diseases in South Africa (Ruff et al, 2011 cited in Sibiya, 2013, NDoH, 2014).

On a global level, the WHO argues that the reluctance of nations and the perverse actions of profit-driven private pharmaceutical conglomerations have hindered the effective implementation of PHC (WHO, 2008). These fundamental weaknesses of PHC and the health system strengthening initiatives appear to have given impetus to the acceleration of health policy reform in South Africa and other international countries such as USA, Australia, Britain, India and Turkey. In this regard, South Africa have adopted and put in place various legal and policy frameworks that are aimed at addressing the weakness of PHC and the broader health system transformation initiatives in attempts to achieve universal access to health care.

2.8 Main legal frameworks for health reform policy in South Africa

The National Health Plan for South Africa was introduced in 1994 and became precursor to the subsequent legal and policy framework for health system transformation (NDoH, 2016). Of main relevance to this research study are: The National Constitution of South Africa of 1996, The White Paper on Health Systems Transformation of 1997, The National Health Act of 2003, The White Paper on National Health Insurance Policy of 2015, and the National Development Plan 2030. These legal and policy frameworks drive the agenda for health system transformation in the country. However, without providing details of each of these legal and policy frameworks, most relevant to this research study is the introduction of the NHI policy in 2015 as it seeks to achieve universal access to health care in the country.

2.9 NHI Policy in South Africa

Similar to countries such as USA, Britain, India, Canada and Australia, South Africa introduced the White Paper on National Health Insurance Policy in 2015 and it was approved by the cabinet in 2017. The main aim of NHI policy in South Africa and other similar countries that have adopted NHI policies is to provide a more refined framework in an attempt to improve access to health and to achieve universal access to health (NHI, 2015). In this regard and for South Africa in particular, the ten objectives of the NHI policy cover access to health factors that include *universal health coverage, quality of health services, equity and social solidarity, and centralised and equitable health financing system*. Furthermore, the objective recognises health as a public good and social investment that will require strengthening, innovation in health care service delivery that ensures the continuity and portability of health services. In other words, the NHI policy in South Africa simply asserts the need for robust health reform that provides the opportunity to achieve universal access to health care and reassert health as a human right.

2.10 Universal access to health

According to the NHS (2006), universal access to health care can simply be defined as the availability to and utilisation of health care services by all individuals or group of individuals without undue barriers. Although the fundamental objective of NHI policies remains improving accessibility to health care, the universality of the various national health insurance policies has been questioned in some literature studies. For example, Gray and Wavda (2016, 2017) argues that while the introduction of the NHI policy in South Africa is expected to bring finality to address the diverse challenges related to the historical and contemporary health systems, the policy is not comprehensive in its nature as it lacks details on how some factors necessary for realisation of universal access to health should be dealt with. In support of this argument, the authors cites the urgent need to modify and to align (and the lack thereof), the already existing legal frameworks related to regulation of health delivery as an imminent challenge to the realisation of universal access to health. In the same vein, this research study finds that, while NHI recognises the importance of patient mobility in achieving universal health coverage, the policy lacks details as to how such will be achieved.

On an international level the protagonist of the social justice theory on health care delivery that includes, Basch (2014), Cameron et al (2015), Harnack (2014), Socias et al (2016) and Preda & Voigt (2015) echo similar sentiments. They argue that NHI policies are not comprehensive in their nature, as they do not explicitly address the various factors necessary to achieve universal access to health. For example, while Socias et al (2016) argue that universal access to health in

Canada is hindered by institutional barriers such as long waiting times, limited operating hours and perceived disrespect by health care providers, Harnack (2014) highlights that the efficacy of the current national health insurance policy of the USA (Medicaid) is hindered by lack of effective and efficient transportation services necessary for improved access to health.

The fundamental view of these critics of the universal access to health agenda asserts that health care needs requirements are not the same across individuals, societies, communities and nations. Therefore in order to achieve universal access to health, the critics of the universal access to health agendas as propagated by various NHI policies argue that one has to clearly understand the fundamental aspects of health that include social determinants of health and the implications of barriers to accessibility health care in the whole discourse of health system transformation agenda (Daniels 2013, Lévesque et al 2016, Cameron et al 2015).

2.11 The social determinants of health

The National Department of Health of South Africa's 2016/2017 Annual Performance Report defines the social determinants of health as social and economic conditions influential to the health of the people. Regarded as a constitutional mandate, the government of South Africa has made attempts to provide basic services like free schools, social grants, housing, safe water supplies, electricity, sanitation and sewerage, and free primary health care. The report also acknowledges that meeting these diverse social needs is important for the alleviation of poor health outcomes in South Africa (NDoH 2016).

Basch (2014), Cameron et al (2014), Wilkem et al (2014) and Preda and Voigt (2015) expand on the definition of the social determinants of health. The common argument contained in these literature studies is that the definition of the social determinants of health should include the circumstances in which people are born, grow up, live, work and grow old, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces that included economics, social policies, and politics, amongst others (WHO, 2014). These literature arguments recognise that access to health is not only influenced by the social and economic conditions of any given society, but rather should be viewed in a broader context that also include the influence of physical environments, cultural, social, economic and health policies, among others. These literature studies further highlight that physical and networked infrastructure provision such as social housing, sanitation, water and transportation, also form part of the broader definition of social determinants of health; and that access to health care in itself is a

determinant of health. In addition, these literature studies recognise the need to integrate the various aspects of the determinants of health, if universal access to health is to be realised.

Notwithstanding this diversified view on the determinants of health, one of the fundamental issues raised in the discourse on accessibility to health care is that, for one to understand the definition of accessibility to health care, one has to also understand the barriers to the determinant conditions of health, as these barriers result in unmet health care needs that subsequently deprive individuals or groups of individuals in realising individual or equal opportunity for all to social and economic development, which is viewed as the fundamental importance of health (MaCKinney 2014).

2.12 Access barriers to health

Barriers to access to health care refers to both the intrinsic and extrinsic factors that diminish one's ability to access health (MaCKinney 2014). The Institute of Medicine 1993 (cited in MaCKinney 2014) classified access to health barriers into *structural, financial, personal and cultural factors*. Structural barriers were defined as the limitations to access to health associated with the *quantity, type, physical, concentration and organisational configuration of providers of health*. Financial barriers are the fundamentally based on *affordability of health care services*, and personal and cultural barriers present a set of explicit or implicit rules that determine the behaviour of social subjects in relation to their health, which, amongst others, includes one's *inability to travel for health care and communicate with health providers*.

MaCKinney (2014) further highlights that governance frameworks, particularly health policies, should not only be viewed as political vehicles, but should genuinely address the health needs of people. Subsequently, if policies are not drafted and implemented to respond to factors influential to the access to health, they can become barriers to the access to health themselves. Porter et al (2013) discusses the implications of health facilities distribution within a given geographical framework, and recognises that remote geographical locations which are often characterised by long travelling distances, lack of adequate health facilities, poor transportation infrastructure, poor communication and information among other spatial and technological factors, are some of the major barriers to the access to health care in Tanzania.

Basch (2014) links the access barriers to health to the implications of poverty on accessibility to health care. The literature asserts that poverty is the most single barrier to access to health, and all the social and environmental factors of health co-vary with the degree of poverty. He

recognises that poverty can lead to poor housing, nutrition, and greater exposure to violence, less access to continued health care, and the much greater prevalence of mental and physical health problems. In his view, in order to achieve better health outcomes, public policies should concurrently address factors necessary to improve the quality of life of the people, including education, employment, and economy, physical and networked infrastructure, amongst other issues required to alleviate poverty.

While the brief discussions on the determinants of health and access barriers might not be exhaustive, the main argument raised in these literature studies is that, addressing social, technological and economic barriers should be done in a manner that ensures improving and maintenance of a better quality of life of the people. Fundamentally, these discussions frame accessibility to *health as the maintenance of individual or group of individuals' wellbeing*, which is influenced by the interaction of various social, economic, physical, environmental, education, employment, infrastructural and cultural dynamics of a society or nation, and should be the major integral frameworks in the health system transformation agenda.

2.13 Frameworks of accessibility to health care

Literature discussions, particularly on the determinants of health and implication of barriers to access to health on the maintenance of wellbeing, provide a background to the frameworks of accessibility to health care. Within the framework of these broad discussions, Levesque et al (2016) provides a summarised view of the various frameworks that attempt to define accessibility to health care. In this regard, accessibility to health care has been defined in terms of *numbers of people who obtain required services, quality of services, availability of services, the interaction of population and health resources as an entry into the health systems; as combining attributes of population and resources; as the ability of population to seek and obtain health care services; as an opportunity to utilise health care services; as function of supply and demand of health care services; as the timely use of health care services; as an opportunity to consume goods, coverage and the actual use of services, and as the relationship between populations and the medical facilities.*

Levesque et al (2016) and Daniels (2013) recognise that these varying definitions of accessibility to health care reflect that accessibility to health care is not a universally agreed discourse. In a synthesis of these arguments and diverse definitions on accessibility to health care, the critique on the discourse on universal access to health and discussions on the determinants of health, the most relevant definition of accessibility to health care is the one outlined by Levesque et al (2013)

and MaCKinney et al (2104), who highlighted accessibility to health care as *the interaction of the various factors of access to health that enables an individual or group of individuals to utilise health care services with the objective of maintaining wellbeing*. However, also relevant to this research study, particularly in support of the argument raised in the introduction of this chapter, are the implications of the spatial dimensions of accessibility to health care, for which patient mobility is one of the fundamental factors of access to health care (Luis and Cabral, 2016).

2.14 Spatial accessibility to health care services

Spatial accessibility to health care is regarded as a function of health geography. It is generally defined as the availability of health care services within a predefined area. The main attributes of spatial accessibility include the relationship between health supply and demand, diversity of health care services and the distribution of health services across geographical spans (Brondeel et al 2014; HAPI 2014, Yeramilli and Fonseca 2014).

Apart from the contributions of effective health supply and demand factors; and the diversity of health care services on the discourse of spatial accessibility to health care, one of the most relevant attribute of spatial accessibility dimensions relevant to this research study is the distribution of health care services across the geographical spans. In this regard, Brondeel et al (2014) highlights that proximity and availability of health care services are important to gain access to these services. In support of this view, a study by Luis and Cabral (2016) on geographic accessibility to primary health care centres in Mozambique, finds that access to health care is negatively affected by poor coverage and distribution of health facilities, for which provision of effective and efficient patient mobility was argued to be an important access factor to mitigate this access to health care problem. The study also concludes that the lack of effective and efficient transportation services worsened this access to health challenge, and further highlights that improved mobility services is a key access factor particularly in geographical areas with prevalent health resource scarcity.

Similar sentiments were asserted by Ursulica (2016) who further highlighted that that the various mobility factors that includes, lack of availability of transportation services and poor transportation infrastructure were the main barriers to access to health despite the availability of health care service in Bostan County, Romania, while Wilkem et al (2005) highlights that lack of access to mobility services has diverse implications on the health profiles on societies, nations, communities, individuals or group of individuals.

2.15 The implications of non-emergency patient travel on access to health care

Apart from connecting communities to physical health facilities and other social and economic amenities, provision of efficient and effective transportation, particularly non-emergency patient transportation is argued to be an important access to health factor. The lack thereof is argued to lead to negative health outcomes as briefly highlighted in the discussions on spatial accessibility to health care and the introduction chapter to this research study. The consequence of unmet transport needs can lead to a number of negative health outcomes, including missed appointments, loss of health care services for patients, treatment drop-out and inability of people to obtain prescription for medication. However, the worst outcomes of such eventualities are increased morbidity and mortality rates and these effects are found to be severe on the transportation disadvantaged group of people that includes, the poor, elderly, women, children, people with disabilities and people with chronic conditions among others (Wallace et al, 2005, Wilkem, 2012, Atuyo 2014).

If access to health care is a human right as declared by the United Nations Human Rights Charter, then patient mobility, particularly for the transportation of disadvantaged persons and in view of the importance of patient mobility on access to health care, as identified through literature, it is critical that academic research, health system transformation initiatives and broader transportation planning recognises and effectively address this need.

2.16 Non-emergency patient transportation within the discourse of transportation planning and accessibility to health care

Transportation systems, particularly public transportation systems, are considered important planning tools to shape and transform urban areas into sustainable settlements and improve economic development. With regards to accessibility to health care, while the main literature arguments discussed so far fundamentally recognise that provision of effective and efficient non-emergency patient transportation services remains a critical challenge of the accessibility to the health care agenda, Mindell (2017), who is citing a number of literature studies, recognises that there has been an improved awareness of the relationship between transportation and health care. Some of the relationships under increased scrutiny include the relationship between health and transport-induced pollution, obesity, injury, disease control, climate change, fitness, and access to health care. This view is also supported by the perceived increase in publications over the past two decades that are related to the discourse, including the Transportation Research Board (TRB) publications 99 (2011) and 109 (2014), and the Access Exchange International sequels on accessible transportation systems. These literature studies do not only reflect on the need to

improved non-emergency patient transportation services, but they also provide significant insights into innovative non-emergency patient transportation design interventions on a global scale.

On global level, this improved awareness of the importance of non-emergency patient transportation services appears to have also received increased recognition at a health care system transformation agenda. In this regard, a number of countries, including Britain, Canada, the USA and Australia have attempted to provide effective and efficient non-emergency patient transportation services and have covered this need through various policy options in their national health insurance programmes. Britain's NHS (2006) directly prescribes the need for collaboration among health-care practitioners, engineers, urban designers, architects and other building professionals in providing interventions for the provision of non-emergency patient transportation in the country. In the case of Australia, a Non-emergency Transportation Act of 2003 was put in place to provide legal guidance for operational and quality assurance requirements for non-emergency patient transportation services, while the USA has historically made provision for non-emergency transportation services in their broader health insurance programmes through Medicare and Medicaid. In addition, efforts are underway in the USA to see how the introduction of the Affordable Care Act of 2010 can provide opportunities for the improvement of the provision of non-emergency patient transportation services (Smith 2013).

Whereas the discourse on integrating transportation planning appears to have gathered significant momentum in the countries highlighted above, the situation appears not to be the same in the case of South Africa. It would appear that this need has not been adequately addressed in respect of academic research, broader transportation planning and health care system transformation initiatives. For example, while there are some studies related to non-emergency patient transportation (Mashiri et al, 2008; Corcoran et al, 2012; Gaedei and Versteegi, 2011; and Rosen et al, 2007) these studies remain focused on recognising the importance of non-emergency transportation services on improving access to health care without outlining innovative interventions that seek to address the diverse needs necessary to improve accessibility to health care and the maintenance of wellbeing. On the other hand, while provision of planned transportation services on a provincial level as in the case of the North West Province, and attempts to provision of accessible transportation services in cities such as Cape Town, Nelson Mandela Bay and Tshwane (Access Exchange International, 2009, Government of South Africa 2014) are regarded as noble attempts, they remain territorially bound and their benefits may not necessarily be realised on a national scale with the same standards. For example, the

types of vehicles and schedule of services may vary across the provincial boundaries, which may possibly negatively affect a certain group of patients or individuals. In addition, South Africa does not have legal acts that guide the operations of such services in order to ensure quality standards and the safety of the users. Such situations may reduce the essence of universal access objectives in the country.

On the level of broader transportation planning, the importance of transportation in South Africa is acknowledged by broader planning policies such as the National Development Plan 2030, published in 2011, the Draft Spatial Development Framework of South Africa of 2011, the Green Transport Strategy of 2018, NATMAP 2050 and the National Spatial Development Framework of 2018. These policy frameworks assert the importance of improved transportation services, particularly public transportation services, in transforming the perceived unsustainable urban systems and improved economic developments through improved mobility connectivity across geographical spans. However, given that the HRC (2007) and the Health Audit Report of 2011 (NDoH, 2011) acknowledge the lack of transportation services as a critical barrier to access to health care in the country, it reflects that provision of effective and efficient non-emergency patient transportation services remains a critical challenge in achieving universal access to health care in the country. Nonetheless, as highlighted in the introduction of this research study, South Africa's NHI provides the opportunity to address this need, but one has to understand the salient attributes of non-emergency patient transportation services if this need is to be sufficiently addressed.

2.17 Attributes of non-emergency patient transportation services

Understanding the attributes of non-emergency patient transportation service is important for planning interventions that are aimed at improving access to health care, especially as the literature discussions so far highlight that lack of non-emergency patient transportation services is found to be a barrier to access to health care with diverse implications on the wellbeing of individuals.

Sagrestano et al (2014) aggregated non-emergency patient travel attributes into availability, accessibility, accommodation, affordability and acceptability. Throughout literature studies, these attributes can either positively influence accessibility to health care, or can be barriers to access to health care services. Their influence were discussed in detail below.

1. **Availability of non-emergency transportation services:** Availability relates to the presence or absence of transportation within a geographical area at any given time. In this regard, issues such as the adequacy of transportation services and travelling times should be taken into account in the planning of non-emergency transportation services. Porter et al (2013) recognises that remote geographical areas are often associated with limited transportation. However, availability of transportation services can also be influenced by other travel factors such as affordability; longer waiting times, the condition of transportation infrastructure, such as roads, and longer travel times (Ursilica, 2016).
2. **Accessibility of non-emergency patient transportation services:** Accessibility is described as the ability for one to obtain transportation despite service availability. In this regard, spatial factors such as long walking distances to obtain transportations services and poor communication and information systems are regarded as some of the main factors that have an influence on accessibility to transportation services. In other words, transportation services have to be easily accessible on a spatial level (Luis & Cabral, 2016, Del-Peterson et al 2014, Porter el at 2013).
3. **Accommodation of non-emergency transportation services:** Appropriateness of the transportation was defined as the security and the fitness of the vehicle in relation to the medical or physical condition of an individual or a group of individuals. Non-emergency patient transportation services should not expose patients to the risk of worsening medical conditions and safety risks. Wilkem et al (2005), recognise and argue that people with chronic conditions, children, women, the elderly and the disabled more often face diverse challenges to access to non-emergency patient transportation services, as they are regarded to be transportation disadvantaged. The literature further argues that non-emergency patient transportation services should provide the type of vehicles that are appropriate to meet these diverse personal health challenges.
4. **Affordability:** Affordability refers to the ability for one to meet travelling costs without any problem. Rosen et al (2007) and Segrastano et al (2014) highlight in their respective studies that expensive transportation is one of the barriers to access to health care services for HIV people. Therefore, non-emergency transportation services have to be affordable in order to improve accessibility to health care.
5. **Acceptability of non-emergency transportation services:** Acceptability denotes transportation providers' procedures and attitudes towards clients. Some of the issues that relate to the acceptability of transportation services include ensuring privacy, good courtesy and attitudes of service providers (Segrastano et al, 2014).

In addition to the above-identified attributes, Ursulica (2016) highlights that non-emergency transportations services should be *efficient*. In this regard, the provision of transportation services should be able to manage the implications of longer waiting times, longer travel distances and longer travel times. He further highlighted dependability and readability of non-emergency transportation services as some of the attributes of efficient transportation services. Generally inefficient non-emergency patient transportation services are argued to cause delays and can be a barrier to the access to health care services. Litman (2017), on the other hand, highlights provision of *easily connected* transportation services as one of the dimensions of accessibility and efficient transportation services. NHIB, 2005; Martin 2013; NHS 2006, further recognise comfort, and provision of adequate and appropriate universal access to infrastructure and facilities of conveniences (e.g. toilets, waiting rooms and sleeping areas) as some of the attributes of efficient and effective non-emergency transportation services.

While the common view among literature studies is that non-emergency transportation services should be responsive to the diverse needs of their clients, it becomes imperative to highlight the major barriers of access to non-emergency patient transportation services, as they also provide a background to the development and implementation of innovative approaches to provision of effective and efficient transportation services.

2.18 Approaches to the provision of non-emergency patient transportation services

One of the objectives of the literature review is to identify how other countries have addressed the diverse attributes of non-emergency transportation services. This is important, because it gives the researcher an overview of the gaps that might need to be discussed within the context of the research findings and the subsequent conclusions and recommendations. Without going into detailed discussions, some of the approaches identified through studies that include Access Exchange International 2012, 2011, 2010; Del-Peterson 2014; NHS 2006; Health Canada, 2005; Smith, 2013; McGehee, 2014; Burkhadr et al, 2011) and the broader non-emergency patient transportation initiatives in Australia, are summarised as follows:

1. *Inclusion of the provision of non-emergency patient transportation agenda in the mainstream health systems' transformation planning policy:* This is viewed as an important stepping stone, as it accelerates the transformation for the provision of non-emergency patient transportation services at a policy level.

2. *Conducting public consultations:* This is argued to provide the opportunity to comprehensively identify the diverse non-emergency transportation design requirements.
3. *Collaborative planning:* Collaborative planning asserts bringing the various professionals in health care, policy planning and the built environment into the planning, design and implantation of non-emergency patient transportation services. The objective is to integrate the various policy and operational transportation requirements in the design of non-emergency patient transportation services.
4. Provision of centralist funding for non-emergency patient transportation services aimed at reducing the impact of transportation costs on accessibility to non-emergency patient transportation services.
5. Development of a specific non-emergency patient transport programme legislative framework that guides and regulates the structural and operational requirements of the programme and protects parties involved within the programme to reduce safety, infection and worsening medical conditions.
6. *Provision of multimodal non-emergency transportation services:* Provision of multimodal non-emergency transportation services is aimed at providing the diverse non-emergency transportation services to meet the diverse medical conditions of patients.
7. *Contracting various transportation agencies:* Contracting multi-transportation agencies is viewed as improving service provision by allowing the patients a wider choice of non-emergency transportation services and improve transportation services capacity.
8. *Use of modern technologies:* The use of modern technologies like UBER and the internet is viewed as giving the opportunity to improved access to transportation services through forward planning approaches like scheduling appointments. Over and above, online information data sources reveals that modern technologies like Drones are used for transportation of medicines through remote controls while, smart phones and clocks are equipped with software's and hardware that have the ability to provide health related information on the environment and further alert individuals on their medical implications.
9. *Provision of community-based information centres to improve access to information that is related to access to non-emergency transportation services and health care services.*

While the above approaches are fundamental to policy reform, they do not necessarily transform technical designs of the actual transport and infrastructure designs for transport systems (Burkhardt et al, 2011; Peterson, 2014), and they also remain context based and might not necessarily be transferred to the South African context.

2.19 Summary of discussions

Major literature findings can be summarised as follows:

1. Access to health is an important factor for the social and economic development of societies, communities and nations, and because of this, there have been continued efforts globally to improve accessibility to health through various health system reviews.
2. The declaration of access to health care as a human right is the major driving factor for the health transformation agenda in South Africa and worldwide.
3. Health system transformation initiatives should recognise and integrate the various factors that influence the quality of life if universal access to health is to be achieved.
4. Health is defined as the maintenance of individual wellbeing, which requires addressing and integrating the various factors that influence individual wellbeing or a group of individuals' well-being, especially addressing the socio-economic inequalities that are characteristic of the historical and present health system; and thus accessibility to health care is described as *the interaction of the various factors of access to health that enables an individual or group of individuals to utilise health care services with the objective of maintaining wellbeing*
5. Non-emergency patient mobility is important to maximise access to health care, and is generally regarded as a barrier to the accessibility of health care, especially for the poor, children, older people and people with chronic conditions.
6. The provision of effective and efficient transportation services has a spatial dimension that has not been adequately addressed in South Africa's academic research, transportation planning and health care system transformation initiatives. In this regard, the National Health Insurance Policy of South Africa provides the opportunity to address this need as one of the interventions required to achieve universal access to health in the country.

CHAPTER 3: RESEARCH DESIGN

3.1 Introduction

The research study was conducted to identify the non-emergency patient transportation needs for renal dialysis patients at Mafikeng Provincial Hospital, and to show how these needs effect their ability to access transportation and health care services, which makes it a case based empirical investigation. The research study also attempts to identify interventions that can be implemented to improve access to non-emergency transportation services and to improve accessibility to renal dialysis treatment, which makes this research an applied and pragmatic research. Given the structure of the research questions, a sequential, explanatory mixed-methods approach was used. Semi-structured interviews were used for data collection for qualitative research analysis, while the Likert scale was used to measure altitudinal values of the open-ended research questionnaire for quantitative research analysis. In view of the fact that the research seeks to understand patient travel phenomena and its influence on accessibility to health care, grounded theory was used for qualitative research analysis in response to Research Question 1. Descriptive statistical analysis was used to determine the extent to which the identified travel needs were met within the context of the case study, while IPA was used to identify areas of intervention.

In brief, Chapter 3 outlines the detailed methods of data collection, analysis and interpretation. The chapter expands on research design approach, data collection methods, development and application of research instruments, data analysis, interpretation methods, research ethics, research limitations, the structure of research findings and data analysis and interaction.

3.1.1 Research design approach

Individuals preparing a research proposal or plan should make explicit the larger philosophical ideas they espouse, as the information will explain why they choose particular research strategies (Creswell, 2009). In view of the research questions, aims, objectives and literature discussions, this research study adopts a social constructivist, post positivist and advocacy philosophical overview.

The research study is an empirical method of inquiry, as it seeks to address a subject that is viewed to have been inadequately addressed through case study based approach. The research study adopts the social constructivism approach as it attempts to understand the implications of patients travel at MPH on accessibility to renal dialysis treatment (Martin, 2017). Adoption of

the post-positivist and advocative approach is primarily based on literature conclusions which argue that there are some efforts in the provision of non-emergency patient transportation in South Africa. However, such efforts remain inadequately addressed in literature studies and practices, and require to be assessed, with subsequent findings used to interpret the relationship between causes and outcomes, and provide further insights into the potential interventions. The research study is also advocative, as it aims to complement South Africa's NHI policy efforts in improving accessibility to health care (Cresswell, 2009). Given the structure of the research questions, the research study is plural and pragmatic in design. Pluralism demands pragmatism to research analysis, as it allows the interfacing of various ideas, theories and research findings to explain the prevailing phenomena in answering research questions (Bean, 2005, Kumar, 2011).

3.1.2 Sequential, explanatory, mixed methods approach

Adopting the mixed methods approach was aimed at improving both internal and external data validity and optimisation of research outcomes in answering research questions. In a sequential manner, qualitative and quantitative research analysis were applied to respond to Research Questions 1 and 2 respectively, using the explanatory research approach. Subsequently, findings from qualitative research analysis (Stage 1) were used to develop research instruments' questions for quantitative research analysis (Stage 2). Research findings from both stages of the research analysis were synthesised to establish the relationship between patient travel and accessibility to health care. They were also used to develop conclusions and recommendations in synthesis with literature discussions. The use of various research data collection and analysis methods that include triangulation, grounded theory, descriptive statistical analysis and IPA to explain patient travel phenomena and identify areas of interventions reflects the pragmatic nature of the research (Subedi 2016, Schoonenboom and Johnson 2017).

3.2.3 The case study approach

Although case study approaches are viewed as time consuming, demanding, and can be biased because of the researcher's constant interaction with the research participants (Bryman, 2008, Bryman and Bell, 2014 cited in Mafame, 2017), the use of the case study research approach allowed investigations on existing phenomena within a real-time contextual setting to provide explanations and practical solutions to an existing problem. Similar research studies that include Cao and Cao (2017) and Casas et al (2017) previously applied a similar approach. Nonetheless,

MPH was chosen for its geographical proximity to the researcher, and that it is a public provincial hospital where the poor are likely to be treated (Meyers, 2015).

3.2.4 Triangulation research approach

One the advantages of using pragmatic approaches to research studies is that the researcher can employ various strategies to enhance the quality of the research and data validity by the elimination of bias through constant cross-verification of data consistency (Sebedi, 2016; Ghrayeb et al 2011; Mafame, 2017). As a method of improving data validity, triangulation was used in qualitative analysis research sample selection and analysis of research findings through the methodological, theoretical and data analysis triangulation process. Through stratification, three categories of respondents, that includes renal dialysis patients, treating doctors and transportation operator were selected to provide accounts of their patients travel experience for primary data collection. Furthermore, for each category of selected sample at a patient level, three respondents were selected for semi-structured interview. At a data analysis level, grounded theory, descriptive statistical analysis and IPA were used in attempts to respond to the research questions. Marti and Sanchez (2017) applied a similar approach in their study on improving transportation networks.

3.3 Data collection methods

Both primary and secondary data were collected for the research analysis. Primary data collection involved conducting cross-sectional surveys for both qualitative and quantitative research analysis, using semi-structured interviews and structured questionnaires respectively. Desktop literature studies was used for secondary data collection. The main sources of data include journals, books, white papers, annual reports and, in some cases, working papers and previously published dissertations. These sources were viewed as credible sources of information.

3.3.1 Data collection procedures

Given the sequential and explanatory nature of the research study, data collection and analysis involved eight thematic steps as listed below:

1. Literature review
2. Development of research instruments for qualitative research analysis
3. Primary data collection for qualitative analysis
4. Qualitative data analysis and research findings presentation

5. Development of research instruments for data collection for quantitative research analysis
6. Primary data collection for quantitative analysis
7. Quantitative data analysis presentation of research findings
8. Report writing

While the data collection process reflects the structured sequential process, practically the whole research process was cyclical and interrelated at some stages in attempts to explain some of the research outcomes.

3.3.2 Research instruments design for primary data collection

Given the structure of the research questions, aims and objectives of the research study, open-ended semi-structure interviews and structured questionnaires were used for primary data collection for qualitative and quantitative research analysis respectively. The design of the research instruments is discussed in detail below.

3.3.3 Semi-structured open-ended interviews

Semi-structured open-ended interviews allow the respondents to freely express their views while providing guidance to both the researcher and the respondent throughout the interview discussions. They also provide a flexible platform for both the researcher and the respondents to pose follow-up questions. This enhances the depth of data collection, while maintaining the control required to limit discussions to relevant matters (Gubrium & Holstein, 2002; cited in Mafame, 2017; Kumar 2011). While open-ended semi-structured interviews are criticized as time consuming and in some cases they even open up space for participants to manipulate their opinions (Lewis Beck, 2004; Warren, 2004; Rosaline, 2008, cited in Mafame, 2017), the use of the phrase “*today*” was emphasized in the design of the semi-structured questions in attempts to mitigate this possible limitation and also to solicit recent information from the respondents. This is viewed to be important for improving the credibility of data collected.

3.3.4 Structured questionnaires

Structured questionnaires are viewed to be time saving and easy to administer (Kumar, 2011). Both open-ended and closed questions were used in this research study in the design of the structured questionnaire. In statements where attitudinal values had to be measured, open-ended questions were used to avoid limiting respondents to particular answers. Closed-ended questions were used where the researcher intended to determine the absolute level of extent to a particular

element developed from the literature and the qualitative research findings to support arguments that might arise through the research analysis process.

To enhance attitudinal perceptions among the respondents, open-ended statements were qualified through use of various phrases like “*easily*”, “*without problems*” and “*readily*” to the measurement of level agreement to the research statement. For the purpose of easy reference of research statements by the respondents, the structure of the research questionnaire combined both measurements of level of agreement and level of importance. The questionnaire design also allowed for collection of demographic information of the respondents, which is viewed as important contextual information for the research analysis.

In measuring the attitudinal values of the level of agreement and level importance of research statements, a five-point Likert scale was used, primarily for the ease with which the respondents would answer the research questions, and also the researcher would process, analyse and interpret data. Values from the Likert scale are also argued to be more objective than other attitudinal measurement methods like Thurston and Guttman scales. For example, in the cases of the Thurston method, the major criticism is that judges and respondents may assess the importance of a particular statement differently, therefore the respondents’ attitudes might not be reflected (Kumar (2011)). A 5-point Likert was chosen over the 3-point and 7-point Likert primarily because it was viewed as easier to manage at the level of the respondents over the 7-point Likert, meanwhile providing a better opportunity to enhance the depth of expression of attitudinal expression over the 3-point Likert scale.

3.3.5 Respondents sample selection for qualitative analysis

Selective, purposive and stratified sample strategies (Kumar, 2011) were applied for the qualitative analysis and the quantitative research analysis sample selection process. Whereas the primary consideration in purposive sampling is your judgement as to whom can provide the best information to achieve the objectives of your study (Kumar, 2011), stratification is applied to represent specific characteristics of individuals (Creswell, 2014).

Renal dialysis patients, hospital management and transportation operators were the three main selected categories of respondents, purposively representing the health care user, access an enabling service provider and health care provider. The sample design for renal dialysis patients was stratified into age, gender and travel distance, as these are some of the important non-

emergency patient transportation attributes identified in the literature (Wallace, et al 2005). These stratified attributes were used as variables for research instruments design for both qualitative and quantitative analysis. While a purposive sampling was approach applied to the selection of these three categories, stratification was limited to the category of respondents. Using triangulation procedure, three respondents were selected for each respondent category and for the stratified selected categories at the patient level, to produce a total of 30 interviews, as illustrated in Table 1.

Table 1: Qualitative research analysis sample selection design

<i>Category</i>	<i>Sample</i>	<i>No. of Interviews</i>	<i>Gender</i>	
			<i>Female</i>	<i>Male</i>
Patient Level				
Gender	Male	3	0	3
	Female	3	3	0
Age	21-30 yrs	3	3	0
	31-40 yrs	3	1	2
	>40 yrs	3	1	2
Distance travelled	0-20 km	3	2	1
	20-40 km	3	2	1
	>40 km	3	2	1
Total		24	14	10
Facility Level				
Renal Dialysis Physician (Renal Unit Head)		1	1	0
Facility Manager (Hospital Chief Executive Officer)		1	1	0
Facility Transport Manager (MPH)		1	0	1
Transportation Service Providers (Public Taxis)		3	0	3
Grand Total		30	16	14

3.3.4.1 Stratification of renal dialysis patient respondents: Category 01

In consultation with the Renal Unit Management, a total number of 24 patient respondents were selected for semi-structured interviews. Travel attributes presented in this category were limited to age, gender and distances travelled. In terms of gender, both females and males were represented in the research sample. All the respondents were above the age of 21 years of age to meet ethical requirements. In view of the fact that chronic conditions can affect anyone, irrespective of age group (WHO, 2005), 21-30 years; 31-40 years and >40 years age group categories were classified as based on the composition of the current Renal Unit Register at MPH.

MPH provides referral health care services at a sub-district level, district level and provincial level. The estimated geographical distances among the referring facilities to MPH were used to classify renal dialysis patient respondents at the level of travel distances, 0-20 km representing the group at sub-district level, 20-40 km representing the respondents at district level, while > 40 km covered the group of patients who are referred at a provincial level.

3.3.6 Mini-bus taxi transportation operators: Category 02

MPH is serviced by public buses, private taxis and mini-bus taxis. Preliminary case study discussions with the Head of the Renal Unit and the researcher's observations confirms that mini-bus taxi transportation services were the most used mode of non-emergency transportation services at MPH. Therefore three (3) mini-bus taxi operators (drivers) were randomly selected among the mini-bus taxis that operate MPH–Mafikeng CBD route as respondents for qualitative research analysis.

3.3.7 MPH Management Level: Category 03

Renal Dialysis Physician (Renal Unit Head), MPH Transport Department Manager and MPH Chief Executive Officer (CEO) were selected as respondents for the semi-structured interviews. The CEO was selected based on the executive authority that the office carries. The Head of the Renal Unit were selected based on their everyday interaction with the renal dialysis patients and as the superintendent of the unit. MPH Transport Department Manager was selected because his office has extensive knowledge on patient travel experiences at MPH.

3.4 Quantitative research analysis sample selection design

Sixty self-completed structured questionnaires were administered to renal dialysis patients in consultation with the head of the Renal Unit at MPH. The 60 respondents were conveniently selected from peritoneal and renal dialysis patients admitted at MPH. Nine (9) of the respondents were admitted for peritoneal dialysis and 51 of the respondents were admitted for renal dialysis treatment. Peritoneal dialysis patients travel to MPH only once a month for health check-ups, as they receive most of their renal treatment at home, while renal dialysis patients are required to travel three times a week to MPH for their treatment.

3.5 Data Management

Interviews were recorded using an electronic recording device. Audio records were sequentially and digitally coded (date, time and number) to avoid linking the records to the respondents and

to ensure privacy and anonymity. The interviews were stored on the electronic external hard drive for the period of the research, after which they were to be transferred to a compact disc for archiving. Self-completed questions were also number coded. The information was transformed into electronic statistical format for analysis. Completed and returned questionnaires were filed and archived in a lockable office.

3.6 Data analysis

Given the sequential and explanatory nature of the research study, data analysis was carried out in two stages. Stage 1 involved qualitative research analysis and Stage 2 involved the quantitative research analysis.

3.6.1 Qualitative data analysis approach

Qualitative data analysis can be simply described as the process of making sense from research participants' views and opinions of situations, corresponding patterns, themes categories and regular similarities to provide in-depth socio-contextual, detailed descriptions and interpretations of the research topic (Cohen et al, 2007, cited in Vosloo, 2014; Vosimaradi et al, 2015). Given that the aims and objectives of the research study require an in-depth understanding of the relationships between patient travel experiences and access to renal treatment at MPH to determine their non-emergency transportation needs, a comprehensive synthesis of multiple theoretical frameworks and practical perspectives was deemed necessary. Subsequently the research study adopts the grounded theory approach for qualitative research analysis. Raza and Kilbourn (2017) applied a similar approach in their studies published in the World Transport Policy and Practice.

3.6.2 Grounded theory

The basic principle of grounded theory involves the progressive identification and integration of categories of meaning from the data. In contrast to some of the research analysis strategies like content or thematic analysis, grounded theory is viewed as a more rigorous and flexible way of qualitative research analysis. It provides the researcher with the opportunity to modify the research study at any point of the research stage. Grounded theory provides the explanatory framework to understand the phenomena under investigation through the generation of categories that explain the interrelationships of various data collected to conceptualise the theoretical outcomes. Unlike content analysis, which qualifies pre-determined categories, grounded theory provides an unlimited framework for a holistic understanding of phenomena,

as categories are drawn from collected data. Grounded theory provides a potentially broad and integrative platform for the in-depth analysis of various data collected through the application of the various qualitative research techniques such as constant comparative analysis, theoretical sampling and theoretical coding, in order to understand key relations among certain aspects of the data (Willig, 2013, Straus and Corbin, 1990, Sibiya, 2013).

3.6.3 Data processing for qualitative research analysis

Electronically-recorded data collected from the semi-structured interviews was manually transferred into written narrations and labelled with the interview number in the data code book developed by the researcher. The data was manually edited, coded, and analysed in line with the framework provided by Kumar (2011) and Vasimoradi et al (2016) for content analysis for qualitative research inquiry. The research findings were subsequently developed and presented as descriptive phenomenology categories. Although there are various computer-based qualitative data analysis packages that include NVivo, ATLAS, LibreQDA, amongst others, the researcher preferred the manual approach for data processing and analysis. This approach was preferred by the researcher as an opportunity to closer understanding and interpretation of data through constant and close interaction with the data collected.

3.6.4 Quasi-statistical analysis

Coded themes of the data developed from the code book were manipulated into statistical manifests. They were applied where necessary to emphasize certain aspects of the research outcomes through quasi-statistical methods. Vosloo (2014) previously applied a similar approach to emphasize particular aspects of qualitative research findings and arguments.

3.7 Quantitative data analysis

Quantitative research analysis was used in answering Research Question 2 and to provide insight into responses for Research Question 3: Descriptive Statistical Analysis and Importance Performance Analysis, (IPA) for quantitative research analysis. Smith et al (2015) and Luis and Cabral (2016) previously applied a descriptive statistical analysis approach, while Cao and Cao (2017) and Putra, et al (2014) previously applied IPA in their respective transportation-related studies.

3.7.1 Descriptive statistical analysis

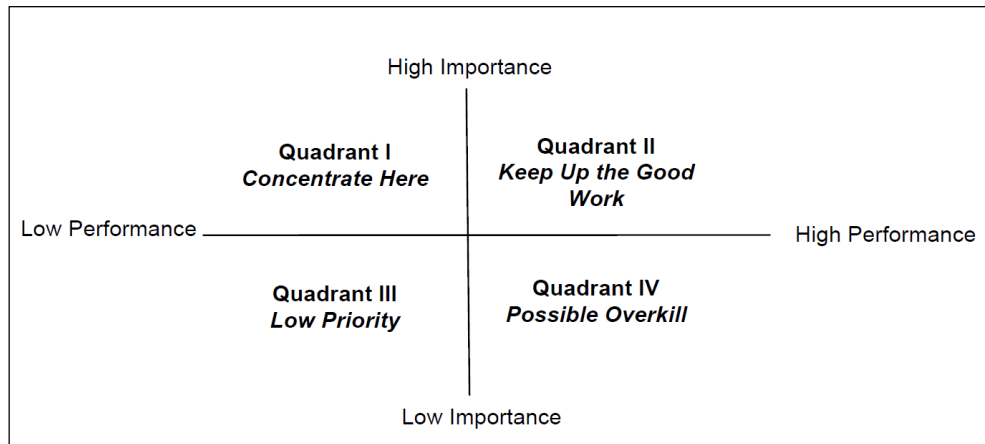
Descriptive statistical analysis describes the relationship between variables in a sample or population to provide a summary of the data in the form of mean, median and mode. The approach is considered to cover a wider range of responses than other quantitative methods, giving a broader picture of events or phenomena that describe relationships and exhibit the world, as it exists. Findings can be easily presented and can be easily understood (Baha, 2016 Ali and Bhaskar, 2016). While the pooling together of positive and negatives statistical values fails to account for the mild and strong disapprovals or approvals (Decker, 2017), one of the main advantages of descriptive analysis is its high degree of the objectivity and neutrality of the researcher (Lans & Van Der Voordt, 2002 cited in Mafame, 2017). Given the wide range of attitudinal responses from the Likert scale and the need to present the research findings in a format that is easily understood and that easily reflects the patient travel phenomena, the research study adopted a descriptive statistical analysis.

3.7.2 Importance performance analysis approach

Extant literature discusses various approaches to measuring satisfaction of quality of service (Chen and Lin, 2014; Putra et al, 2014; Carreira et al 2016; Shonhe and Mmutle, 2017) that includes, amongst others, SERVIQUAL, SERVIPERF and Importance Performance Analysis (IPA). Although it appears that SERVIQUAL and SERVIPERF have been the preferred methods among researchers and practitioners, some literature studies, including Wong et al (2011) argue that SERVIQUAL and SERVIPERF are one-sided and only measure satisfaction level and lack the importance dimension, which is critical for identifying priority areas of interventions in organisational structuring. In order to address this gap, IPA takes into consideration the importance dimension with the objective of identifying major strengths and weaknesses of key survey factors (Chen and Lin 2013). In answering Research Question 3, identification of key strength and weakness of the research outcomes is necessary and IPA was applied in this regard.

The IPA model uses a Cartesian diagram that is divided into four quadrants. The quadrants are classified into four groups, with performance on the x-axis and importance on the y-axis, as illustrated in Figure 1.

Figure 1: Original IPA Framework



Source: (Wong et al, 2011)

While the representation of IPA Cartesian quadrants might be explained differently, as in the case of Cao and Cao (2017), Putra et al (2014) and Chen and Li (2014), this research study adopts Wong et al (2011)'s original IPA framework explanation as discussed below.

1. *Quadrant I (High importance/Low performance)* is labelled *concentrate here*, where attributes that fall in this quadrant represent key areas that need to be improved with top priority.
2. *Quadrant II (High importance/High Performance)* is labelled *keep up the good work*, where attributes that fall in this quadrant are the strengths and pillars of the organisation and should be the pride of the organisation.
3. *Quadrant III (Low importance/Low performance)* is labelled *low priority*, where attributes that fall in this quadrant are not important and pose no threat to the travel journeys.
4. *Quadrant IV (Low importance/high performance)* is labelled as *Possible Overkill*. It denotes attributes that are overly emphasised by the organisations; therefore, organisations should reflect on these attributes. Instead of continuing to focus on this quadrant, they should allocate more resources to deal with attributes that reside in Quadrant I.

3.7.3 SPSSx Quantitative data processing

Statistical Packaging for Social Sciences (SPSSx) is a computer-based software that was used for quantitative data processing and analysis. SPSSx is considered one of the widely-used and versatile data-process and analysis packages that allow many different types of data analysis, transformation and forms of output (Arkkerlin 2014). However, apart from its availability to the

researcher, SPSSx was chosen over computer packages such as Excel, as the researcher is more acquainted with the package. SPSSx was used to generate percentiles, mean, mode and standard deviation values for the successfully completed structured research questionnaires.

3.8 Research limitations

The scope of this research was limited to the following:

1. A cross-sectional survey of non-emergency transportation needs for patients on repeated treatment for Chronic Kidney Disease at Mafikeng Provincial Hospital.
2. Mini-bus taxi transportation service providers who are approved to operate on the Mafikeng Provincial Hospital route.
3. The renal dialysis patients at MPH.
4. Non-emergency patient transportation systems.

3.9 Ethical considerations

Given that the setting of this research involves people in medical institutions and that the research study discusses real socio-economic matters, obtaining ethical approval was necessary. Subsequently, the research proposal was submitted to the University of Cape Town Faculty of Engineering and the Built Environment Ethics in Research, University of Cape Town Research Ethics Provisions; South African National Department of Health Research Ethics Provisions; North West Department of Health and Mafikeng Provincial Hospital for ethical approval (See Annexure A,B,C and D). The researcher further ensured that respondents understood the research intent, and indicated that participation was voluntary, anonymous and confidential. Issues that required clarity were dealt with prior to any data collection. Furthermore, accurate citation and referencing were made throughout the document.

3.10 Summary of discussions

This chapter provided a detailed description of the data collection methods and analysis used in this research study. Major points of the research design approaches are summarised below.

1. Research approach is primarily formulated from research questions, aims and objectives.
2. In view, that literature discussions highlights provision of non-emergency transportation service in South Africa as an under-researched area; the research study adopted the empirical case based on research approach.

3. Given the nature of the research questions, aims and objectives, social constructivism, post-positivism and advocacy approach were adopted as the main research design philosophies.
4. The use of the case-study approach was adopted, as it provides real-time contextual settings necessary to generate an in-depth, holistic and objective description of the renal dialysis patient travel phenomena.
5. Given the structure of the research questions, a sequential, explanatory mixed-methods approach was adopted.
6. In view of the case study approach, a selective and purposive approach was adopted for sample selection. Stratification was used for categorising and sample selection at the level of renal dialysis patients' respondents for qualitative research analysis.
7. Convenient selective approach was used for sample selection for quantitative research analysis.
8. Semi-structured, open-ended interviews were used for primary data collection for qualitative research analysis. They were chosen for their flexibility in a situation of diverse information.
9. Self-completing structured research questions were used for quantitative data collection. They were chosen for ease of administration and answering. Open-ended questions were used to avoid limited responses and provide in-depth responses to research statements. Closed-ended questions were used to solicit information that was viewed as necessary to support particular arguments in the research discussions.
10. In view of the inter-and transdisciplinary nature of the research questions, grounded theory was used to generate descriptive phenomenology categories in order to present research findings in response to research question 1.
11. Using SPSSx, descriptive statistical analysis was generated for quantitative research analysing in response to Research Question 2. To provide insights into research question 3, IPA was used to identify priority areas of interventions.

CHAPTER 4: RESEARCH FINDINGS, ANALYSIS AND INTERPRETATION

4.1 Introduction

The research study sets out to answer three researched questions as follows:

1. What are the transportation needs for patients undergoing repeated treatment for chronic diseases?
2. To what extent have the needs been met in the context of South Africa, in this case, being Mafikeng Provincial Hospital?
3. What potential interventions could be put in place to address those needs?

The structure of these research questions, together with the aims and objectives (which required explaining the correlation between patient travel experiences and accessibility to health care) guided the research design, and the structure and presentation of the findings. Section 1 of this chapter presents the phenomenological descriptive research findings for qualitative research analysis. Section 2 of this chapter presents the descriptive statistical analysis and IPA for the quantitative research analysis. Descriptive statistical analysis presents the quantitative research findings in response to Research Question 2, and the IPA presents quantitative research findings partly in response to Research Questions 2 and 3.

4.2 SECTION 1: QUALITATIVE RESEARCH FINDINGS

Annexure E presents the semi-structured questionnaire that was used for data collection for qualitative research analysis. The questionnaire is divided into five sections. The first section presents the research consent for both the researcher and the participants. The second section presents six main semi-structured questions and demographic data at a patient level. Demographic data collected at a patient level includes gender, age and the location where the respondent lives. The third section of the semi-structured interview questionnaire has one major question (with four follow-up open-ended questions) at a physician/doctor (head of renal dialysis unit) respondent level. The fourth section of the questionnaire has four open-ended questions for the hospital management respondents, and the fifth section contains three major questions for transportation service providers' respondents (which included the mini-bus taxi operators and MPH Transport Department). The questionnaire was designed to solicit optimal patients' travel experiences and how these experiences affect access to transportation services and access to renal dialysis treatment at MPH.

4.3 Background to the case study

Mafikeng Provincial Hospital (MPH) is a Level 2 public health care facility. It is located in Mafikeng town in the North West Province. MPH offers primary and referral health care services as required by the National Health Act of 2003, Regulations Relating to Categorisation of Hospital, and No. R185 of the March 2012 Health Regulations. The hospital provides 24-hour primary and referral health care services. Although the Renal Unit was expected to operate in a similar way, the unit operates from 05h00 to 19h00. In cases of more complex medical conditions, MPH refers patients to tertiary hospitals around South Africa.

4.3.1 Geographical and spatial characteristics of Mafikeng

MPH is located in the medium-density suburb of Danville. The exact coordinates are 25.8853° S, 25.6579° E. Geographically, Mafikeng lies in the north-western part of the province. It is approximately 330 km from Pretoria and 290 km from Johannesburg (distancecalculator.co.za, 2018). MPH is approximately 4 km from the Mafikeng CBD. Locally, MPH is accessible through a series of secondary urban roads and internal access roads. Regionally and nationally, MPH is accessible through primary regional corridors that include the N4, N18 and R503. Spatially, Mafikeng can be described as a small urban centre of approximately 10-15 kilometres in radius and is predominantly rural in nature.

4.3.2 Mobility systems in Mafikeng

While documented literature on mobility services within the context of Mafikeng appears to be scarce, the major mode of mobility systems is road transportation. Public and private transportation are the main forms of mobility, while walking is also a significant option over shorter travel distances. The main modes of public transportation includes mini-bus taxis, public buses and metered motor-taxis. In terms of existing route design, public transportation services, particularly mini-bus taxis and public buses, reportedly follow fixed routes whereby Mafikeng CBD is the main interchange and connectivity precinct. For public transportation services, travelling costs reportedly vary with travel distance and, in some cases with the availability of transportation services at any given time. Table 2 illustrates travelling costs of selected major travel destinations from Mafikeng. At local level (0-10km) the average cost of travelling from one point to another using a mini-bus taxi is R10 and the average cost of travelling per kilometre is R1.

Table 2: Travelling costs of selected major destinations from Mafikeng CBD

<i>Travel description</i>	<i>Average Cost (Rands)</i>	<i>Geographical Classification</i>	<i>Approximate distance travelled (km)</i>	<i>Rand/km</i>
Mafikeng CBD – Montshioa	10	Local Urban Area	6-7	1.4
Mafikeng – Magogoe	10	Local peri-urban area	10-15	0.7
Mafikeng - Ramatlabama	30	Sub-regional Area	25-30	1
Mafikeng - Ganalaagte	80	Rural-Sub regional Area	70-80	1
Mafikeng - Lichtenburg	60	Urban-Sub regional Area	60-70	0.8
Mafikeng - Rustenburg	170	Urban-Sub regional Area Connectivity	200	0.8
Mafikeng -Pretoria	170	Provincial Urban Areas	330	0.5

4.3.3 Operational criteria of mini-bus taxis that service the Mafikeng CBD and MPH routes

Interview discussions with the three selected mini-bus taxi operators reflect that mini-bus taxis, including those that service the MPH route, start operating at 05h00 and end around 18h00. During the morning periods (05h00-08h00), the criteria of operations are that, although public taxis have designated routes, they do not wait (park) at their designated pick-up points (taxi-ranks) and destinations, but operate freely as they aim to maximise on high passenger volumes. Between 08h00-18h00, the criteria is that all mini-bus taxis must go to their respective pick-up (ranking spots) points and queue for travellers. While mini-bus taxis that service MPH have designated travel routes, when necessary, they forego this fixed arrangement to attend to arising service demands. According, to the mini-bus taxi operators, this arrangement reflects the flexibility in service delivery min-bus taxi transportation.

4.3.4 Operational criteria of the Renal Unit at MPH

MPH Renal Unit provides renal treatment service to the surrounding District Hospitals, Community Health Centres and Local Clinics and where necessary, at a provincial level. Table 3 illustrates the main referring health facilities, their geographical location and approximated geographical distances from MPH. During the course of the field survey, the Renal Unit provided renal treatment services to 54 renal dialysis patients on a weekly basis and 11 peritoneal dialysis patients on a monthly basis. The Renal Unit accommodated twelve (12) renal dialysis machines.

Table 3: MPH Renal Unit referral network

<i>Referring Facilities</i>	<i>Location (Sub-District)</i>	<i>Approximate Geographical Distance</i>
Zeerust Hospital	Ramotshere Moiloa	60-80
Thusong Hospital	Ditsobotla	40
General De la Rey Hospital	Ditsobotla	60-70
Delareyville Hospital	Tswaing	80
Mafikeng Provincial Hospital	Mafikeng	0
Local Clinics	Mafikeng	10-20

Geographical distances of referring health facilities range from 0-80km. However, the distances may exceed 80km in cases where referral cases are at a provincial level. At an operational level, the Renal Unit is expected to operate 8 hours a day from 07h30-16h30, but the hours of operation have been extended to 14 hours (from 05h00-19h00) in order to meet the high demand of renal dialysis treatment against limited health care resources.

On the health care service demand side, the Renal Unit admitted sixty-five (65) patients during the course of the field survey, as indicated earlier. The 54 renal dialysis patients required four hours a day of dialysis for three days a week, and once a month for the eleven (11) peritoneal dialysis patients. The longer treatment hours and the high frequency of renal dialysis treatment were reportedly a major health delivery challenge due to health care resource scarcity in the unit. The main challenges that were raised during interview discussions with the unit manager include inadequate renal dialysis machines and Renal Unit health staff. In addition, prevalent breakdowns and longer lead-times to repairs and maintenance of the renal dialysis machines, limited space of the Renal Unit building were also cited as other of the contributing factors that hinders timely access to renal treatment. However, worsening the situation are the erratic travel patterns of renal dialysis patients that are characterised by prevalent late arrival for scheduled treatment.

In order to manage the challenge of high health demand against limited health resources, the Renal Unit Management has put in place some operational interventions. Apart from extension of operational time of the Renal Unit, the fifty-four (54) admitted renal dialysis patients are selectively divided into two treatment groups (on a weekly level). The two groups are further divided into three treatment sessions on a daily basis. This arrangement was done in an attempt to accommodate all the renal dialysis patients (54) to the twelve (12) renal dialysis machines. Table 4 illustrates the grouping of the patients (on a weekly basis) and the daily treatment sessions.

Group A consists of patients who are scheduled for treatment on Monday, Wednesday and Friday and Group B consists of patients who are scheduled to be treated on Tuesdays, Fridays and Saturdays. According to the Renal Unit Manager, Group A consists of patients who travel from remote rural areas. These patients are placed in this group because the management believes that transportation services to and from MPH after treatment are readily available on Mondays, Wednesdays and Fridays. Therefore, the patients who stay far stand a better chance of attending their renal dialysis treatment schedules on these days.

Group B consists of patients who live within close proximity of MPH. The patients are placed in this group because the renal unit management believes that, even though transportation to travel for treatment might be scarce on Tuesday, Thursdays and especially Saturdays, the patients may still manage to travel more easily than patients who stay in remote rural areas, as their travel distances are much shorter and public transportation services in their areas are perceived to be readily available.

Table 4: MPH renal dialysis patient treatment schedule

<i>Group</i>	<i>Treatment Days</i>	<i>Number of Patients</i>	<i>Session A (05h00-11h00)</i>	<i>Session B (11h00-15h00)</i>	<i>Session C (15h00-19h00)</i>
Group A	Monday, Wednesday and Friday	27	12	12	3
Group B	Tuesday, Thursday and Saturday	27	12	12	3

On a daily basis, the renal unit divided the daily treatments into three (3) sessions. The first session runs from 05h00 to 10h00. The second session runs from 11h00 to 14h00 and the third session runs from 15h00 to 18h00. Similar to criteria used to place patients into the weekly group's schedule, the daily treatment sessions were scheduled according to perceived travel distances of the renal dialysis patients. Patients who travel longer distances are scheduled for early treatment sessions (05h00 to 10h00 and 11h00 to 14h00), and patients who travel shorter distances are placed in the late treatment session (15h00 to 18h00). The rationale for these scheduling criteria is that patients who travel longer distances should be provided with the opportunity to travel early from MPH and easily access public transportation services, which were reportedly severely scarce after 18h00.

In addition to the interventions discussed above, renal patients who are not formally employed, are registered for social grant gratuity under the in-aid grant as accorded by Social Assistance Act, 2004 (Act No. 13 of 2004). According to the renal unit management, provision of a social grant is to enable renal patients to meet travelling costs for their treatment, dietary requirements and other health-related needs like the cost of medicine that may be prescribed at any given time. In other words, financial assistance for renal patients is expected to improve their access to health care services in various ways, including access to transportation services.

4.3.5 Demographic profile of renal dialysis patient respondents at qualitative research analysis stage

Of the 24 semi-structured interviews that were successfully conducted at the category of renal dialysis patient respondents, thirteen (13) of the respondents were females and eleven (11) were males. The age group ranged from 25 to 63 years. All the respondents were from the four sub-districts of the Ngaka Modiri Molema District (Ramotsehre Moiloa, Tswaing, Mafikeng and Ditsobotla sub-districts) where MPH is located. Three (3) of the respondents reside in Mafikeng's urban area and twenty-one (21) are from rural, semi-rural or semi-urban areas that surround Mafikeng town. This reflects that the majority of the respondents experience longer travel distances as compared to those who stay within the Mafikeng urban area, where the MPH is located.

4.4 Defining renal dialysis patient travel trip at MPH

Carreira et al (2016) simply defines a travel trip as a complete journey. It encompasses all travel experiences of clients, where a complete trip includes pre-travel experiences to post-trip experiences and recollection phases that include planning for future journeys. Similarly, this qualitative research study finds that the attributes of a complete journey for renal dialysis patients include *the pre-trip experience (pre-treatment travel preparation activities); on-site travel experience (travel journey to the hospital for treatment); treatment phase activities (from arrival time at MPH to the time of departure from MPH); return travel activities and intended post-treatment travel activities and the recollection phase (preparation for the next day)*. While interview discussions find that all the patients undergo this same trip experience, their travel phenomena are particularly influenced by certain travel factors, which the research identified as core patient travel determinants.

4.5 The core determinants of patient travel phenomena at MPH

From interview discussions, what overarches renal dialysis patient travel phenomena at MPH is the desperate need for early access to renal dialysis treatment. Because of the uncertainties created by the unreliable and inadequate renal dialysis machines, patients compete for the opportunity for early access to renal dialysis treatment. This scenario results in early travel trends, as one of the patient respondents indicated, *"I leave my home at 02h30 because I want to get to the machine early."* On the other hand, the inadequacy of renal dialysis machines creates a queuing effect (Moller, 2014) whereby patients have to wait for their turn to receive treatment in accordance with the time that they have arrived at MPH (which partially renders the operational interventions ineffective). This scenario results in some patients leaving MPH late,

as one of the patient respondents said, “*Many times I leave the hospital late because the machines are not enough and I only get to the machines sometimes around 4pm.*” The fundamental feature of this early and late travelling often results in limited availability of transportation services with diverse negative implications on accessibility to health care.

Although the lack of health care resources emerges as the core determinant that overarches patient travel phenomena to MPH, this qualitative research also finds that factors such as *geographical location, travel distances, travelling times, spatial location, travelling costs, medical condition of patients, and high frequency of travelling for renal dialysis treatment* among others, have an impact on patient travel phenomena with varying magnitude and implications, depending on the mode of transportation services that the patient would have planned to use. Subsequently it is important to discuss the major emerging transportation services used by renal dialysis patients at MPH prior to presentation of the main research findings. This provides contextual background to the detailed discussions.

4.6 Renal dialysis patient transportation services at MPH

From interview discussions, *mini-bus taxis, public buses, planned patient transportation (PPTs), privately owned cars, walking and pre-arranged private cars* were identified as the main modes of mobility for patient travel journeys for renal treatment. Table 5 illustrates the summary of the main planned transportation services. The majority of the renal dialysis patients use mini-bus taxis and planned patient transportation services.

Table 5: Main modes of current patient transportation services for renal patients at MPH

<i>Mode of Transport</i>	<i>No. of Respondents</i>	<i>Weighting (%)</i>
Walking	1	4.2
Mini-bus taxi	8	33.3
Planned Patient Transportation (PPT)	7	29.2
Privately-owned Car	4	16.7
Pre-arranged Private Car	2	8.3
Public Bus	2	8.3
Total	24	100

For reasons of clarity on the research findings’ discussions, it is necessary to briefly discuss planned patient transportation services. Planned Patient Transportation Services refers to a non-emergency patient transportation service that was provided by the various health facilities in the North West Province. Interview discussions identified two types of PPTs at MPH. The first type referred in this research as Planned Patient Transportation Type A provides transportation services between or among public health facilities. The second type, referred to in this research

study as Planned Patient Transportation Services Type B, extends the scope of services to include provision of transportation services that pick up patients from their homes and take them to MPH for renal treatment, and after treatment, pick them up from MPH and take them to their various homes.

4.7 Renal dialysis patient travel sequence at MPH

Identifying patient travel sequence is necessary to this study, as it provides a contextual background to understanding of patients’ travel experiences during their journeys for treatment. From interview discussions, apart from respondents who use planned patient transportation service Type B, own private cars or pre-arranged private cars, the majority of the respondents indicated that they have a multimodal travel sequence as illustrated in Table 6.

46% of the respondents indicated that they walk to access mini-bus taxis, which directly take them to MPH. 17% of the respondents indicated that they walk to access mini-bus taxis, which take them to health facilities where Planned Patient Transportation Services Type picks them A, that will then take them to MPH. During travel journeys from MPH to go home after renal dialysis treatment, all the respondents indicated that they access their transportation services from MPH.

Table 6: Renal dialysis patients travel sequence at MPH

<i>Mode of Access to Planned Patient Transportation Services</i>	<i>No. of Respondents</i>	<i>Planned mode of mobility</i>	<i>Weighting (%)</i>
Walking (alone)	11	Public Taxi	46
Walking - Mini-bus taxis	4	Planned Patient Transport Type A	17
Picked up from home	4	Planned Patient Transport Type B	17
	4	Own Private Car	17
	1	Pre-arranged Private car	4

4.8 Qualitative research findings: identified patient travel needs

Fifteen (15) major patient travel attributes emerged from the interview discussions. Through content analysis, these patient travel attributes were classified as patient travel needs as arising from their implications on the individual or group of individual’ s wellbeing. They are discussed in detail below.

Finding No. 1: Provision of readily-available transportation services for patient travelling from home to MPH

From the interview, discussions it merged that renal dialysis patients would require to be provided with readily available transportation services for their travelling from home to MPH. The majority of the respondents who use mini-bus taxis indicated that they often face travelling challenges due to limited transportation services. In this regard, geographical location and travelling times were found to be the main factors. As some of the patient respondents highlighted: *“I moved from my home to find accommodation near the hospital because where I stay there is no transport sometimes.”* *“It is difficult to find transport to travel to the hospital because I leave my house around 02h30 and there are no taxis.”* Furthermore, some of the patients indicated that transportation services are limited during certain days of the week like Thursdays and Wednesdays and Sundays. Generally, availability of public transportation services were found to be scarcer as the geographical distance from MPH increases and during early travelling times. While patient respondents who use planned patient transportation services Type B, own private cars and prearranged care indicated that they are less likely to face transportation challenges to travel to MPH, these views were also confirmed by the renal unit management, which indicated prevalent delays of patient arrival at MPH as major concern, and the mini-bus taxi operators who indicated that they often start operating around 05h00. Apart from cases of missed treatments, safety risks due to early travelling, respondents also indicated increased transportation costs as patients are often compelled to find alternative transportation services or to move from where they are staying and find accommodation in close proximity to the hospital.

Finding No.2: Provision of readily-available transportation service for renal dialysis patients travelling from MPH to their homes

Although the majority of the renal dialysis patients indicated that they could easily access their transportation services at MPH when travelling after treatment, they also indicated that they often experience lack of transportation services. As some of the respondents highlighted: *“If I finish my treatment early, around 11h00, I have to wait longer before the mini-bus taxi can take us to town.”* So travelling times were found to be the major influential factor of the lack of readily available transportation services for patients to travel from MPH after treatment. In addition to longer waiting times, the majority of the respondents who are in the third treatment session of the day (15h00-18h00) indicated that they often have difficulties finding mini-bus taxis after 18h00 at MPH and also in Mafikeng CBD. This view was also confirmed by mini-bus taxi

operators who indicated that their service delivery diminishes after 15h00, as the volume of client flow diminishes. Although planned patient transportation services were generally regarded as readily available to travel from MPH for respondents who uses PPTs, some of the respondents highlighted that they sometimes are forced to wait for longer times, as the vehicles that they would have used might be assigned somewhere else. In contrast, patients who use their own cars and pre-arranged transportation indicated that their transportation services are readily available for travelling home from MPH.

The implications of lack of readily available transportation services were found to be numerous. Amongst others increased transportations costs, safety risks and risks of worsening medical conditions. As one of the respondents said, *“Leaving Mafikeng after 18h00 is a challenge in winter because it’ s very cold and sometimes it makes me feel sick and another time I had to ask the nurse to drop me off in town.”* Late travellers from MPH also highlighted the increased cost of transportation services and exposure to safety risks, worsening medical conditions and frustration as the major challenges associated with lack of provision of readily available transportation for patients travelling from MPH to their homes.

Finding No. 3: Convenient travelling times

Even in cases where transportation services might be readily available, one of the outcomes of the interview discussions with the renal patient respondents is that they would prefer to travel during convenient times. In this regard, convenient travel times were said to be times of the day that provide patients with the opportunity to engage in other social and economic activities. As some of the respondents noted: *“...I cannot go and fetch water for my house because I always leave early and sometimes get home late...”; I cannot go to the bank because I always leave the hospital late and sometimes I will be rushing to get transport from town to go home...”* Early and late travelling times often result in the exclusion of renal patients from engaging in other social and economic activities; particularly as social and economic amenities will be closed or could not be accessed, and as patients forego the need by rushing to find scarce transportation services. In this regard, a significant number of the patients’ respondents highlighted that they would prefer transportation services being available during times that are more convenient.

Finding No.4: Provision of easily-accessible transportation services

“I do not have a problem with my journeys because the transport that I use pick me up from home and take me to MPH. The transport

also drops me off at home after treatment.” (Patient Respondent, September 2017)

Provision of easily-accessible transportation services emerged from interview discussions as one of the major travel needs for renal patients at MPH. Remote geographical location, particularly for those who do not stay in close proximity to the public transportation travel routes was discussed by the majority of patients who stay in rural areas as the primary access to transportation challenge. As one respondent mentioned: *“I cannot use hospital transport (PPTs Type B) because the route that the transportation uses does not pass through where I stay.”* To further assert the importance of easily accessible transportation services, patient respondents who use PPTs Type B, own private cars and pre-arranged private cars, and those who stay in the Mafikeng urban area expressed greater satisfaction with regards to accessibility to their planned transportation services.

Similar to lack of provision of readily-available transportation services, lack of provision of easily-accessible transportation services was found to have numerous implications for the wellbeing the patient respondents. Some of the common challenges raised during interview discussions include exhaustion, as patients walk longer distances to access transportation, exposure to worsening medical conditions and, in some cases, missed treatment schedules. As one of the respondents noted: *“I am always exhausted when I reach the hospital because I have to run to where I get the taxi because if I miss it in the morning, I cannot come to the hospital.”* The majority of the respondents indicated that they prefer to use Planned Transportation Services Type B as they are easily accessible. For example, the group of patients who are using PPTs Type B indicated that they would prefer that the hospital continues to provide them with transportation services, while those who do not have the services, suggested as intervention; that they would prefer to have transportation services that pick them from their homes and take them to MPH, and services that pick them up from MPH after treatment and take them to their various homes.

Finding No.5: Provision of efficient transportation services (manageable travelling distances and acceptable travelling times)

“Buses are cheaper than mini-bus taxis but I do not use the bus because it takes a longer route to drop off other people. So i use taxis because they use short routes and they travel fast so I arrive here on time.” (Patient Respondent, September 2017)

Provision of efficient transportation service was mentioned by both the renal unit management and patient respondents as an important travelling requirement. Respondents who use public

transportation services indicated that transportation service operations should be able to reduce the risk of delays associated with longer travelling distances and longer travelling times. In this regard, efficiency of transportation services, particularly the ability to manage travelling times, emerged as one of the determining factors for the choice of mode of transportation services, irrespective of travelling costs. In support of this view, one of the respondent said: *“I use hospital transportation and sometimes we travel with the bakkie and sometimes we travel with the mini-bus, but I prefer the car (sedan type) because it travels faster and we reach the hospital on time.”* Apart from delays and increased costs of travelling, one of the major implications of inefficient transportations services highlighted during interview discussions is that inefficient transportation often leads to exhaustion and frustration, as patients spend longer times travelling. According to the renal unit management, this situation is further worsened by the high travelling frequencies for renal dialysis treatment.

Finding No.6: Provision of reliable and dependable transportation services

“Even if we arrive at Lehurutshe Hospital on time and we find our transport there, we often get delayed because our transportation usually breaks down and we have to wait for the hospital to provide other transport or we have to look for mini-bus taxis to take us to MPH.” (Patient Respondent, 2017).

Carreira et al (2016) and Litman (2014; 2017) define reliability and dependability of transportation services as the frequency of availability mobile services and the extent to which they follow published schedules. Within the context of this definition, interview discussions find that patients would require reliable and dependable transportation services if they are to easily access the renal unit at MPH.

Prevalent breakdown of transportation vehicles, inadequate drivers and in some cases unavailability of the actual transportation, were the major reasons raised by the patient respondents who use PPTs, the renal unit management and MPH Transport manager as the causes of delays to access to renal dialysis treatment at MPH. In addition, the poor condition of vehicles was raised mainly by respondents who use their own private cars as one of the causes of unreliable and dependable transportation services while longer waiting times emerged as the major travel challenge for respondents who use minibus taxi transportation. Apart from untimely access to renal treatment, lack of transportation services and ultimately increased costs of travel as patients are forced to find alternative services to travel to MPH, were some of the main challenges raised during interview discussions with the patient respondents.

Finding No.7: Provision of easily-connected transportation services

Litman (2017) asserts that spatial connectivity is influential to timely access of intended services. He further highlights that, depending on transportation densities, easily-connected transportation services have the potential to significantly reduce travel delays associated with waiting and travelling times. In support of this argument and as highlighted by one of the respondents: *“I prefer using mini-bus taxis because they pass through town (Mafikeng CBD)”*, provision of easily-connected transportation does not only reduce travel delays but also has an influence on the choice of transportation services, regardless of the travelling costs.

In support of this finding, both renal dialysis patients who stay in rural areas and in the Mafikeng urban area indicated that provision of easily-connected transportation services is an important travel factor because it provides patients with the opportunity to access other desired transportation services that allow them to travel and attend to other activities apart from travelling for renal treatment. For example, one of the issues raised by some patients during interview discussions is that, due to their multiple medical conditions, they would need to travel through Mafikeng CBD to look for prescribed medicines from pharmacies, after which they needed to easily connect with transportation services to travel to their homes or any other place without facing travel delays and longer waiting times. Briefly, the general view among patient respondents is that easily-connected transportation services provide the travel flexibility required for them to attend to social, health and economic activities necessary for the maintenance of their wellbeing. From interview discussions, and as indicated in the background to the cases study, it emerged that good connectivity is one of the major positive attributes that mini-bus taxi transportation services have managed to provide to a certain extent and have heavily influenced the choice of its use, regardless of the high travel costs.

Finding No 8: Provision of effective communication and information systems

The ability for renal dialysis patients to plan in advance for their travelling for treatment emerged during interview discussions as a major patient travel need. In this regard, provision of effective communication and information systems was viewed as a critical aspect. Similar to travelling times or the lack thereof, poor communication and information systems often result in unavailability of desired transportation services. As highlighted by one of the respondents who uses PPTs Type A: *“Only if the hospital (Lehurutshe Hospital Management) will let us know in advance that the transportation will be late, then we will know how to plan our journeys in advance. In most cases, we arrive at the hospital only to find that the transport is not there.”* Due to poor communicating and information systems, which often lead to lack of transportation,

patients indicated that they often have to look for alternative transportation, which results in increased transportation costs and more often, in delayed access to renal treatment and ultimately late departure from MPH. In cases where the affected patients do not have sufficient travelling funds, they are forced to go back home without having been treated.

In further support of this finding, the renal unit management indicated that: *“We often have to extend our treatment sessions as patients arrive here late because they are not told in advance by the referring facilities that their transportation services will not be available.”* The renal unit management also indicated that the prevalent travel delays disrupt their treatment schedule as they are forced to find alternative transportation services on behalf of patients. In cases where patients completely miss treatment, the renal unit indicated that they would have to improvise and make time outside their planned treatment schedules to ensure that patients receive the three renal dialysis treatments per week, which makes management of patient treatment a health delivery challenge.

On the other hand, mini-bus taxi operators acknowledged the importance of an effective communication system on accessibility to transportation services. Although this was raised in relation to improved business operations, it emerged that it also improves accessibility to transportation services on the part of the patient travellers. In this regard, one of the mini-bus taxi operators highlighted: *“We have created hotspots in town (Mafikeng CBD) where during the morning periods, patients wait for us and we pick them up without them going and queuing at the ranks.”* Although mini-bus taxis operators indicated that the hotspots are not clearly marked, their constant interactions with patients have created a form of communication system, where creation of the hotspots have become an effective way of improving accessibility to transportation services for patients who travel to MPH for treatment.

Finding No.9: Provision of adequate and appropriate universal access infrastructure

Provision of adequate and appropriate universal infrastructure emerged from interview discussions as a travel need that mainly enhances patient travel journeys. As one of the mini-bus taxi operators responded: *“When we travel with patients, we spend a lot of time because sometimes I have to take them to the pavements, and in some cases, especially when it’s raining, patients do not want to walk to the taxi rank here at the hospital because there are no covered walkways. Therefore, we end up going into the hospital site and pick them up from there. This causes delays for both us and it also delays the patients.”* The lack of appropriate and adequate universal access infrastructure such as ramps and covered walkways can be a barrier to access to

transportation services, especially because some of the patients are in poor medical condition. In addition the lack of provision of mobility-enhancing gadgets, wheelchairs at the MPH mini-bus taxi rank result in travel delays as mini-bus taxi operators are compelled to assist patients to gain access to the hospital or to transportation services after treatment. Apart from travel delays, exposure to adverse weather conditions like rain exposes patients to the risk of worsening medical conditions. In view of the discourse on the maintenance of wellbeing, provision of appreciate and adequate universal access infrastructure is an important patient travel need.

Finding 10: Provision of appropriate mode of planned transportation services

“...the Hospital Transport (Planned Patient Transportation Services) is not fine. Sometimes we use a mini-bus and sometimes we use an open truck. I have asthma and sometimes I get sick and there is no-one to help or oxygen to use...” (Patient Respondent, September 2017)

Provision of appropriate transportation services emerged during interview discussions as important travel requirements, particularly for the patients who has multiple medical conditions. Some of the issues highlighted by patient respondents include the lack of necessary medical instruments or equipment that could be used in case of worsening medical conditions. In addition, the issues of comfort were raised by both patient respondents and mini-bus taxi operators, for example, *“The challenge of travelling with (mini-bus) taxis is that it is very cold during winter and this makes me feel sick sometimes.”* Patients require a comfortable travelling environment. In support of this view, one mini-bus taxi operator indicated that, *“The challenge of transporting patients is that in most cases they would need to occupy the whole seat because their poor physical condition.”* The travel challenge of limited seating space was also confirmed by the majority of patient residents who use mini-bus taxis.

In addition to the above, the issue of stigma emerged as one of the travel challenges for patients who use mini-bus taxis. As indicated by mini-bus taxi operators: *“Sometimes you have to carry a patient who is seriously ill or who has epilepsy, and when other passengers see these patients, they do not want to sit next to them; or they refuse to use our transport services.”* Current transportation services, particularly mini-bus taxis, do not provide the necessary protection of patients against stigma. Apart from loss of income on the part of the mini-bus taxi operators, Segrastano et al (2014) highlights that stigma can be a huge barrier to access to the desired non-emergency transportation services.

Finding 11: Provision of a dedicated travelling assistant

Closely related to the provision of appropriate transportation services is the need for a travelling assistant. As one of the patient respondents said, *“I need someone to help me to travel because I do not know when I feel sick.”* While this need was rarely raised by the majority of respondents, some of the patients indicated they would ask their relatives to accompany them to MPH when they feel very sick (in cases of worsening medical conditions). Interview discussions also find that what limits patients from having a dedicated travel assistant is the high costs of travelling and the long periods of time that they spend at MPH. One of the respondents remarked, *“I cannot have someone coming with me to the hospital all the time because we will spend more money, and we spend a lot of time here (at the hospital) and they would not be able to do anything else during that time.”* Apart from the unaffordability of transportation services and social and economic exclusion on the part of the travel assistant, the lack of a dedicated travelling assistant exposes patients to safety risks, as one of the respondents who uses an own private car mentioned, *“One day I felt dizzy and I fainted as I was tired from treatment and I lost control of the car in the middle of the road.”* In response to lack of this travel need, some of the respondents who use Planned Patient Transportation services suggested that it would be better if the hospital could provide staff to assist them during their journeys for treatment.

Finding 12: Provision of sufficient facilities of convenience during patient travelling

Literature studies that include Health Canada (2005) and NHS (2006), and interview discussions, reflect that the provision of facilities of convenience (like toilets, appropriate sleeping and resting places) during patient travelling for treatment is a critical aspect of ensuring patient comfort. Although this travel need was less discussed among selected respondents, some of the patient respondents who use Planned Patient Transportation indicated that, due to their multiple medical conditions, they would require to use facilities like rest rooms and ablutions during their travel. As stated by one of the patient respondents, *“We travel a long distance from Lehurutshe and because I am sick, sometimes I would need to use the toilets but I cannot because there are no toilets on the way.”*

In addition, renal patients indicated that facilities of convenience, like resting places, become even more crucial during their journeys when they are travelling late. For example, renal dialysis patient from Ramotshere Moiloa Sub-district who uses Planned Patient Transportation Type A indicated that, in cases of them leaving MPH after 18h00, they usually arrive at Lehurutshe Hospital late (after 18h00), and often they do not find transportation services to take them to their various homes. Subsequently, they will have to spend the night at the Lehurutshe Hospital in

the Outpatients Department, without proper sleeping needs like beds and blankets. This results in exposing patients to worsening medical conditions, particularly when patients are exposed to adverse weather conditions like winter nights. In view of these travelling trends, patients indicated that they would require sufficient and appropriate facilities of convenience like toilets, change rooms and bathrooms to be provided during the course of their journeys so that their travel experiences becomes more comfortable.

Finding 13: Provision of sufficient and appropriate facilities of convenience at MPH

Similar to discussions in **Finding 12: Provision of sufficient facilities of convenience at MPH**, **Finding 13** emerges during interview discussions not only as a patient travelling need but also as important requirement for effective and efficient operations of the renal unit at MPH. As highlighted by the renal unit management: *“Sometimes we have patients whose medical condition deteriorates and we have to take them to the medical ward because there is no ward for them in this unit.”* The current renal facilities do not have adequate spaces necessary to sufficiently cater for the medical requirements of the patients. This scenario is further worsened by the early arrivals of patients at the hospital and the longer period of time that patients spend at MPH seeking treatment. One of the patient respondents noted: *“I leave my home around 03h00 and arrive here around 04h30 and I have to wait in the car park because the unit is closed by that time...”* Even if the renal unit would operate 24 hours a day, the majority of the patient indicated that spaces, such as resting lounges and kitchens, could not sufficiently accommodate all the waiting patients at once. Hence, the majority of the patients will have to wait outside the unit. Some of the patient respondents even complained about the design of the unit, particularly the location of the public ablution and waiting areas which were viewed as being too close to the main waiting area, and that it lacks privacy.

On the other hand, due to the prevalent late departure of some patients from MPH and the limited public transportation services after 18h00, the renal unit manager indicated that it would require spaces for the overnight accommodation of patients. However, because such spaces are not available at the renal unit, affected patients are forced to travel late. This does not only jeopardise patients’ safety, but often results in increased travelling costs, as patients have to find alternative transportation services. As the renal unit manager noted, *“We have been promised that there are plans to upgrade the renal unit. Maybe we will have to suggest that they build a new unit to accommodate all needs.”* There is a need to upgrade the renal unit and provide sufficient and appropriate facilities of convenience that are easily accessible to enhance patients’ travelling comfort.

Finding 14: Provision of affordable non-emergency transportation services

From interview discussions, the cost of transportation emerged as a major travelling challenge. At quasi-statistical level, approximately 83% of the renal dialysis patients depend on social grants of R1600. As the renal unit mentioned, *“The social grant money we provide to patients is not enough to cover all their needs for renal treatment. Sometimes we give them prescriptions to go and buy medication and food that are required for their nutrition. This would mean that most of the patients do not have money to travel for treatment.”* This reflects that the majority of the patients face travelling challenges because their poor financial condition.

Among patient respondents, longer travelling distances were cited as the main cause of unaffordable transportation costs. The majority of the residents who use mini-bus taxis indicated that they cannot afford transportation services because they stay far. These views were also raised by mini-bus taxi operators who indicated that they often have to provide free transportation or give money for transportation services to patients who come to ask for help.

Apart from longer distances and insufficient income and similar to the implications of poor communication and information systems, lack of transportation services, particularly during early and late travelling times result in increased cost of transportation services as patients have to find alternative travelling services. As highlighted by one patient respondent who uses mini-bus taxis, *“I have missed treatment so many times because I did not have money to travel to the hospital for treatment.”* In this regard, unaffordability becomes a major barrier to the access to non-emergency transportation services and often leads to missed treatments. As part of the suggested interventions, the majority of the patient respondents who use mini-bus taxis and Planned Patient Transportation services Type A suggested that the hospital should either provide them with money to meet some of their travelling costs, while some suggested that the hospital should provide money to meet all their travelling costs.

Finding 15: Provision of a dedicated renal dialysis patient transportation service

Across the spectrum of the entire respondent categories (renal dialysis patients, the hospital management and the mini-bus taxi operators), what was perceived as of significance to improve patient travelling and timely access to renal treatment was the provision of a dedicated renal dialysis patient transportation service. Although this aspect was not clearly defined at patient respondents level, renal unit level and MPH Transport Department, the perception is that a dedicated renal patient transportation service, similar to the already existing planned patient transportation Type B, would significantly improve patient mobility as there are no travelling

costs to be incurred and that the transportation services would be easily accessible. At the mini-bus taxi transportation operators' level, the perception is that their operational services would significantly improve if the hospital could assign them to provide fully subsidised services for the transportation of patients, partly because this would reduce their operational losses associated with transporting patients, and that they would have the ability to transport patients to any place, geographically and spatially. To further assert this view, which was discussed as part of potential interventions, at a quasi-statistical level, approximately 46% of the patient respondents indicated that they would prefer to have a dedicated renal dialysis patients' transportation service as an intervention to their current travelling requirements.

4.9 Analytical overview of qualitative research findings

Notwithstanding the diversity of information obtained from the interview discussions, most of which might not have been expressed with the limitations of the research study, the qualitative research findings shows that provision of effective and efficient transportation is an important dimension of accessibility to health that is lacking at MPH. The qualitative research findings also shows that the lack of this accessibility need has multiple implications on the long term wellbeing not only on renal dialysis patients at MPH (users), but also on the on the health care service providers (renal unit) and the current non-emergency patient transportation services providers (mini-bus taxi operators). While, the qualitative analysis finds that renal dialysis patient travel phenomena is influenced by various factors, that includes spatial and geographical factors, mode of transportation used, financial wellbeing of individuals amongst others, the lack of adequate and sufficient health resources at MPH was identified as the core travel determinant in this case. However and most importantly, the qualitative analysis finds that the patient travel factors have a synergetic relationship, where one factor might have a positive or negative influence on other patient travel factors. Thus patient travel phenomena should be viewed from a holistic perspective, and further asserts the multi-dimensional characteristics of patient travel phenomenal.

Within the context of this brief analytical overview, 15 (fifteen) major renal dialysis patient travel factors, drawn from the accounts of renal dialysis patients, treating doctors, public mini-bus transportation operators, the hospital management and the Transport Directorate at MPH, were phenomenologically described, and based on patient travel experience and its influence on the wellbeing of the respondents, were identified as the major patient travel requirements. In addition to patient travel experiences, suggested interventions also formed part of the identified patient travel requirements as this expressed the most desired travel aspects that has the potential to

improve respondents' wellbeing. In this regard, the qualitative analysis shows that renal patients at MPH requires among other needs, provision of non-emergency patient transportation services that *are readily available, easily accessible and within walkable distances, affordable, reliable and dependable, efficient, easily connected and transportation service that travel during convenient times of the day*. Apart from these needs, and in view of the multiple medical condition of renal patients and the longer times spent at MPH seeking treatment, provision of *sufficient and appropriate facilities of convenience during patient travel journeys for treatment (such as toilets, sleeping areas and resting Lounges), and provision of adequate and appropriate facilities of convenience at MPH* were also identified as spatial travel requirements necessary not only to improve patient travel comfort, but also travel needs that are necessary to mitigate the risk of worsening medical conditions of patients. However, as part of maintaining, enhancing wellbeing of renal patients and mitigating the risks of worsening medical conditions, provision of suitable mode of transportation service were also identified as critical travel patient requirements. In this regard, *provision of appropriate and suitable modes of transportation services and provision of a dedicated patient travel assistant* were identified as the main patient travel requirements.

Further to the needs described in the paragraph above, across, the entire spectrum of the respondents that participated in the semi-structured interviews, particularly from the majority of the renal dialysis patients, *provision of a dedicated renal dialysis patient transportation services, that pick patients from their homes and drop them at MPH, and that pick patients from MPH after treatment and drop them at their various homes* was identified as major patient travel requirement that was raised during interview discussion as suggested interventions to current travel challenges that has the potential to improve accessibility to safe and easily accessible transportation services and ultimately timely access to renal treatment at MPH. While this interventions appears to be a medium-to long term intervention, respondents also suggested *provision of either full travel financial subsidy and partial travel financial subsidy as travel requirements necessary to enhance their poor financial status and cover for the reportedly high travel costs*.

Nonetheless, as part of patient travel experiences, renal unit operational activities and operational activities of the transportation service providers, forward planning emerged as critical tool necessary to enhance accessibility to transportation services and ultimately, timely access to health care services. In this regard, *provision of effective communication and information system* was further identified as a patient need that is important to mitigate travel challenges that are related to availability of transportation services, reduction of potential delays to access to

transportation services and ultimately access to renal treatment. Apart from effective communication and information systems between MPH and the referring health facilities, creation of pick-up hot spots at Mafikeng CBD that are easily identified by travellers was cited by mini-bus transportation operators as a communication tool that has enhanced patient travel experience within the context of the case study.

Closely related to the need to enhance patient travel comfort and travel efficiency, *provision of sufficient and appropriate universal access* infrastructure was identified as critical patient travel that has the potential to improve patient travel comfort at a spatial level and improved travel times as patients can easily access desired amenities with minimal problems, and reduced need for assistance, which in part reduces travel delays, particularly as associated with travel time offset that are experiences as operators are compelled to assist patients in this regard.

While the above discussions summaries the identified patient travel needs, one of the objectives of this study is to understand the relationship between patient travel factors and the discourse of accessibility to health, with the aim of providing a holistic intervention framework that has the capacity to comprehensively address these needs. Similarly, interview accounts from the entire spectrum of respondents chosen for the qualitative analysis also identified how these travel factors impacts on accessibility to health care and further justify their identification as the major patient travel requirements. In this regard, while the competing need for early access to renal dialysis treatment was identified as the core influential factor that overarches the entire of patient travel phenomena, there are other spatial and non-spatial travel factors such as *geographical location, modes of transportation services, travelling routes design, travelling times, patient travel sequence, affordability, accessibility to transportation services*, that have diverse implications on patient travel experiences and ultimately on long term wellbeing of renal patients, transportation services providers and health care service providers.

Fundamentally, the competing need for early access to renal dialysis treatment often results among the majority of the patients, to early travelling times, while the longer treatment times at MPH results to late travel times. From interview discussions, these two travel aspects puts into perspective the importance of provision of readily available transportation services.

The major implications of early travel times is that it exposes patients to health and safety risks. Reportedly potential robberies and mugging (as patients are forced to walk in the dark) were the primary concerns for patients who walks to obtain transportation or to MPH, while exposure to

adverse weather conditions especially in winter and during rainy seasons was also a primary concern raised across by the majority of the patient respondents. The other identified patient travel factors were also found to have interrelated and similar implications on access to health in general.

In a similar vein, while early and late travel times were often viewed to be associated with scarcity of transportation services due to diminishing public transportation operations, remote geographical location was also identified as one major travel challenge as this is often associated with lack of readily available transportation services as services diminishes with the length of geographical distance from MPH leading to longer travel times. Closely related to implications of geographical location on access to transportation services were the implications of spatial access to transportation services, in this case being defined by the transportation travel routes. Travel routes was also found to be an influential factor on the provision of readily available transportation services particularly in view that patients who do not live within the proximity of designated routes often face accessibility to transportation challenges particularly for PPTs Type B. Nonetheless, one of the positive attributes of mini-bus taxi transportation services is their ability to improve spatial access to transportation services by foregoing their designated travel routes to reach out to the areas which are not within the proximity of transportation services travel routes.

To further confirm the need of improved provision of readily available transportation services as related to accessibility to transportation services, provision of transportation services that pick patients from their homes and drop them at MPH for treatment, and that pick patients from MPH and take them to their home is one of the suggestion made by the majority patient respondents to improved access to transportation services.

In addition to the implications of early travel and late travel times, geographical location and provision of easily accessible transportation services, provision of easily connected transportation services was found to be one the influential of timely access to renal treatment, time access to reach where patients live after treatment, and the improvement on the opportunity for patients to attend to other social and economic activities. The salient aspect of this travel factor is easily connected transportation services provide improved opportunity to access other transportation services and subsequently the ability to timely access to treatment and other schedule activities that patients might desire to undertake.

While provision of easily connected transportation services improves the opportunity to improved access to other transportation services, provision of transportation services that travel during convenient times of the day was viewed as critical travel need that also provides the patients with the opportunity to attend to other social and economic activities as patients can easily access the needed amenities as compared to early and late travel times.

In view of the need for timely access to renal treatment, particularly as demanded by health resources scarcity at MPH renal unit, the qualitative research analysis finds that patients would require transportation services that are efficient. In this regard, transportation services should endeavour to reduce delays associated with longer travel distances that leads to longer travel times. The reflections of these findings strongly suggests that efficient transportation services would provide renal patients with the opportunity not only for timely access of renal treatment at MPH, but also allows patients to patients to reach their homes during acceptable times. In addition, it has the potential to reduce potential increase in travel costs as patients avoid seeking alternative transportation services as patients seek to meet their other daily activities.

Closely related to provision of efficient transportation services, is the provision dependable and reliable transportation services. The qualitative research analysis finds the lack of provision of reliable and dependable transportation often results in delayed access to renal treatment and access to where patients as patients experience longer travelling times. While prevalent poor condition of transportation vehicle was cited as the major causes of delay, longer waiting times, particularly for mini-bus taxi operators and PPTs type were indicated as major influential factors of undependable and unreliable transportation services.

While, poor condition and longer waiting times were discussed as major causes of undependability and unreliability of transportation services, forward planning is one of the patient travel factors that impacts on both patient travel experiences and operational efficiency of the renal unit at MPH. In this regard, the lack provision of effective communication and information system within the current patient travel phenomena at MPH was found to be a major barrier to timely access to renal treatment for patients who uses PPTs Type A as in most cases they face travel challenges that are related to information on the availability of their planned transportation services. While this often results in delayed access to treatment, it is an operational burden on part of the renal unit as they are forced to extent treatment hours to mitigate the implications of these erratic travel delays.

In view of the multiple medical condition and potential risks of worsening medical condition of patients at any given time, provision of appropriate and adequate facilities of convenience during patient travel journeys, provision of appropriate and adequate facilities of convenience at MPH's renal unit and provision of appropriate mode of transportation services were cited as travel needs. Provision of facilities of convenience were cited as an important travel aspect for patients who experience longer travel distances as they might need to use facilities of convenience like toilets, and also in cases of delayed departure from MPH as they might need sleeping facilities and resting lounges in cases they do not find transportation services that take them to their homes. While this travel factor was mainly raised by patients who use PPTs Type A, provision of appropriate and adequate facilities of convenience at MPH is a critical travel factor raised by the majority of the patients irrespective of the mode of transportation services used, particularly in view of the comfort required that is necessitated by longer times spent at the hospital waiting for treatment, early travel times, and also by the renal unit in view of the need to accommodate patients with worsening medical conditions. In addition, the need to provide appropriate transportation services was found to be important particularly in view of the poor medical condition of the majority of the patients. In this view, patients would require transportation services that can be boarded and alighted and, that provide comfort with regard to interior environmental conditions such as temperatures and seating spaces. In addition, issues of stigma were raised by public mini-bus transportation operators as one of the major challenges associated with transporting patients during their travel journeys for treatment.

To further mitigate potential health risks associated with the medical condition of patients, provision of a dedicated patient travel assistant emerged as one of the important travel needs. The common view is that a travel assistant will provide the necessary help in cases of worsening medical conditions.

While the above discussions primarily discuss, spatial and medical needs related to patient travel experiences, provision of affordable transportation services is a critical travel need in this case, particularly in view that the majority of the renal patients are not formally employed, with limited financial resources and have limited opportunities to participate in broader economic activities as they spent most of their time seeking treatment due longer treatment times and the high frequency renal dialysis treatment schedules. In this view, the majority of the renal patients would prefer provision of affordable transportation services to mitigate the financial burden that is associated with the travelling costs and the need to meet other social and health costs, which are exacerbated by the insufficient social grant that they receive.

In view of the brief discussions on the patient travel needs, the diverse implications of these travel experiences on the wellbeing of renal patients at MPH, transportation services providers and the operations of the renal unit at MPH reflects that the current non-emergency patient transportation services is indeed a barrier to accessibility to health care at MPH and the long term maintenance of individual wellbeing. The qualitative research analysis reflects that, scarcity, poorly accessible, unsuitable modes of transportation; poorly accessible; unreliable and undependable, inefficient; unaffordable non-emergency transportation services often results in reported prevalence of missed cases of treatment, health and safety risks that leads to poor health outcomes. In addition, this lack of provision of efficient and effective transportation services also results in poor psychological and physical health of patients and health providers. In the case renal patients, these poor health outcomes are exacerbated by the high frequency of travel, while on health providers, increased extended operational times leads to exhaustion and frustration.

Nonetheless, social and economic exclusions also emerged as one of the challenges related to provision of ineffective and efficient non-emergency patient transportation services at MPH. While limited participation in economic and social activities due to delayed access to treatment, longer waiting times to obtain renal treatment, and limited opportunities were raised as major negative factors in this regard, prevalent loss of income on the part of the mini-bus taxi operators particularly in view that the majority of the patients cannot afford the transportation costs for their travel which compels operators to provide free services as a gesture of empathy.

Apart from poor health outcomes, one of the salient findings of the qualitative findings is that, the current mitigation measures put in place by the renal unit are to improve access to renal treatment are rendered ineffective particularly in view of the continued erratic patterns of patients; and that the patient travel phenomena reflects a synergetic relationship among the patient travel factors. With regards to operational efficiency of the renal unit, delayed arrival of patients often associated with unreliable and undependable transportation services renders extension of operation hours for treatment ineffective as the patient are continually delayed. Furthermore, the high costs of travel often associated with seeking alternative transportation services in cases of delayed departure; unavailability of planned transportation services often results in increased costs which renders provision of social grant less effective in mitigating patient travel costs, and which also reflects on the interrelatedness of patient travel factors.

Nonetheless, the qualitative research analysis findings also reflects that provision of non-emergency transportation should not only be viewed from the patient perspective, but also from

the perspective of the providers of these services. This underlines the multidimensional aspect of accessibility to health. However, the main suggestions for provision of a dedicated renal dialysis patient transportation services that is easily, easily accessible, affordable and readily available also reflects on the need to provide effective and efficient non-emergency patient transportation services as important determinant of health.

4.10 SECTION 2: QUANTITATIVE RESEARCH ANALYSIS

4.11 Background to quantitative research analysis

Section 2 of this chapter presents the quantitative research analysis. The research questionnaire is presented in Annexure F. The questionnaire consists of 17 open-ended questions and 3 closed-ended questions that were developed from the qualitative research findings. Using the Likert scale, the questionnaire measures the level of agreement and the level of importance of the research statements. Respondents were asked to choose from the following description ranges (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree, 5 = strongly agree, 6 = refused to answer and 7 = not applicable) for the level of agreement, and in the description ranges (1 = very unimportant; 2 = slightly unimportant; 3 = neither important nor unimportant; 4 = slightly important, 5 = very important, 6 = refused to answer and 7 = not applicable) for the level of importance. The questionnaire also captured demographic information of the respondents that included, age gender, treatment sessions attended, mode of transportation services used to travel for renal treatment and cost of travel for a full trip.

Table 8 below illustrates the refined research statements from qualitative research discussion as presented in the research questionnaires. While provision of sufficient and appropriate universal access infrastructure and provision of effective communication and information systems were identified as major patient travel requirements, they were not included for quantitative analysis as they were viewed as areas that require further study. The research statements were coded in accordance with the sequence in which they were presented in the research questionnaire. Data from the successfully completed questionnaires was captured and analysed using SPSSx to produce percentiles, mean and standard deviation values for each statement.

Table 7: Travelling attribute statement coding

<i>Selected patient travelling attribute</i>	<i>Statement code</i>	<i>Research statement denotation</i>
Provision of readily available transportation services	1	<i>Provision of readily available transportation services to travel from home to MPH</i>
	2	<i>Provision of readily available transportation services to travel from MPH to go home</i>
Provision of easily accessible transportation services	3	<i>Easily walkable distances to access transportation to travel to MPH</i>
	15	<i>Transportation that picks up and takes patients to travel from home to MPH</i>
	16	<i>Transportation service that takes patients from MPH and drops them off at home</i>
Provision of reliable and dependable transportation services	5	<i>Provision of dependable and reliable transportation services</i>
Provision of efficient transportation services	4	<i>Provision of transportation that is capable of managing delays associated with longer travelling distances</i>
	9	<i>Provision of transportation that travels within acceptable travelling times</i>
Provision of sufficient and appropriate facilities of convenience (e.g. toilets) during patient travelling journeys	12	<i>Provision of facilities of sufficient and appropriate convenience during travelling for renal dialysis treatment</i>
Provision of appropriate transportation services	17	<i>Provision of a dedicated travelling assistant</i>
	11	<i>Transportation that does not worsen medical condition of patients</i>
Provision of affordable transportation services	6	<i>Affordability of existing planned transportation services</i>
	7	<i>Partial travelling subsidy (provision of a dedicated financial subsidy to cover some of the patient travelling costs)</i>
	8	<i>Full travelling subsidy (provision of a dedicated financial subsidy to cover all of the patient travelling costs)</i>
Provision of sufficient and appropriate facilities of convenience (e.g. waiting rooms/lounge, kitchen) at MPH	13	<i>Provision of facilities of convenience at health facilities (MPH)</i>
Provision of easily connected transportation services	10	<i>Provision of easily connected transportation services in Mafikeng CBD</i>
Provision of a dedicated renal dialysis patient transportation service	14	<i>Provision of a dedicated renal dialysis non-emergency transportation service</i>

Sixty (60) self-completed questionnaires were administered to renal patients at MPH. A total number of 52 respondents (9 peritoneal dialysis patients and 43 renal dialysis patients) successfully completed the questionnaires. However, successful completion of the questionnaires on a particular statement varies among respondents. As outlined in the research design, the first section of the quantitative research findings presents the descriptive statistical analysis, and the second section presents the IPA.

4.12 Reliability of the quantitative research findings

Internal consistency of the scales was measured using the Cronbach alpha testing of 37 respondents as illustrated in Table 7 below. The Cronbach's alpha value for the study was found

to be 0.710, which is greater than the cut-off point of 0.7. This concludes that the data is excellent and consistent. Ssawalqa and Roud (2017) previously applied a similar approach in their study on the degree of applying the role-playing strategy in teaching English Language.

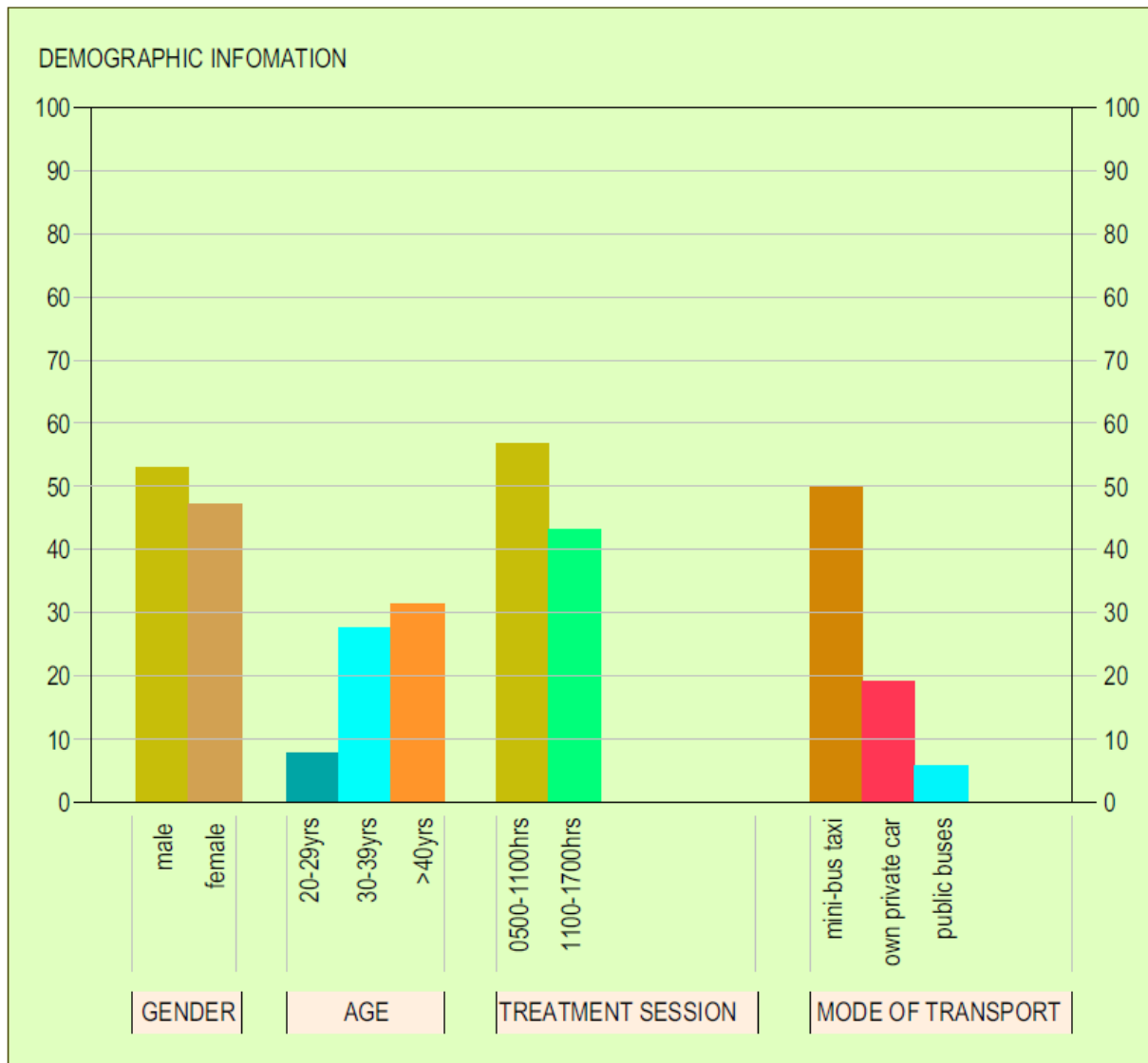
Table 8: Reliability test of the quantitative research questionnaires

<i>Data</i>	<i>Cronbach's Alpha</i>	<i>Items</i>	<i>Comments</i>
Patients who are on repeated treatment for chronic renal disease treatment at Mafikeng Provincial Hospital	0.710	37	acceptable and consistent

4.13 Demographic information

Demographic information collected consists of gender, age group, and place of residence, treatment session, and mode of transportation services used in order of sequence of the journey from home to MPH, and the total amount paid for a one-way journey to hospital. Figure 2 presents the demographic information of the 52 respondents. 52.9% of the respondents were males and 47.1% of the respondents were females. 31.4% of the respondents were between 50-59 years, 27.5% were between 30-39 years and 7.8% were between 20-29 years. All the respondents reside in the North West Province. 56.8% and 43.2% of the respondents attended the 05h00-10h00 and the 11h00 and 17h00 respectively. 50.0%, 19.2% and 5.8% of the respondents respectively used mini-bus taxis, own private cars and public bus transportation services to travel to MPH for treatment. Transportation costs were presented in weeks, days and months depending on the mode of transport. Where necessary, the demographics on travelling costs shall be presented accordingly.

Figure 2: Demographic information of quantities of research analysis respondents



4.14 Descriptive statistical analysis findings

Figure 3 and Table 9 below present the summary of the research findings on the level of agreement and level of importance for each research statement. Percentile values with descriptive ranges (0-49% = poorly met/unimportant; 50-69% = moderately met/important and 70-100% = highly met/highly important) were used to determine the extent to which the travelling needs were met. Figure 2 below illustrates a comparative statistical analysis of the responses to the statements.

Figure 3: Comparative descriptive statistical analysis graph

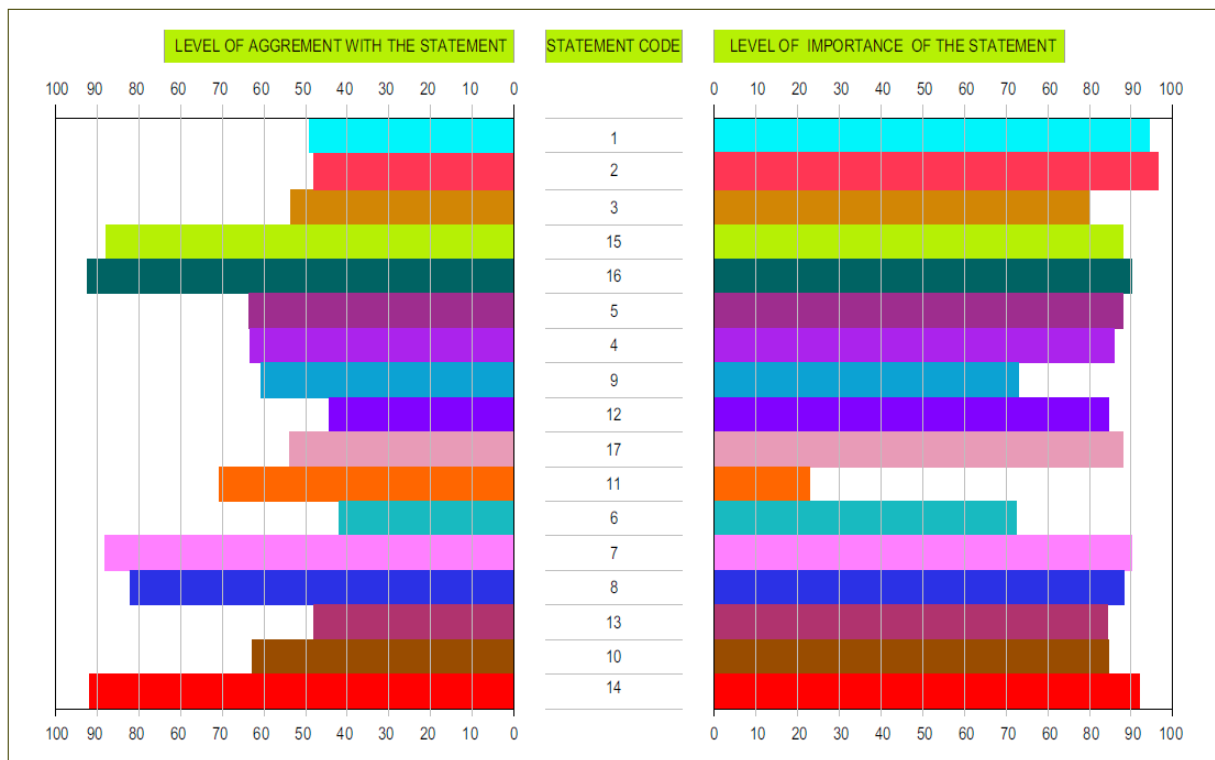


Table 9 below illustrates the descriptive statistical analysis outcome for each of the statements and it also provides the summary of the extent to which each travel attribute has been met within the context of the case based on the combined level of agreements.

Table 9: Summary of the descriptive statistical research findings

Item	Patient Travel Attribute a	Research statement code	Response rate (%)		Extent to which the travelling needs have been met		
			Combined Level of Agreement	Combined Level of Importance	Poorly met (0-49%)	Moderately met (50-69%)	Highly met (70-100%)
1	Provision of readily available transportation services	1	49	94.3	•		
		2	48.1	96.1			
2	Provision of easily accessible transportation services	3	54.9	80	•		
		15	89.9	92			
		16	92.2	90.2			
3	Provision of dependable and reliable transportation	5	63.5	88		•	
4	Provision of efficient transportation services	4	63.3	86			•
		9	60.8	73			

5	Provision of sufficient and appropriate facilities of convenience during patient travelling journeys	12	44.2	84.6	•
6	Provision of appropriate transportation services	17	53.8	88	•
		11	70.6	23	•
7	Provision of affordable transportation services	6	42	72.5	•
		7	88.2	90.2	
		8	82	88.2	
8	Provision of sufficient and appropriate facilities of convenience during patients' treatment at MPH	13	48.1	84.3	•
9	Provision of easily connected transportation services	10	62.7	84.6	•
10	Provision of a dedicated renal dialysis non-emergency patient transportation service	14	91.9	92	•

Finding No.1 Provision of readily availability of transportation services

Quantitative research findings show that provision of readily available transportation services for patient travel journeys from their homes to MPH and for travelling journeys from MPH after renal dialysis *is an important travelling need that has been poorly met* within the context of the case study. These findings are also consistent with qualitative research discussions, which highlight availability of transportation services as being generally scarce. In this regard, 49% of the respondents agreed that transportation services are readily available to travel from their homes to MPH, while 94.3% of the respondents indicated that it is important for them to have readily available transportation to travel from their place of residence to MPH. During travelling journeys from MPH after renal dialysis treatment to go home, 48.1% of the respondents agreed that transportation services are readily available, while 96.1% of the respondents indicated that it is important for them to have readily available transportation services to travel from MPH after renal dialysis treatment.

Finding No.2: Provision of easily accessible transportation services

Similar to the provision of readily available transportation services, provision of easily accessible transportation services was found to be *an important travelling need that has also been poorly met at MPH*. In this regard 54.9% of the respondents agreed that they can easily walk to access planned transportation services, and 80.0% of the respondents indicated that it is important for

them to be able to easily walk to where they pick up their transport to travel to MPH. Furthermore, 89.8% of the respondents believed that there should be transportation that picks them up from their place of residence and takes them to MPH, while 92% of the respondents indicated that it is important for them to have transportation that picks them up from their place of residence and takes them to MPH. On the other hand, 92.2% of the respondents believed that there should be transportation that picks them up from MPH after renal dialysis treatment and takes to their homes, while 90.2% of the respondents indicated that it is important to have such transportation services. In confirmation of the qualitative research discussions, these findings reflect that the current non-emergency transportation services are not easily accessible, meanwhile provision of easily accessible transportation services is strongly perceived to be an intervention that has the potential to improve access to renal dialysis treatment.

Finding No.3: Connectivity of transportation services

Measuring connectivity of non-emergency transportation services and its importance was limited to Mafikeng CBD because it is the main transportation interchange precinct for the various modes of transportation services operating within the context of the case study. 62.7% of the respondents agreed that they could easily connect with transportation services at Mafikeng CBD, while 84.6% of the respondents indicated that it is important for them to be able to easily connect with transportation services that operate in Mafikeng Town (CBD) - Mafikeng Provincial Hospital travelling routes. In this regard, provision of easily connected transportation services was found to be a very *important travelling need that has been moderately met* by the current non-emergency transportation services. These findings are also consistent with the qualitative research analysis, which highlights that, although patients sometimes experience travelling challenges related to longer waiting times and scarcity of transportation services during certain times of the day, Mafikeng CBD provides easily accessible and highly connected transportation services, which partly make their travelling journeys much easier.

Finding No.4: Provision of reliable and dependable transportation services

Provision of reliable and dependable transportation services is a non-emergency patient transportation need that has been *relatively met by the current transportation services and was viewed as very important*. 63.5% of the respondents agreed that the planned transportation services are reliable and dependable, while 88% of the respondents indicated that it is important for them to have a dependable and reliable transportation service. Consistency of research findings between quantitative and qualitative analysis is indistinct at the level of agreement of this travelling attribute. This might be because patients used different modes of transportation

services. However, provision of reliable and dependable non-emergency patient transportation services was found to be a very important patient travelling attribute at both qualitative and quantitative research findings. Given the moderate response on the level of agreement to this travelling attribute, it appears that there remains a significant need to improve provision of reliable and dependable transportation services and potentially improve access to renal dialysis treatment services at MPH.

Finding No.5: Provision of efficient transportation services

Ursulica (2016) highlights that there is a relationship between travelling times and managing travelling distances. Transportation services that are capable of travelling within acceptable travelling times have the ability to positively influence the implications of longer travelling distances and thus are argued to be efficient. Quantitative research findings shows that provision of efficient transportation services is a travel need *that is very important and has been moderately met within the context of the case study*. 60.8% of the respondents agreed that their travelling times are acceptable, while 73% of the respondents indicated that it is important for them to be able to travel from their home to MPH within acceptable travelling times. On the other hand, 63.3% agreed that their travelling distances during their journeys for renal dialysis treatment are manageable, while 86 % of the respondents indicated that it is important to have manageable travelling distances.

Given that approximately 80% of the selected respondents stay in rural areas and that travelling distances are between 30-70km as compared to 20% of the respondents who stay in Mafikeng urban area and travel between 5-10km, a comparative analysis of quantitative research findings for this travelling attribute reflects that the current transportation services are moderately efficient in spite of the qualitative research analysis discussions which cite prevalent travel delays that are associated with longer travel distances and longer travel times.

Finding No.6: Provision of sufficient and appropriate facilities of convenience

Similar to provision of readily availability and easily accessible non-emergency patient transportation services, provision of adequate and appropriate facilities of convenience during patient travelling journeys to MPH and at MPH *is travel need that the quantitative research findings show as poorly met and highly important*. 44.2% of the respondents agreed that the travelling routes that they use have sufficient facilities of convenience, meanwhile 84.6% of the respondents indicated that it is important for them to have sufficient facilities of convenience (e.g. toilet facilities, information signs) when they travel for treatment . On the other hand, 48.1%

of the respondents agreed that facilities of convenience (e.g. waiting areas, ablutions, and sleeping quarters) at MPH are sufficient and appropriate, meanwhile 84.3% of the respondents indicated that it is important for them to have sufficient and appropriate facilities of convenience at the MPH.

These quantitative research findings are consistent with qualitative research analysis which cites that the current patient travel design lacks adequate and appropriate provision of facilities of convenience. Given the very high level of importance of these travelling attributes, and also in view that it is lacking, therefore exposes patients to risks of worsening medical conditions and poor travelling comfort and, more importantly, has the potential to either motivate or demotivate patients to travel for renal treatment, improving provision of adequate and sufficient facilities of convenience has a major potential to improved access to renal treatment services.

Finding No.7 Provision of appropriate transportation services

Segrastano et al (2014) highlight appropriate non-emergency transportation services as transportation services that do not expose patients to the risk of a worsening medical condition. Some of the aspect of appropriate transportation services include the relationship between the fitness of vehicle and health, and provision of a dedicated skilled health person. The quantitative research findings show that provision of *appropriate non-emergency transportation services is an important travel need that has been moderately met* within the context of the case study. 53.8% of the respondents agreed that the type of vehicle(s) that they use do not worsen their medical condition, while 88% of the respondents indicated that it is important for them to have a vehicle that do not worsen their medical condition. On the other hand, while 70.6 % of the respondents agreed that it is necessary for them to have someone to assist them during their travelling for renal dialysis treatment, 23% of the respondents indicated that it is important for them to have someone to assist them while travelling for renal dialysis treatment.

These quantitative research findings are consistent with the qualitative research analysis which highlights that the current transportation services are inappropriate in relation to their health conditions as they are not designed to respond to this need. On the other hand, while the desire to consistently have someone to assist patients during their travel journeys is of importance, the importance of this need is potentially eroded by the travelling limitations such as high transportation costs and the long times spent at MPH during renal dialysis treatment, and this explains the low response outcomes on the level of importance of this need as presented in the quantitative research findings.

Finding No.8 Provision of affordable of transportation services

The qualitative research analysis cites unaffordable non-emergency transportation services as a barrier to access to renal dialysis treatment at MPH. Similarly, the quantitative research findings highlight that provision of affordable transportation services *is an important travel need that has been poorly met at MPH*. Furthermore, the majority of the respondents indicated that it is important for them to have part or all of their travelling costs covered by the hospital.

In this regard, 42% of the respondents indicated that they could easily pay for their transportation services without problems, while 72.5% of the respondents indicated that it is important for them to be able to easily pay for their travelling costs for treatment without any problem. 88.2% of the respondents believed that part of their transportation costs should be covered by the hospital while 90.2% of the respondents indicated that it is important for them to have part of their travelling costs for treatment covered by the hospital. On the other hand, 82% of respondents also believed that all costs for transportation should be covered by the hospital, while 88.2% of the respondents indicated that it is important for them to have all of their costs of transport for medical treatment covered by the hospital.

While these findings are also consistent with findings on provision of readily available, appropriate and easily accessible transportation services which are indicated to be important and have been poorly met, the general view is that patients are not satisfied with the current travelling costs and there is a need to seek alternative solutions apart from the social grant financial subsidy to ensure affordability and improved access to transportation services.

Finding No. 9 Provision of a dedicated transportation service for renal dialysis patients

The general view among patient respondents during qualitative research interviews was that the current travelling trends were associated with diverse travelling barriers. As a suggestion to alleviate some of these travelling challenges, provision of a dedicated renal dialysis patient transportation services was either suggested or confirmed to be an important travelling requirement. However, the majority of the respondents at this stage also highlighted that they do not have access to planned patient transportation services.

At the quantitative research analysis stage, 91.9% of the respondents agreed that they believe that the hospital should provide a dedicated transportation service for renal dialysis patients, and 92% of the respondents indicated that it is important for them that the hospital (MPH) provides transport for renal patients. While the quantitative research findings are consistent with the

qualitative research discussions, they also reflect that provision of a dedicated non-emergency renal dialysis patient transportation service is a travelling need that is *a highly important hand that has been poorly met within the context of the case study*.

4.15 Summary of descriptive statistical analysis findings

Table 9 presents the summary of the research findings. The Descriptive Statistical analysis shows that the majority (7 out of 10 as presented in the summary table of the quantitative research findings) of the selected non-emergency patient transportation attributes are important and have been poorly met within the context of the cases. These include:

1. *Provision of readily available transportation services*
2. *Provision of easily accessible transportation services*
3. *Provision of sufficient and appropriate facilities of convenience during patient travel journeys*
4. *Provision of appropriate transportation services*
5. *Provision of affordable transportation services*
6. *Provision of sufficient and appropriate facilities of convenience during patient at MPH*
7. *Provision of a dedicated renal dialysis non-emergency patient transportation services*

The rest of the selected travelling attributes are found to be important and moderately met. These descriptive statistical analysis findings shows a huge need to improve patient travel requirements at MPH. Further, the majority of these findings are consistent and further confirm the qualitative research discussions which highlights that most of these travelling attributes (or lack thereof) are travel barriers with diverse negative implications on access to renal dialysis treatment and patient wellbeing in general. Subsequently, there is a need to propose an intervention strategy through identification of the priority areas by carrying out an Important Performance Analysis as outlined in the research design.

4.16 The Importance Performance Analysis of the selected travelling attributes at MPH

As indicated in Paragraph 4.10, research statements presented in Annexure (E) were further simplified into shorter statements and coded as illustrated in Table 10 for easy handling of the data. For purposes of easy reference, the statement coding follows the sequence as presented in the research questionnaire. Mean values of both the level of agreement and level of importance of the research statements were used to generate the IPA Cartesian diagram. Decker (2017) argues that the use of mean values is a weak analytical strategy, as they do not explicitly reflect on the extreme level of response and neutral scores. However, given the limited sample of

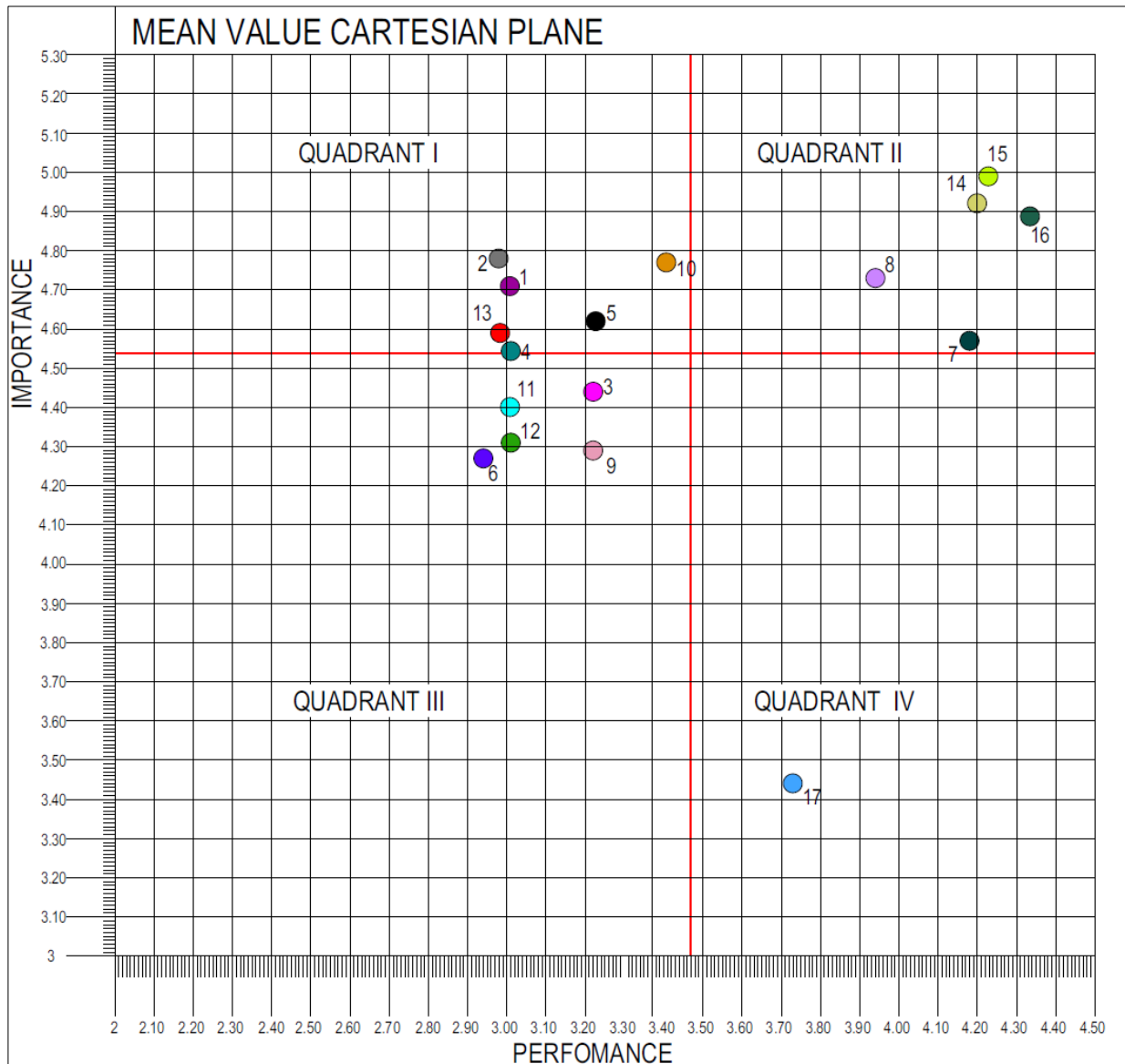
respondents, using mean values was viewed to be the most appropriate statistical method for the IPA.

Table 10: Mean values of responses to the level of Agreement and Importance

<i>Level Agreement (Performance)</i>			<i>Level Importance</i>		
Statement code	Mean Value	Ranking	Statement code	Mean Value	Ranking
13	2.92	15	17	3.44	17
6	2.94	14	6	4.27	16
2	2.98	13	9	4.29	15
1	3.06	12	12	4.31	14
11	3.08	11	11	4.4	13
4	3.1	10	3	4.44	12
12	3.1	10	4	4.54	11
3	3.22	9	7	4.57	10
9	3.22	9	13	4.59	9
5	3.25	8	5	4.62	8
10	3.37	7	1	4.71	7
17	3.73	6	8	4.73	6
8	3.94	5	10	4.77	5
7	4.18	4	2	4.78	4
14	4.2	3	16	4.86	3
15	4.29	2	14	4.92	2
16	4.35	1	15	4.98	1
Overall mean value	3.47	-	-	4.54	-

The mean values of the successfully completed open-ended structured statements were drawn and presented as illustrated in Table 10 above. Similar to previous research studies, including Goncalves (2014), Wong et al (2011), Chen and Li (2014) and Putra et al (2014), the overall mean values were used as the threshold for the importance and performance analysis. Importance mean values (representing the mean values of level of agreement of research statements) were plotted against the y-axis, while performance mean values (representing the mean values of level of importance of research statements) were plotted against the x-axis. Figure 4.1 illustrates the IPA Cartesian diagram analysis. Accordingly, travel attributes 1, 2, 3, 5, 10, and 13 fell into Quadrant I: 7, 8, 14, 15, and 16 fell into Quadrant II: 3, 6, 9, 11 and 12 fell into Quadrant III while travelling attribute 17 fell into Quadrant IV.

Figure 4: The Importance Performance Analysis Cartesian plane



Within the framework of the theoretical explanations of the IPA Cartesian diagram as explained by Wong et al (2011), the interpretation of the IPA quadrants differs theoretically, and within the context of quantitative research analysis, they differ in the meaning of the outcomes depending on how the research statements were presented. For clarity of the discussions, IPA findings were interpreted for each quadrant as presented below.

4.17 IPA Findings

QUADRANT I: Key priority areas of patients’ travelling needs

In interpretation of the IPA framework, the key priority areas of patient travelling attributes include:

1. Provision of readily available transportation services for patients travelling from their homes to MPH for renal dialysis treatment
2. Provision of readily available transportation services for patients travelling from MPH to their homes
3. Provision of easily connected transportation services
4. Provision of dependable and reliable transportation services
5. Provision of sufficient convenience facilities (e.g. waiting rooms, lounges, kitchen, etc.) at MPH
6. Provision of efficient transportation services that have the ability to manage risks of delays associated with long travelling distances.

In interpretation of the IPA, these travelling attributes should be met in any given system or organisation as they form the core of the functions or operations of the organisation. Within the context of this research study, these travelling attributes are the basic patient travel needs that are critical for accessibility to efficient and effective non-emergency patient transportation services and ultimately accessibility to renal dialysis treatment.

QUADRANT II: The strength and pillars of patient travelling phenomena

Quadrant II is a high importance/high-performance category. From the IPA analysis, travelling attributes that fall into this category include the following:

1. Provision of a dedicated patient travel subsidy that covers part of the patient travel cost for renal dialysis treatment.
2. Provision of a dedicated patient travelling subsidy that covers all of the patients' travelling cost for renal dialysis treatment
3. Provision of dedicated transportation services for renal dialysis patients
4. Provision of transportation services that pick patients up from their homes and take them to MPH for renal dialysis treatment (easily accessible transportation services)
5. Provision of transportation services that pick patients up from MPH and take them home again.

While the IPA framework presents these travelling attributes as already existing in a given system or organisation, the qualitative research analysis identifies these travelling attributes as suggested interventions that are either lacking in the current transportation services or that were raised by some respondents as critical for improving or maintaining effective and efficient access to non-emergency patient transportation services for renal patients at MPH. This is the reason

why these travelling attribute has a high importance/high performance outcome in the IPA. In interpretation of this IPA outcomes, these attributes are the driving travelling factors that if put in place, have the potential to strongly enhance improved access to non-emergency transportation services and therefore should be provided to those who do not have access to the services or should be maintained for those who already have access to the services.

QUADRANT III: Areas of low priority of patient travelling phenomena at MPH

Quadrant III was explained as an area of low priority with *low importance/low performance* by the IPA framework. The attributes that fall into this category are viewed as of low importance and pose no threat to the function or operations of any system or organisation. Within the context of this research, the travelling attributes that fall into category include:

1. Provision of transportation that can be accessed within easily walkable distances for patient journeys from their homes to MPH
2. Affordability of current non-emergency transportation services
3. Provision of transportation services that travels within acceptable travelling times
4. Provision of transportation services that do not worsen the medical condition of patients
5. Provision of facilities of sufficient and appropriate convenience while travelling for renal dialysis treatment

One of the salient features of the Quadrant III outcomes within the context of this research study is that they confirm some of the outcomes in Quadrant II. For example, while affordability was confirmed as an area of low importance and low performance, provision of a partial and full travelling subsidy are outcomes of high importance/high performance. This strongly suggest that, while affordability of transportation service is regarded as a travelling attribute of low priority, renal patients would strongly prefer to have part or all of their travelling costs covered by the hospital as a way of improving their opportunity to access to non-emergency transportation services and ultimately access to renal treatment. Therefore, the issue of affordability remains a critical travel factor.

QUANDRANT IV: Travelling attributes that are over-emphasized within the current patient travelling phenomena at MPH

The IPA framework explains categories that fall within this quadrant as overly emphasised operational or functional factors of any organisation or system with low importance/high performance rate. Within the context of this research study, provision of dedicated travelling assistance merges as an IPA outcome that falls within this category. These findings are also

consistent with qualitative research discussions which highlight that, although patients would require to have someone to assist them during their journey, the majority of the patients would require someone to assist them mostly in cases where their medical conditions worsen, that it is regarded as an area of low importance and the high performance outcome indicates that patients have to large extent managed to meet this travel requirement. However, in view that some of the patients indicated that they have multiple medical conditions and do not know when their medical conditions worsen, provision of a dedicated travelling assistant during renal patient journeys for treatment remains a highly relevant to alleviate health and safety risks associated with worsening medical conditions.

4.18 Analytical overview of the research findings

In response to Research Question 2 and Research Question 3, the IPA show how the current non-emergency patient transportation services have performed within the context of the case study. However, the majority of the IPA findings confirms the majority of the qualitative research discussions, which reflects provision of effective and efficient transportation services as major barrier to accessibility to health care at MPH. In synthesis of some literature studies and suggestions made during interview discussions, quantitative research outcomes, the following discussions provides an analysis that highlights some of the important outcomes of this research study and suggested interventions.

4.18.1 Provision of a dedicated renal dialysis patient transportation services

Provision of dedicated renal dialysis patient transportation services emerged from both the qualitative and quantitative research analysis as an important patient travel requirement. At a qualitative research analysis level, this travel need was widely raised as a suggested intervention that has the potential to improve accessibility to non-emergency patient transportation services and ultimately timely access to renal treatment. One of the salient aspect of this suggested intervention is that it provides the opportunity for patients to meet most of their travelling requirements. For, example, according to the interview discussions with the patients, a dedicated renal dialysis patient transportation services has the potential to improve availability of transportation services, affordability, accessibility, dependability and reliability, and most importantly it provides the opportunity to manage the risk of travel delays as this transportation system is only dedicated for renal patients. In other, a dedicated renal dialysis patient transportation services provides the opportunity to meet the core patient travel requirements as found in the IPA analysis.

At descriptive statistical level and IPA, this suggested travelling attribute emerged as an area that has the potential to improve accessibility to non-emergency transportation services and as high important travel need, which confirms the qualitative interview discussions outcomes. Although this travelling need emerged from semi-structured interview discussions as one of the widely discussed suggested interventions, similar approaches have been applied in the USA on their provision of non-emergency transportation services for Veterans (Del-Peterson, 2014). According to Del-Peterson (2014), there are four fundamental aspects to this intervention.

Firstly it has the potential to improve the quantity of transportation services through engagement of various travel agencies and the uses of multimodal travel systems (Schwager 2011, Health Canada, 2005; Del-Peterson 2014). Secondly, it provides the patients with the opportunity to access transportation services as and when they need them. In this regard contractual agreements can be drawn that provide conditions of specific patient travel schedules to complement Renal Unit operations. Thirdly it has the potential to improve spatial accessibility to transportation services. In this regard, contractual agreement can be entered with the various non-emergency patient transportation service providers which would ensure that patients are picked up from their homes and taken to MPH, and picked up from MPH after treatment and returned to their various homes. Fourthly, it provides users with the potential to improved flexibility, connectivity, choice and participation in their travel arrangements. For examples, travelling schedules can be put in place to respond to patient travelling circumstances such as geographical location, travelling distances etc.

Although this appears to be a long term intervention, some of these practices have been implemented in countries such as the USA, Australia and Canada as highlighted in literature studies that include CMS (2016), Chisholm-Smith (2013), Peterson (2014), Council of Social Service of New South Wales (2012), Garrity and Kathy McGehee (2014), Health Canada (2005) and Schwager (2011).

4.18.2 Improving communication and information systems

Effective communication and information systems are highlighted in literature studies (Del-Peterson 2014; Porter et al 2013) and qualitative research findings' discussions as one of the fundamental non-spatial travel aspect that can be a barrier to, or can positively improve access to non-emergency transportation services and desired health services. Del-Peterson (2014) cites provision of health-related information centres in communities, the use of modern technology information systems like internet and emails. Although Porter et al (2013) cites lack of and the

high cost of communication infrastructure and poverty among health care users as some of the major barriers to effective communication systems, particularly in rural areas these, this intervention has the capacity to ensure that patients have sufficient access to information about their travel arrangements and can plan ahead for their journeys for treatment.

Within the context of this research study an improved communication and information system will complement improved operations of dedicated non-emergency renal dialysis transportation services as highlighted in paragraph 4.13.1. In a short term period, and as highlighted the Renal Unit management, an improved communication and information system will provide the opportunity for the unit to plan ahead in cases of any travel related challenges.

4.18.3 Improvement of government vehicle procurement and maintenance policy

One of the widely discussed issues during qualitative interview discussions is the challenge of unreliable and undependable transportation service particularly for those respondents who uses Planned Patient Transportation services (PPTs). The major challenges discussed in this regard include inadequate vehicles and poor vehicle condition and inadequate human resources to operate the vehicles. At a quantitative research analysis, dependability and reliability emerged as one of the core patient travelling needs. While qualitative research discussions indicated mini-bus taxis as relatively dependable and reliable, (for which the residual challenges such long waiting times might be covered under provision of dedicated transportation services), Improving government vehicle procurement and maintenance policy was strongly suggested by the Hospital Transportation Manager as one of the critical intervention to improved access to non-transportation services and ultimately, timely access to renal treatment at MPH for the patients who uses the North West Department of Health's Planned Patient Transportation services. This intervention was perceived to have the potential to improve transportation capacity and efficiency.

4.18.4 Improving operational capacity of the renal unit at MPH

In view of the fact that health supply and demand dynamics were found to be one of the overarching factor of renal patients' travel phenomena, it will be critical to upgrade the capacity of the Renal Unit at MPH. Failure to do so potentially reduces the effectiveness of the suggested interventions. For example, in-spite of improved availability of transportation services, the challenges of early and late travel challenges will remain if health service delivery capacity remains unattended to, particularly in the periods where short-term interventions are put in place.

Therefore, as one of the core travelling needs as per the IPA, up grading of the Renal Unit at MPH remains imperative.

In this regard, and drawing from qualitative interview discussions with both the renal patient and the Renal Unit Manager, related equipment such as renal dialysis machines, improved human resources and the spatial capacity of the unit were raised as the key priority areas for improved operations of the unit. Apart from health technology and human resources requirements, similar interventions such provision of waiting lounges, entertainment areas, short stay facilities (sleeping areas) have been implemented through various options in national health insurance policies of countries such as Britain's National Health Services (NHS, 2006) and Canada's National Health Insurance Benefits (NHIB, 2006).

4.18.5 Provision of a centralised funding system to cover travelling costs for renal dialysis patient travel

Suggested interventions discussed so far appears to be focused on long-to medium term solutions. However, given the importance of access to non-emergency transportation services for renal patients at MPH, it is also important to discuss some of the short term interventions identified in the research findings. In this regard, provision of a centralised funding system to cover for patient travelling cost was identified as one of the most pertinent and urgent short term travel requirement.

From the IPA analysis, ensuring affordability is an outcome that is regarded as a travelling enhancing factor. If improved, it has the potential to improve access to non-emergency transportation services and ultimately renal treatment. However, the qualitative research discussions reflects that the high cost of transportation services is one of the major barrier to accessibility to health care at MPH and for which both partial and full travel subsidy were suggested as important and immediate interventions by patients and the Hospital. In this regard, additional funding will be required as part of the social grant funding system. However for developing state such as South Africa, in the short to medium term a centralised funding system to cover for patient travel cost is considered one of the important travel factors within the context of this research study.

In similar interventions that were identified in the literature review, countries such as Canada (NHIB, 2015) and Australia (Government of Australia, 2016) have made provision in their national health insurance to provide a centralised funding for non-emergency transportation

services. In these countries an eligibility criteria governs the administration of the funds. The eligibility criteria is a set of rules or prequalification requirements that determines the level of funding subsidy to be given to beneficiaries. As part of the social services policy in South Africa, this avenue can be explored and might improve access to transportation services and health on the short to medium term.

4.18.6 Provision of a Non-Emergency Patient Transportation Act

As one of the steps towards the development of non-emergency transportation systems, the Federal State of Australia of Australia's Non-emergency Transportation Act (S.R. No. 28/2016 of 2016), Britain's NHS (2006) and Medicaid in the USA (CMS, 2014) are legal and policy frameworks that provide the operational criteria for the provision of non-emergency patient transportation services that meet the required quality standards. In this regard travelling factors such as the suitability of the transportation vehicles in relation to the medical conditions of clients and the provision of a travel assistant are taken into consideration. In view that the suitability of transportation and the need for a travel assistant were raised during interviews as necessary for improved patient travelling and avoid the risk of worsening medical conditions, provision of a non-emergency transportation act will provide the platform to guide the operational and quality assurance of the non-emergency patient transportation services. In relation to the discourse of accessibility to health care, it further provides the platform for improved equality in health care services provision, particularly as this will be national legislative framework as compared to the splintered system currently practised by the provincial government.

4.19 Summary of research findings and analysis

Using the grounded theory approach and drawing from the implications of renal dialysis patient travel phenomena, the qualitative research analysis identifies 15 major renal dialysis patient travel needs at MPH from the semi-structured interview discussions that included; *provision of readily available transportation services from home to MPH; provision of readily available transportation services for renal patients travelling from MPH to their homes; provision of transportation services that travel during convenient travelling times; provision of transportation services that are easily accessible; provision of efficient transportation services; provision of transportation services that are dependable and reliable; provision of transportation services that are easily connected to other mode of transportation services; provision of effective communication and information system; provision of adequate and appropriate universal access infrastructure; provision of appropriate mode of transportation services; provision of a dedicated travelling assistant; provision of facilities of convenience*

during patient travel journeys; provision of sufficient and appropriate facilities of convenience at MPH; provision of affordable transportation services and provision of a dedicated renal dialysis non-emergency transportation services.

Using descriptive statistical analysis of the selected and refined patient travel attributes, the research study finds that the majority (out of the ten (10) refined travel attributes, seven (7)) of the patient travel attributes were highly important and have been poorly met within the context of the case study. These travel attributes include; *provision of readily available transportation services for both patient travel journeys from their homes to MPH and to travel from MPH to go to their homes after renal treatment; provision of transportation services that travels during convenient travelling time; provision of easily accessible transportation services; provision of sufficient and appropriate facilities of convenience during patient travel journeys; provision of appropriate mode of transportation services; provision of affordable transportation services; provision of sufficient and appropriate facilities of convenience during patient visits at MPH and provision of a dedicated renal dialysis non-emergency patient transportation services.*

In response to Research Question 2 and Research Question 3, the IPA outcomes shows that, *provision of readily available transportation services for patients to travelling from their homes to MPH; provision of readily available transportation services for patients travelling from MPH to go to their homes after renal treatment; provision of a dedicated non-emergency patient transportation services for patient travel journeys; provision of dependable and reliable transportation services; provision of sufficient and appropriate facilities of convenience (e.g. waiting rooms, lounges, kitchen, etc.) at MPH and provision of efficient transportation services that have the ability to manage risks of delays associated with long travelling distances* are the key renal dialysis patient travel needs of top priority .

In synthesis of both the qualitative and the quantitative research analysis, and the literature discussion; six (6) major intervention were identified and discussed. The major interventions include; *provision of a dedicated renal dialysis patient transportation services; improving communication and information systems; Improvement of government vehicle procurement and maintenance policy; improving operational capacity of the renal unit at MPH; and provision of a centralised funding system to cover travelling costs for renal dialysis patient journeys for treatment.* While these suggested interventions were drawn directly from IPA outcomes the development of a *non-emergency patient transportation act in South Africa* was also identified

as an area of long to medium intervention that will underline the overall of an effective and efficient non-emergency patient transportation services.

Notwithstanding the importance of these research findings as guided by the research questions; the research study further confirms the trans-and-interdisciplinary nature of the entire discourse on accessibility to health in various ways. In this regard, this research study finds that provision of efficient and effective non-emergency is a dimension of accessibility to health care that has been poorly met at MPH with diverse implications. The implications range from delayed access to renal treatment, exhaustion, social and economic exclusion and prevalent cases of missed treatment. These implications are all connected to the arguments raised in the literature review, where accessibility to health care was simply reduced to the maintenance of individual or a group of individual's wellbeing. . In brief, provision of efficient and effective non-emergency transportation services at MPH was found to be an important determinant of health and its lack thereof is a barrier to accessibility to health care at MPH.

Nonetheless, over and above the dynamic relationship between provision of effective and efficient non-emergency transportation service and accessibility to health care discussed above, the qualitative research discussions also that the patient travel factors are interrelated and act in a systemic way and thus should be viewed as such, and addressed in a holistic manner. For example, lack of availability of transportation services often leads to increased travel costs and therefore both these factors must be addressed concurrently. The research findings further asserts the importance of effective and responsive spatial planning in health care service delivery. This is supported by the scarcity of transportation services as the geographical distance from MPH increases. This is further supported by scarcity of transportation services in areas where travel routes are not in close proximity to the users. In view of the core patient travel determinants, the research study finds that the implications of health supply and demand are critical in patient travel design. Therefore the capacities of health institutions are of critical importance in the overall patient travel phenomena. In brief, patient travel phenomena is one bundled service package.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The main objective of this research study was to identify non-emergency patient transportation needs for patients with chronic conditions, the extent to which such needs are being met in South Africa; and to identify priority areas of interventions from an operational and policy perspective. In order to achieve these objectives, the study requires inference on the relationship between patient travel experiences and how they affects accessibility to health care. Highlighting this relationship was necessary as it provides the framework for identification of the non-emergency patient travel needs and identification of areas of priority intervention with the aim of improving access to renal dialysis health services.

5.2 Discussion of research findings

Using pragmatic, mixed methods, sequential and explanatory approach research approach, this research study concludes that provision of effective and efficient non-emergency transportation services is indeed an important access need necessary to maximise accessibility to health care services and maintenance of individual wellbeing. Although the lack of sufficient and appropriate provision of health resources was found to be the core determinant of patient travel phenomena in this case, multiple spatial and non-spatial travel factors were also found to have a fundamental influence on access to transportation services and subsequently to access to renal treatment at MPH. Those include among others, the implications of geographical location, travelling times, travel times, affordability of transportation services, suitability of transportation services, communication and information system, dependability and reliability, availability and efficiency of transportation services.

While this need is identified in extant literature as a potential barrier to accessibility to health, it is made more clearer within the context of the cases study that the lack of provision of efficient and effective non-emergency patient transportation services is barrier to accessibility to health care in South Africa, with multiple medical implications on the medium to long term wellbeing of patients particularly for those from social vulnerable communities.

This is supported by the fact that, 66% of the renal patient respondents at MPH are found to have skipped their scheduled treatment due to reasons that have to do with transportation services. Apart from prevalent cases of missed treatments, the implications of lack of this need include

exclusion from social and economic participation of the affected patients, safety risks, risks of worsening medical conditions, amongst others. The research study further finds that, unless provision of non-emergency patient transportation services are designed to meet the specific needs of patients to respond to their treatment requirements and operational system of the health providers, the objectives of universal access to health care remains incomplete, and that the current situation may in fact, serve to worsen the conditions of the patients, and that of transportation services providers and health care service providers.

While the qualitative research analysis identifies fifteen (15) major patient travel needs, at an intervention level, the research study finds that efforts that are aimed at alleviating the implications of this access barrier to accessibility to health should adopt a holistic approach as the patient travel factors possess a synergetic relationship, where a particular travel factor might have a positive or negative influence on the other/s. The research study further finds that transportation services is an important aspect of social and economic development, for which spatial developments should critically take into consideration to ensure improved quality of life of people, in this case being maintenance of their wellbeing.

In support of this view, while the IPA individually identify provision of readily available transportation services that are easily connected, dependable and reliable, and efficient, the IPA also identifies provision of a dedicated non-emergency renal transportation services as critical potential intervention needed to improve patient travel experiences. From interpretation interview discussions, this intervention, as a travel requirement, has the potential to address the majority of the critical patient travel needs from a holistic approach. Nonetheless, the research study finds that integration of other access factors to health such as health supply and demands factors, that includes human resources, medical equipment and provision of appropriately designed and sufficient physical infrastructures such as facilities of convenience, actual physical health facilities and universal access infrastructure are critical factors improving patient travel experiences, and subsequently to the improvement of accessibility to health care. Thus that patient travel phenomena is not only a function of provision of transportation services but is also a function of the capacities of institutions to deliver health care services.

5.3 Conclusions and Recommendations

In interpretation of the research findings and extant literature discussions, provision of effective and efficient non-emergency transportation services should be one of the key priorities of health care system transformation initiatives, particularly in view of the adoption of the National Health

Insurance Policy in the country. The overwhelming finding that the lack effective and efficient non-emergency patient transportation services is indeed a barrier to accessibility to renal treatment at MPH, and that a slight majority of patient respondents, 54% and 56% respectively, agree that the current operational interventions that include extension of treatment hours and scheduling of patients into treatment have improved their access to transportation services and access to renal treatment services, shows that this need requires to be urgently and effectively addressed in South Africa.

Given that the lack of transportation services was acknowledged by the Human Rights Commission of South Africa as one of the fundamental stumbling blocks to health care access, the introduction of the NHI in South Africa provides the opportunity to re-examine this relationship. While the research remain in-exhaustive in its nature, this research study advocates for the development of a robust and dedicated non-emergency patient transportation service in the country. In this regard, the following recommendations are made:

1. Provision of a compulsory and centralised funding program for the non-emergency patient transportation services as short-to medium-term intervention.
2. Engagement with various transportations to improve capacity, availability, accessibility, dependability and reliability and efficiency of transportation services, and upgrading of physical health facilities to include provision for sufficient and appropriate facilities of conveniences as medium to long term interventions
3. Collaborative planning between the various health care service providers, built environment professionals and other professional viewed as relevant to the provision of effective and efficient non-emergency patient transportation services. This provides the trans- and interdisciplinary approach that is advocated by the discourse on accessibility to health care and the holistic nature of patient travel experiences

Overarching these recommendations will be the development of the non-emergency patient transportation act that guides the operational and quality assurance of the non-emergency transportation services. However, prior to the actual design of services, more research is needed to guide such, particularly in view of the fact that many of the patient travelling factors were found to act in a systematic and interrelated way to influence access to transportation services and timely access to health care services. Through a multi-stakeholder consultative approach, this research study therefore identifies the following research opportunities required to advance the incorporation of patient needs in transportation service design.

1. How should the disciplines of transport planning and health practitioners work together to improve designing of transportation systems to include considerations and provision of an effective and efficient non-emergency patient transportation services in South Africa?
2. What is the typology of needs for different patient treatment types, and how should transport services be designed to cater for these needs?
3. How much would it cost the NHI to explicitly cater for non-emergency patient transportation?
4. Should non-emergency transportation be incorporated in South Africa's transportation subsidy policy, or should different payment mechanisms be used?
5. How should service providers for non-emergency transportation services be contracted?
6. NHI promotes the use of health facilities closest to where patients live. However, specialised health care services are not always readily available in close proximity. How should the uneven spatial distribution of specialised services be taken into account by NHI?
7. How should the sustainability of non-emergency transportation provision under NHI be measured?

In the longer term, methods of incorporating health care in the spatial transformation agenda should receive priority.

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Annexure A: Faculty of Engineering and the Built Environment, University of Cape Town, Application for Ethics Approval in Research (EiR) form

Application for Approval of Ethics in Research (EiR) Projects
Faculty of Engineering and the Built Environment, University of Cape Town

APPLICATION FORM


Please Note:


Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analyzing data. The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the EBE Ethics in Research Handbook (available from the UCT EBE, Research Ethics website) prior to completing this application form: <http://www.ebe.uct.ac.za/usr/ebe/research/ethics.pdf>

APPLICANT'S DETAILS		
Name of principal researcher, student or external applicant	TAURAI MUBAWA	
Department	CIVIL ENGINEERING	
Preferred email address of applicant:	mubaiwat@gmail.com	
If a Student	Your Degree: e.g., MSc, PhD, etc.,	MPhil Urban Infrastructure Design and Management
	Name of Supervisor (if supervised):	Dr M. Mokonyama ; Prof Roger Behrens (Internal UCT Supervisor)
If this is a research contract, indicate the source of funding/sponsorship	N/A	
Project Title	Integrating Urban Public Transportation into South Africa's Health Care System Identifying, Defining and Understanding Public Transportation needs for Patients on repeated treatment for Chronic Kidney Disease. (A Case of Mafikeng Provincial Hospital)	


I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

SIGNED BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	TAURAI MUBAWA		10 Feb 2017

APPLICATION APPROVED BY	Full name	Signature	Date
Supervisor (where applicable)	DR. MATHETHA MOKONYAMA		20/2/2017
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all			

Application for Approval of Ethics in Research (EIR) Projects
Faculty of Engineering and the Built Environment, University of Cape Town

questions in Section1; and for all Undergraduate research (Including Honours).			
Chair : Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above questions.	G. Sithole		26/03/2017

Annexure B: Approval of Ethical Clearance from the University of Cape Town



Faculty of Engineering & the Built Environment

University of Cape Town
Private Bag X3, Rondebosch 7701
6th Level Menzies Building, Upper Campus
Dean: Professor AE Lewis Faculty Manager: Gita Valodia
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Engineering and the Built Environment Faculty Ethics in Research Committee

24 May 2017

Ethics Number (EN)/ Reference Number: EBE10021701

Dear Mr Taurai Mubaiwa

PROJECT TITLE: INTEGRATING URBAN PUBLIC TRANSPORTATION INTO SOUTH AFRICA'S HEALTH CARE SYSTEM (Identifying, Defining and Understanding Public Transportation needs for Patients on repeated treatment for Chronic Kidney Disease. (A Case of Mafikeng Provincial Hospital))

This letter serves to confirm that Mr Taurai Mubaiwa (Student number MBWTAU001) has obtained ethical clearance approval for his/her Masters research titled as indicated above. The application has been assessed and found to be consistent with the ethics policies of the University of Cape Town.

The application has been approved on the following conditions:

1. That the research is limited to the interview of participants for the purpose of studying their transport needs and,
2. That the consent of individual participants will be obtained.
3. That the approval does not extend to any questions that are related to the health or treatment of participants.

The approval is granted for a period of twelve months as follows:

Date of Assessment : 10 February 2017
Date of Approval : 27 March 2017
Date of Expiry : 27 March 2018

Please note that the on-going ethical conduct of the study remains the responsibility of the principal investigator.

Yours sincerely

A handwritten signature in black ink, appearing to be 'G Sithole'.

Dr George Sithole
Ethics in Research Committee Chair
Engineering and the Built Environment Faculty

Annexure C: Approval of Ethical Clearance from North West Department of Health

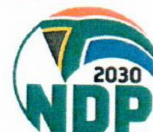


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POLICY, PLANNING, RESEARCH, MONITORING AND EVALUATION

Name of researcher : **Mr. T. Mubaiwa**
University of Cape Town

Physical Address (Work/ Institution) : 424 PROTEA GLEN, NEWLANDS, 7708
NW. DoH
MAFIKENG
2745

Subject : **Integrating urban public transportation in South Africa's health Care System identifying, defining and understanding public transportation needs for patients on repeated treatment for chronic kidney disease: A case of Mafikeng Provincial Hospital.**

This letter serves to inform the Researcher that permission to undertake the above mentioned study has been granted by the North West Department of Health. The Researcher is expected to arrange in advance with the chosen facilities, and issue this letter as proof that permission has been granted by the Provincial office.

This letter of permission should be signed and a copy returned to the department. By signing, the Researcher agrees, binds him/herself and undertakes to furnish the Department with an electronic copy of the final research report. Alternatively, the Researcher can also provide the Department with electronic summary highlighting recommendations that will assist the department in its planning to improve some of its services where possible. Through this the Researcher will not only contribute to the academic body of knowledge but also contributes towards the bettering of health care services and thus the overall health of citizens in the North West Province.

Kindest regards,


Dr. FRM Reichel
Director: PPRM&E



26/05/2017
Date


Healthy Living for All



Annexure D: Approval of Ethical Clearance from Mafikeng Provincial Hospital



404 Protea Glen
Glenhoff Street
Newlands
7708
Cape Town

23 June 2017

RE : INTEGRATING URBAN PUBLIC TRANSPORTATION INTO SOUTH AFRICA'S HEALTH CARE SYSTEM (Identifying, Defining and Understating Public Transportation needs for Patients on repeated treatment for renal failure Disease. (A Case of Mafikeng Provincial Hospital))

Dear Mr. T Mubaiwa

This letter serves to inform you that permission to carry out research with Mafikeng Provincial Hospital for the above titled research project is granted. You are expected to arrange with the Head of Renal Unit in advance for the data collection processes and preparation of the schedule of meetings or interviews. You are also expected to furnish Mafikeng Provincial Hospital with a copy of the final research report.

We wish you the best in your research endeavors.

Yours Sincerely

Ms Johanna Elize Taljaard
CEO (MPH)



Healthy Living for All

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Annexure E: Stage 1 Qualitative Research Analysis Questionnaire

Faculty of Engineering and the Built Environment
Department of Civil Engineering

Stage 1: Research Consent Forms

FULL TITLE OF PROJECT

Integrating Urban Public Transportation into South Africa's Health care System

Identifying, Defining and Understanding Public Transport needs for Patients on repeated treatment for Chronic Kidney Disease. (A Case of Mafikeng Provincial Hospital)

DETAILS OF THE RESEACHER

Name : Taurai Mubaiwa
Position : Postgraduate Student
Programme of Study : MPhil, Urban Infrastructure Design & Management
Contact address of Researcher : 404 Protea Glen,
Glenhoff Street,
Newlands,
Cape Town
7708

CONSENT STATEMENT

Good day, my name is **Taurai Mubaiwa**. I am from the Department of Civil Engineering at the University of Cape Town. I am studying towards a Master of Philosophy Degree in Urban Infrastructure Design and Management. I am doing this research under the broader objective of functionally integrating urban public transport and South Africa's health care system.

I am studying patients travelling to health facilities in order to understand non-emergency patient transport service requirements, and how these requirements can be incorporated into the National Health Insurance Policy, where appropriate.

I would like to discuss issues related to this research topic with you. All the information from this discussion will not be linked to your personal identity. This interview will probably take about 30 minutes. You are at liberty to refuse to participate completely in this interview. You are also at liberty to refuse answering any of the questions. The interview will be audio-recorded for proper analysis at a later stage.

Consent Statement	Initial in Box
1. I confirm that I have read and understand the information in this consent form and have had the opportunity to ask questions.	
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason.	
3. I agree to take part in the above study.	
4. I agree to the interview being audio-recorded.	
5. I agree to the use of anonymised quotes in publications.	

Name of Participant
(For persons 18yrs or older)

Date

Signature

TAURAI MUBAIWA

Name of Researcher

Date

Signature

RESEARCHER'S DETAILS AND CONTACT INFORMATION

Name : Taurai Mubaiwa

Position : Postgraduate Student

Program of Study : MPhil, Urban Infrastructure Design & Management

Contact address of Researcher : 404 Protea Glen,
Glenhoff Street,
Newlands,
Cape Town
7708

Email address : mubaiwat@gmail.com

Contact numbers : +27 60 425 0287

Semi-Structured Open-ended Questionnaire

Questionnaire (01) Open-ended Questionnaire (Patient Level)
DEMOGRAPHY
Gender :
Age :
Home location (Suburb and Province) :
1. From your recollection of today's activities, how did you prepare for your journey to the hospital?
2. When you finished your preparations, how did you travel to the hospital?
2.1 What type of transport do you use for your journey?
2.2 How do you access the transport to the hospital?
2.3 How do you pay for your transport?
2.4 How much did you pay for the transport service?
2.5 How often do you travel to the clinic?
2.6 If the transport you used today was not available, how else would you have travelled to the hospital?
2.7 Are there any other activities that you have engaged or will engage in as part of this journey today?
3. Thinking about your way back home, how will you travel from the hospital to your home?
3.1 What time do you expect to leave the hospital to go back home?
3.2 What type of transport will you use?
3.3 If that transport is not available, how else will you travel to the hospital?
3.4 Are there any other activities that you will engage in on your journey back home?
4. Has anything in your life changed since you started travelling for your treatment?
4.1 If yes, what has changed?
4.2 In what ways do these changes affect your life?
5. Thinking about the way you travelled today to the hospital, have you encountered any problems related to your journey to the hospital?
5.1 If any, how did you overcome these problems?
5.2 How often do you encounter these problems?
5.3 In your opinion, in what way should the hospital assist in overcoming these challenges?

5.4 Are there any other potential challenges that you can think of?

6. In your opinion, is there anything that could be done to make your journey for your treatment easier?

Questionnaire (02): Open-ended Questionnaire (Physician/Doctor Level).

1.0 From your experience, are there any specific travel-related issues that have been raised by your patients?

1.1 What are the most common and less common issues that are often raised by your patients?

1.2 In your opinion, in what ways could these issues be addressed?

1.3 What interventions have been previously implemented that worked?

1.4 What interventions have been previously implemented that did not work?

Questionnaire (03) : Open-ended Questionnaire (Hospital Management Level)

1. In your opinion, how do travel-related issues impact on the treatment of patients with chronic diseases?

2. Have you received any travel-related complaints from patients on regular treatment for chronic diseases?

3. How prevalent are transport-related cases of missed treatment schedule for patients undergoing regular treatment for chronic diseases?

4. In what way does the hospital address transport-related cases of missed treatment, if any?

Questionnaire (04) Open-ended Questionnaire (Transportation Service provider)

1. In your opinion, how does the service you provide to the hospital differ from any other service on other routes?

2. In your opinion, how do the passengers that you transport on the hospital route, differ from other passengers?

3. Are there any special arrangements that you make with people who come regularly for treatments?

3.1 If not, why not, if yes, what are these arrangements?

Annexure F: Stage 2 Quantitative research analysis questionnaire

Department of Civil Engineering

Stage 2: Research Consent Form

FULL TITLE OF PROJECT

Integrating Urban Public Transport into South Africa's Health care System

Identifying, Defining and Understanding Public Transport needs for Patients on repeated treatment for Chronic Kidney Disease. (A Case of Mafikeng Provincial Hospital)

DETAILS OF THE RESEACHER

Name : Taurai Mubaiwa
Position : Postgraduate Student
Program of Study : MPhil, Urban Infrastructure Design & Management
Contact address of Researcher : 404 Protea Glen,
Glenhoff Street,
Newlands,
Cape Town
7708

CONSENT STATEMENT

My name is **Taurai Mubaiwa**. I am from the Department of Civil Engineering at the University of Cape Town. I am studying towards a Master of Philosophy Degree in Urban Infrastructure Design and Management. I am doing this research under the broader objective of functionally integrating urban public transport and South Africa's health care system. I would be grateful if you could help me in answering the questions contained in the attached questionnaire.

All information you provide will not be linked to your personal identity. You are at liberty to refuse to participate completely in this survey. You are also at liberty to refuse answering any of the questions. Responses to the questions in this questionnaire will be analysed in detail at a later stage.

Consent Statement	Please Initial Box
I confirm that I have read and understand the information in this consent form and have had the opportunity to ask questions.	
I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason.	
I agree to take part in the above study.	
I agree to the use of anonymised quotes in publications	

Name of Participant _____ Date _____ Signature _____
(For persons 18yrs or older)

TAURAI MUBAIWA

Name of Researcher _____ Date _____ Signature _____

RESEARCHER'S DETAILS AND CONTACT INFORMATION

Name : Taurai Mubaiwa
Position : Postgraduate Student
Program of Study : MPhil, Urban Infrastructure Design & Management
Contact address of Researcher : 404 Protea Glen,
Glenhoff Street,
Newlands,
Cape Town
7708
Email address : mubaiwat@gmail.com
Contact numbers : +27 60 425 027

(2a) Structured Open-ended Questionnaire (Self Completed)

NOTE: Based on the research design for this study, the content of the research questionnaire may be amended on the basis of the findings from Stage 01.

Put a cross (X) on your choice of answer.

DEMOGRAPHY								
Gender :								
Age :								
Place of Residence (Suburb, Province) :								
Modes of transport used in order (e.g. walked, taxi, bus, walked) :								
Total amount paid for one-way journey to hospital (Rand) :								
STATEMENT		SCORE						
		1	2	3	4	5		
1(a)	Form the time I started travelling for my treatment, transport services from home to the hospital are readily available.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
1(b)	How important is it for you to have readily available transport from home to the hospital?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
2(a)	From the time I started travelling for my treatment, transport service from the hospital going back home is readily available.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
2(b)	How important is it for you to have readily available transport from the hospital to your home?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>

3(a)	I can easily walk the distance from my house to where I pick up my transport to the hospital	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
3(b)	How important is it for you to be able to easily walk to where you pick up your transport to the hospital?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
4(a)	The distance that I travel for my medical treatment is easily manageable	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
4(b)	How important is the distance from your home to the hospital to your travelling arrangements for medical treatment?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
5(a)	The transport services that I often use for my journey for medical treatment from my home to the hospital is dependable and reliable	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
5(b)	How important is it to you to have a dependable and reliable transport service from home to the hospital?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
6(a)	I can easily pay for my travelling costs for treatment without any problems	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
6(b)	How important is it for you to be able to pay for your travelling costs for treatment without any problem?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>

7(a)	I believe that part of the cost of transport for treatment should be covered by the hospital.	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly Agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
7(b)	How important is it for you to have part of your cost of travelling for treatment covered by the hospital?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
8(a)	I believe that all the costs of transport to the hospital for my treatment should be covered by the hospital	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
8(b)	How important is it for you to have all of your costs of transport for medical treatment covered by the hospital?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
9(a)	During my journey for medical treatment, the time that I take to travel from my home to the hospital is acceptable.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
9(b)	How important is it for you to travel from your home to the hospital within an acceptable time frame?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
10(a)	During my journey to the hospital for my treatment, I am able to connect easily with the transport services to travel from Mafikeng Town to Mafikeng Provincial Hospital.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
10(b)	How important is it to you to be able to easily connect with transport from	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>

	Mafikeng Town (CBD) to Mafikeng Provincial Hospital?							
11(a)	The type(s) of vehicle(s) that I often use for my travelling for treatment is suitable .	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
11(b)	How important is it to you to have a vehicle that is suitable for your travel for treatment?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
12(a)	The route that I use for my travelling for treatment has sufficient facilities of convenience necessary for my health, e.g. ablution facilities, information signs, etc.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
12(b)	How important is it for you to have sufficient facilities of convenience during your travel for treatment? E.g. ablution facilities, information signs.	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
13(a)	The facilities for convenience (e.g. waiting rooms/lounge, sleeping areas) provided by the hospital are appropriate	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
13(b)	How important is it for you to have appropriate facilities of convenience at the hospital during your travels for treatment?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
14(a)	I believe the hospital should provide transport that is designed for renal patients.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
14(b)	How important is it for you that the hospital provides transport that is dedicated for renal patients?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>

15(a)	I believe there should be transport that picks me up from my home when I travel to the hospital for treatment.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
15(b)	How important is it for you to be picked up from your home when you travel to the hospital for treatment?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
16(a)	I believe there should be transport that drops me off at my home when I travel for treatment from the hospital.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
16(b)	How important is it for you to be dropped off at your home when you travel from the hospital?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>
17(a)	It is necessary to have someone to assist me when I travel to the hospital for treatment.	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Refused to answer</i>	<i>Not applicable</i>
17(b)	How important is it for you to have someone to assist you when you travel to the hospital for treatment?	<i>Very unimportant</i>	<i>Unimportant</i>	<i>Neither important nor unimportant</i>	<i>Important</i>	<i>Very important</i>	<i>Refused to answer</i>	<i>Not applicable</i>

(2b) Demographic Questions (Closed-ended questions)

Put a cross (X) on your choice of answer.

STATEMENT		RESPONSE		
		Yes	No	Refused To Answer
18	I have previously skipped a scheduled hospital appointment because of reasons that have to do with transport.			
19	Extending treatment days to include weekends has made my travelling arrangements for treatment much easier.			
20	Grouping of patients into two treatments sessions has made my travelling arrangements to the hospital much easier.			

Annexure G: Demographic information of the selected renal dialysis patient respondents

Sample Group	Respondent ID Number	Gender		Age (years)	Place of residence	Province (North West)	Spatial Characteristic of place of residence	Approximated Distance travelled (km)	Planned transportation Services used	Cost of Travel (R)
		Male (M)	Female(F)							
		M	F							
AGE (21-30)	01	*		25	Montshioa	North West	Urban	5	Public Taxis	R40/day
	12	*		28	Kraaipan	North West	Rural	75	Planned Patient Transportation	R0
	15	*		31	Montshioa	North West	Urban	5	Pre-arranged Private car	R600/month
AGE (31-40yrs)	02	*		34	Majemantsho	North West	Rural (Peri-urban)	5	Public Taxis	R40/day
	06	*		40	Magogoe	North West	Rural (Peri-urban)	10	Public Taxis	R40/day
	10	*		34	Bodibe	North West	Rural	30	Planned Patient Transportation	R0
Age (>40yrs)	03	*		44	Ganalaagte	North West	Rural	85	Planned Patient Transportation	R0
	04		*	63	Lehurutshe	North West	Rural	80	Public Taxis	R24/day
	05	*		52	Ramosadi	North West	Rural (Peri-urban)	5	Planned Patient Transportation	R24/day
Distance Travelled (0-20km)	07	*		39	Montshioa	North West	Urban	5	Public Taxis	40/day
	08	*		55	Magogoe	North West	Rural (Peri-urban)	10	Public Taxis	40/day
	14	*		-		North West	-	10	Private Own Car	R840/month
Distance travelled : 20-50km	11	*		-	Lichtenburg	North West	Semi-Urban	70	Planned Patient Transportation	R40/day
	13	*		57	Zeerust	North West	Semi-Urban	70	Private Own Car	R200/week
	23	*		43	Verdawaal No2	North West	Semi-rural	50	Public Bus Services	R60/week
Distance travelled : >50km	17	*		43	Setlagole	North West	Rural	77	Planned Patient Transportation	R16/day
	20	*		33	Ganalaagte	North West	Rural	85	Planned Patient Transportation	R0
	24	*		35	Phadima Village	North West	Rural		Public Bus Services	R80/week
Gender : (Male)	16	*		60	Itsoseng	North West	Semi-Rural	47	Private Own Car	R150/day
	19	*		63	Ramathlabama	North West	Semi-Rural	34	Private Own Car	R800/month
	21	*		38	Sweding Village	North West	Semi-rural		Pre-arranged Car	R420/month
Gender (Female)	09		*	45	Top Village	North West	Rural (Peri-urban)	10	Public Taxis	R20/d
	18		*	54	Lichtenburg	North West	Semi-Urban	70	Planned Patient Transportation	R00/day
	22		*	50	Makhubung	North West	Rural	16	Public Taxis	R40/day