FACTORS INFLUENCING ENROLMENT OF DAIRY FARMERS TO A COMMUNITY HEALTH INSURANCE FOR BETTER ACCESS TO HEALTH CARE

by

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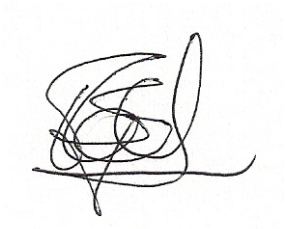
DECLARATION

I declare that **FACTORS INFLUENCING ENROLMENT OF DAIRY FARMERS TO A COMMUNITY HEALTH INSURANCE FOR BETTER ACCESS TO HEALTH CARE** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.



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14 December 2012 — **DATE**

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ABSTRACT

The purpose of this study was to describe factors that influence the enrolment of dairy farmers to a Community Health Insurance scheme for better access to healthcare. Quantitative, descriptive, contextual, cross-sectional research was conducted and the Health Insurance for the Poor framework was used to describe these factors. Data collection was done using a structured interview guide. The sample consisted of 135 farmers who supplied milk to a dairy cooperation in western Kenya. Among the sample were respondents (n=17) who were enrolled to the Tanykina Community Healthcare Plan (TCHP). The findings revealed that lack of information and unfamiliarity with TCHP, lack of affordability and the distance from the TCHP centres might prevent farmers from registering for the Tanykina Community Healthcare Plan. Improved marketing strategies and establishing more health centres which are more accessible are among the recommendation made to increase the membership to the TCHP.

Key concepts

Access; Community Health Insurance Scheme; dairy farmers; enrolment; Tanykina Community Healthcare Plan.

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List of abbreviations

AAR	African Air Rescue (local insurance company)
CHAT	Choosing Health Plans All Together
CHI	Community Health Insurance
HIF	Health Insurance Fund
HIP	Health Insurance for the Poor
HIS	Health Insurance Schemes
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
ILO	International Labour Office
KCBHFA	Kenya Community Based Health Financing Association
MDD	Medical Due Diligence
MIG	Member Information Gatherings
NGO	Non-governmental Organisation
NHIF	National Hospital Insurance Fund
NHIS	National Health Insurance Scheme
OR	Odds ratio
PharmAccess	PharmAccess Foundation
Sa	Sine anno (date unknown)
SES	Socio-economic status
SWOT	Strengths, weaknesses, opportunities and threats
TCHP	Tanykina Community Healthcare Plan
TDPL	Tanykina Dairy Plant Ltd
TFR	Total Fertility Rate
TNS	Taylor Nelson Sofres (global market research company)
UNAIDS	United Nations Joint Programme on HIV/AIDS
WHA	World Health Assembly
WTP	Willingness to pay
WHO	World Health Organization

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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Health systems financing is high on the agenda of the World Health Organization (WHO) due to the fact that, according to the World Health Report 2010, it is seen as the path to universal coverage (WHO 2010:5-13; Spaan, Mathijssen, Tromp, Mc Bain, Ten Have & Baltussen 2012:685, 690). Moreover, fair and sustainable financing structures can make a valuable contribution towards the health-related Millennium Development Goals, including Goal 4: Reducing child mortality; Goal 5: Improving maternal health; and Goal 6: Combatting HIV/AIDS, malaria and other diseases; as well as contributing towards Goal 1: Eradicating extreme poverty and hunger (Fryatt, Mills & Nordstrom 2010:419; WHO 2011:1). Access to affordable and effective healthcare is a challenge in low and middle-income countries, where the out-of-pocket expenditure for healthcare is a major cause of impoverishment. One way to facilitate access and overcome catastrophic expenditure is through a health insurance mechanism, whereby risks are shared and financial inputs pooled by way of contributions (Jacobs, Bigdeli, Van Pelt, Salze & Criel 2008:140).

An example of a health insurance mechanism is Community Health Insurance (CHI), which refers to voluntary health insurance schemes organised at community level. CHI is not a new concept, having emerged in developing countries in the second half of the 1980s as an attractive and powerful method to secure better access to health services and greater financial protection for poor populations (Carrin, Waelkens & Criel 2005:799, 800). Despite the evidence on the potential of CHI, enrolment in Sub-Saharan Africa remains low (De Allegri, Sauerborn, Kouyaté & Flessa 2009:586). The role of context for CHI development is emphasised by Criel, Atim, Basaza, Blaise and Waelkens (2004:1042). They recommend context-specific research in order to generate and fine-tune a theory that might explain how CHI in Sub-Saharan Africa functions.

This research used a quantitative approach to explore and describe factors that influence enrolment in the Tanykina Community Healthcare Plan (TCHP), an example of a CHI in Western Kenya.

1.2 SOURCE AND BACKGROUND OF THE RESEARCH PROBLEM

Brink, Van Der Walt and Van Rensburg (2006:59) describe a research problem as an area of concern in which there is a gap or a situation in need of solution, improvement or alteration, or in which there is a discrepancy between the ways things are and the way they ought to be.

1.2.1 Source of the research problem

From April 2011 the TCHP had been offered to members of Tanykina Dairy Plant Ltd (TDPL). On first inspection, the TCHP seemed to be a very well-constructed CHI, as it was evidence-based, as well as tailored to the needs of the community. A local insurance provider, African Air Rescue Health Services Ltd (AAR), manages the programme and is in charge of the administration of the enrolment figures. One and half years after the official launch of the programme, 477 members out of a monthly average of 3366 active TDPL members (along with their families), were enrolled in the TCHP. This meant an enrolment of 14% of the active membership of TDPL, which appeared too low to sustain a CHI system. The low enrolment figures triggered an interest to empirical investigate the situation. The question arose as to why the enrolment was so low, while the benefits seemed to be so attractive?

1.2.2 Background to the research problem

In 2005, the World Health Assembly (WHA) of the WHO adopted a resolution on sustainable health financing, universal coverage and social health insurance, indicating that health-financing systems in many countries needed to be further developed in order to guarantee access to health services. The WHA indicated the prepayment and pooling of resources and risks as basic principles in financial risk-protection; and noted that the choice of a health financing system should be made within the particular context of each country (WHO 2005:139). This resolution addressed a major problem in Africa, namely the out-of-pocket payments for healthcare services. Approximately 50% of healthcare is

paid out-of-pocket by patients, causing many to fall into a poverty trap (PharmAccess 2010a:7; Schellekens, Lindner, Lange & Van der Gaag 2008:2; WHO 2006c:178-184). It thus proves a challenge for people in this situation to move away from out-of-pocket payments towards some form of prepayment, and ultimately into universal coverage. It is in the transition process towards universal coverage that CHI plays a role of protecting as many people as possible (Carrin, Mathauer, Xu & Evans 2008:858, 860). There is strong evidence that CHI improves the mobilisation of resources for health and the utilisation of health services, and provides financial protection for members in terms of reducing their out-of-pocket expenditure (Spaan et al 2012:689). CHI thereby seems to offer an effective response to the problem of financial accessibility that people experience.

The last two decades have seen an apparent boom in CHI in Sub-Saharan Africa. In 2004 estimates already indicated the existence of approximately 900 schemes in Sub-Saharan Africa (De Allegri et al 2009:587). However, across Sub-Saharan Africa, CHI is beleaguered by low enrolment. Apart from a few isolated successes e.g. in Ghana and Rwanda, reviews consistently report enrolment rates between 1% and 10%. This low enrolment has become a source of interest for researchers (De Allegri et al 2009:590). The main focus of the research into CHI, according to De Allegri et al (2009:587), focuses on the impact of CHI on access of care, financial protection against the cost of illness, quality of care, and CHIs contribution to the performance of health financing systems. Spaan et al (2012:687) confirmed this, and add that there is little evidence of the impact of CHI on community empowerment, meaning the impact on social inclusion and utilisation patterns among vulnerable groups. De Allegri et al (2009:587-593) have conducted an analytical review of the existing literature on the major operational difficulties hampering CHI development in Sub-Saharan Africa. One of the five categories that emerged in their research was low enrolment rates. They thus recommended further research to investigate those issues that seem to discourage people from joining CHI. Spaan et al (2012:688) indicated that research is needed to explore the impact of CHI on community empowerment.

Ndiaye, Soors and Criel (2007:160) confirm that introducing health insurance in African societies, where household needs are multiple and pressing, and where insurance is altogether a new cultural concept, is a complex undertaking. They therefore recommend

more systematic, multi-country research on the causes that prevent people from enrolling in CHI. Then actions to be taken can be identified and tailored to each setting.

1.2.3 Background to the research setting

The TCHP was initiated by the Health Insurance Fund (HIF). The HIF aims to improve access to comprehensive healthcare by supporting the provision of health insurance to low and middle-income groups in several African countries. Besides offering affordable health insurance to low-income populations in Sub-Saharan Africa, an important component of the HIF programme is to improve the quality of healthcare services and to ensure compliance to international standards. The first group in Kenya to become eligible for a HIF funded CHI consisted of members of TDPL (Van der Gaag, Lange, Schultsz, Heidenrijk, Gustafsson-Wright, Hendriks, Bonfrer, Van der List, Páp, Brouwer, Te Pas, Rooijakkers, Boers & Duynhouwer 2011:10; PharmAccess 2010a:6-8) .

The TCHP was implemented among dairy farmers in Nandi North District, which falls under Nandi County in the North Rift Valley Province in Western Kenya. Figures 3.1 and 3.2 showed its geographical location. Nandi County consists of five districts, namely Nandi North, Nandi Central, Nandi South, Nandi East and Tinderet. The Kenyan Population Census 2009 estimated the population of Nandi County to be 750,000. The surface area of Nandi County is 2,884 km², with a population density of 261 people per km². Around 84% of the population live in rural areas (Kenya National Bureau of Statistics 2010a:32).

The uniqueness of the TCHP is that the community was involved in developing their own health insurance benefit package (see section 2.6.2.6.2) and that members can pay their premiums via their milk account at TDPL.

1.3 RESEARCH PROBLEM

The members of TDPL have been offered a CHI called the TCHP. The TCHP seeks to address a major problem amongst dairy farmers, namely the out-of-pocket payments for healthcare services. In Kenya, 36 % of healthcare is paid out-of-pocket by patients, causing many to fall into a poverty trap (Luoma, Doherty, Muchiri, Barasa, Hofler, Maniscalco, Ouma, Kirika & Maundu 2010:17). The challenge therefore is to move away

from out-of-pocket payments towards some form of pre-payment. The TCHP is designed to play a role in financially protecting as many people as possible towards healthcare provision (Carrin et al 2008:858, 860). Ekman (2004:256) confirms that the local context plays a crucial role in influencing enrolment in health insurance schemes.

Although the owner of TDPL, the implementer which is PharmAccess Foundation (PharmAccess) and the medical insurance provider AAR have done their best to involve the community and develop an attractive benefit package, as a resolution to improve healthcare access, there is an enrolment rate of a mere 14% of TDPL members.

The research problem could therefore be stated as follows: Although an attractive benefit package in assist dairy farmers to access healthcare exists, only a small percentage of dairy farmers enrolled to this scheme.

1.4 AIM OF THE STUDY

1.4.1 Research purpose

The purpose of this study was to investigate factors that influence the enrolment of dairy farmers in the health insurance scheme of the TCHP, which provides better access to healthcare. The research question was thus devised as follows: What are the factors that influence enrolment of dairy farmers in a CHI for better access to healthcare?

1.4.2 Research objectives

The objectives of the research were to:

- determine and describe factors that influence enrolment by dairy farmers in a CHI scheme for better access to healthcare
- generate evidence based information on factors that influence dairy farmers to enrol in an insurance scheme that can be used to make recommendations to the TCHP management on how to improve the CHI

1.5 SIGNIFICANCE OF THE STUDY

Undertaken within the Health Sciences, this study focused on health economics. Health economics is concerned with improving the level and distribution of population health utilising available resources (Wonderling, Gruen & Black 2005:18). The principle of CHI is based on the relation between health and available resources. This study generated knowledge on those factors that influence enrolment in a CHI by dairy farmers. The aim of health economics is often to inform decision makers so that the choices they make come to maximise health benefits for the population (Wonderling et al 2005:18). The knowledge that was generated from this study was used to make recommendations to the TCHP management on how to improve the TCHP. The beneficiaries of the study were the Tanykina dairy farmers, because improvement of the TCHP results in better access to healthcare for the community. In the broader perspective, the outcomes of this study can guide those who are involved in public health in the implementation of similar schemes in other comparable contexts (De Allegri, Sanon, Bridges & Sauerborn 2006:58-59).

1.6 DEFINITION OF KEY CONCEPTS

The conceptual and operational definition of the core constructs provided the researcher with connotative meanings and a clearer view of how they were applied throughout the study. The conceptual and operational definitions of the key concepts used in this study were as follows:

Access

Access refers to the right or privilege to approach, reach, enter, or make use of something (Collins English Dictionary 2009:Sv “access”).

In this study, access referred to the financial ability by local dairy farmers and their families to utilise healthcare services through use of the CHI.

Community Health Insurance scheme

Community Health Insurance (CHI) is understood in this study as a general term, used to refer to voluntary health insurance schemes organised at community level, that are alternatively known as mutual health organisations, medical aid societies, medical aid schemes or micro-insurance schemes (Criel et al 2004:1041).

Dairy farmers

A farmer is a self-employed person who operates or manages a farm. A dairy farm is a farm devoted chiefly for the production of milk (Random House Webster Unabridged Dictionary 2005:402).

In this study, a dairy farmer is taken as the owner of a dairy farm who supplied milk at TDPL on daily basis, due to the fact that only the owners of dairy farms are eligible for the TCHP. Focus was on a cooperative body of dairy farmers in West Kenya, namely TDPL, in the Nandi North District.

Enrolment

The Oxford Advanced Learner's Dictionary (2010:349) defines enrolment as an act of officially joining, or as a state of being enrolled, recorded or listed.

In this study, enrolment is taken as an act of officially joining a CHI, specifically the TCHP. Enrolment in the TCHP is only open to individuals who are members of TDPL, and their dependants. Enrolment is undertaken by completing the Activation Form, subsequent activation by AAR (the Medical Insurance Provider) and by the payment of the monthly premiums (TCHP 2011a:2). Members receive on joining the scheme, membership cards with pass photos which give them access to healthcare facilities.

Factor

The concept "factor" is defined by Collins English Dictionary (2009:403) as an element or cause that contributes to a result or outcome in a particular situation. Another definition states: something, e.g. a fact, which has to be taken into account or which

affects the course of events (Kernerman English Multilingual Dictionary 2010:Sv “factor”).

In this study, factor meant a particular element, situation, condition, circumstance, cause or fact that influences the enrolment of dairy farmers in a CHI.

Healthcare

Healthcare is defined as a total complex of preventative, remedial and therapeutic services provided by clinics, hospitals and other institutions, governmental and voluntary agencies, healthcare professionals, pharmaceutical, nursing and medical equipment manufacturers and government and private insurance funders (Potter & Perry 1995:1715). Other sources define healthcare as the prevention, treatment, and management of illness and the preservation of mental and physical wellbeing, through services offered by the medical and allied health professions (The American Heritage Medical Dictionary 2007:Sv “healthcare”). Good healthcare brings promotion and prevention, cure and care together, in a safe, effective and socially productive way, at the interface between the population and the health system (WHO 2008:41). In this study, healthcare refers to care provided by health professionals at the local healthcare facilities which are clinics and a hospital, to dairy farmers and their dependants, who have to pay the costs for the services either out of their pockets or through an insurance.

Influence

The Oxford Advanced Learner's Dictionary (2010:Sv “influence”) defines influence as the effect that somebody or something has on the way a person thinks or behaves or on the way that something works or develops.

In this study, influence means tissues, conditions and circumstances that lead to the enrolment or non-enrolment in the TCHP by dairy farmers.

Tanykina Community Healthcare Plan (TCHP)

The TCHP is a joint initiative between TDPL (owner), AAR (medical insurance provider) and PharmAccess (implementer) and was developed specifically to meet the healthcare needs of TDPL members and their families. The overall objective was formulated as follows: “TCHP is a member-driven healthcare plan which provides accessible, affordable and quality healthcare that supports the realisation of economic prosperity for farmers and their families” (PharmAccess 2010d:4, 12).

1.7 THEORETICAL FRAMEWORK

A framework is an abstract, logical structure of meaning that guides the development of a study and enables researchers to link the results to the scientific body of knowledge (Burns & Grove 2009:39). The theoretical base for this study was Bennett’s (2004:150-152) basic model, whose concepts were used to illustrate how a CHI scheme works. The Health Insurance for the Poor (HIP) framework was incorporated for further clarity on how CHIs facilitate poor communities’ to access healthcare. The concepts of these frameworks were utilised not only as a base of this research, but for guidance in data collection and analysis. Bennett’s model and the HIP framework were discussed in detail in chapter 2.

1.7.1 Meta-theoretical assumptions

Assumptions are basic principles that are considered to be true, based on logic and reason, without proof or verification (Polit & Beck 2012:12). Sources of assumptions include universally accepted truths, theories, previous research and nursing practices (Burns & Grove 2009:40). The following ontological, epistemological and methodological assumptions are embedded in the study design and the interpretation of the results:

Ontological assumptions

Ontology refers to the study of being or nature of reality (Polit & Beck 2012:13). Ontological assumptions regarding reality underlying this research were:

- CHI is a viable mechanism to increase access to healthcare if better understood and managed (Basaza, Criel & Van der Stuyft 2008:172).
- People have rational and understandable reasons for (not) joining a CHI.
- Universal coverage of healthcare depends on both public interventions in the form of social protection programmes, as well as private insurance initiatives (Jacobs et al 2008:140).

Epistemological assumptions

Epistemology in social science research refers to the nature of knowing. It focuses on the knowledge of social reality and the relationship between the inquirer and the unknown. It is a quest for truth (Polit & Beck 2012:13). Epistemological assumptions regarding this research were:

- Asking questions objectively through the use of a structured interview schedule which allowed the researcher to elicit an understanding of the factors that influences enrolment in a CHI.
- Lack of basic knowledge and information on design and operations of CHI leads to poor enrolment in the scheme.
- Humans differ in how they perceive and interpret issues in their environment.
- People find it a challenge to move from out-of-pocket payment to prepayment options.

Methodological assumptions

Methodological assumptions refer to the best means of obtaining evidence. The methodological dimension has to do with the steps, procedures and strategies for gathering and analysing data in a study (Polit & Beck 2012:13, 733). Methodological assumptions regarding this quantitative research were:

- Quantitative research provides more objective logical steps or empirical procedures than other modes of inquiry.
- Objective inquiry yields more reliable and valid research results than other subjective methods.

- Quantitative research incorporates deductive reasoning, which moves from the general to the specific, making accurate inferences to phenomena possible (Burns & Grove 2009:7).

Studies based on theoretical frameworks provide better guidance to empirical investigations. Burns and Grove (2009:37) conclude that assumptions are embedded (unrecognised) in thinking and behaviour, and uncovering these assumptions requires introspection and a strong knowledge base in the particular field of study.

1.8 RESEARCH DESIGN AND METHOD

According to Burns and Grove (2009:696), a research design is the blueprint for conducting a study that maximises control over factors that could interfere with the validity of the results. Research methods are the techniques, processes and procedures researchers use to structure a study, gather and analyse information relevant to the research question (Polit & Beck 2012:12). This section briefly described the research design and methodology which is described in detail in chapter 3 of this study.

This study followed a quantitative, explorative, descriptive, contextual and cross-sectional research design to explore and describe factors that influence the enrolment of dairy farmers into the health insurance scheme of the TCHP. Quantitative research is a formal, objective and systematic process in which numerical data is used to obtain information about the world (Burns & Grove 2009:22). The explorative and descriptive aspects of the research design assisted the researcher to investigate factors that influenced farmers to enrol or not to enrol in a CHI.

The population for this study were all the dairy farmers in Kenya. The target population were farmers that supplied milk to TDPL in Nandi North District. Convenience sampling was used to recruit a sample of 135 respondents. A structured interview schedule was used to generate information from the respondents in order to investigate factors that influence their enrolment into the TCHP. Data was collected with the help of three trained research assistants over a period of three days. A statistician was consulted for assistance on the use of STATA SE version 12, a statistical software computer package for data analysis using descriptive and inferential statistics. Exploratory factor analysis was used to reduce the multidimensionality of the data. Logistic regression was

conducted to predict the chance of enrolment in the TCHP. Analysis was done at a significance level of 5%, at a p value of 0.05 (at a 95% confidence level) and 1 degree of freedom. Face, content and construct, internal and external validity was ensured. Reliability test using the Cronbach's alpha was found to be 0.85. The three qualitative questions were analysed by means of content analysis.

1.8.1 Ethical considerations

Considerations were taken to ensure protection of the rights of the research institution, participants and to ensure scientific integrity.

Ethical clearance (Annexure A) was obtained from the Research and Ethics Committee of the Department of Health Studies at the University of South Africa (UNISA). This committee is legally mandated to objectively review research proposals on the merits and risks envisaged, and to make recommendations (Stommel & Wills 2004:384). This research took place under the authority of the management of TDPL. A letter was therefore sent to the management of TDPL to request permission to conduct the study (Annexure B). A letter of permission to conduct the study was thereafter obtained (Annexure C).

The researcher protected the rights of the respondents by obtaining a written, informed consent (Annexure D) from them after information on benefits and risks about the study were given. Anonymity, confidentiality, respect, dignity and privacy were also ensured. Respect for persons and their autonomy was realised by enabling respondents to withdraw from the study whenever they elected to do so, without threat of victimisation (Burns & Grove 2009:189-199).

The researcher adhered to the principles of scientific integrity by honestly reporting and communicating the purposes and intentions of the study, research methods and procedures and interpretations made. Study chapters were regularly submitted to the supervisors for rigorous supervision over a period of time for adherence to the rule of science. Accuracy in providing used references was maintained, and credit for the scholarly work of others was given to avoid plagiarism.

Details on ethical considerations were presented in chapter 3.

1.9 SCOPE AND LIMITATIONS OF THE STUDY

The study was conducted in one district in Kenya. The study was limited to the dairy farmers of the one district. The sample size of 135 respondents was inadequate a size for quantitative studies to ensure external validity and to generalise the findings. Use of a convenience sample could have compromised objectivity and internal validity. Use of research assistants to write up information on the interview schedule might have had room for discrepancy and accurate recording of the responses.

1.10 STRUCTURE OF THE DISSERTATION

The dissertation was organised according to the five chapters as shown in table 1.1.

Table 1.1 Structure of the dissertation

CHAPTER	TITLE	CONTENT DISCRIPTION
1	Orientation to the study	Overview of the research problem, purpose, objectives and significance of the study. Introduction of the theoretical framework, research design and method. Validity, reliability and ethical considerations were introduced.
2	Literature review	An in-depth review on the literature related to the topic under investigation and the description of the theoretical framework.
3	Research design and methodology	The overall plan for addressing the research problem, objectives, data collection and analysis methods, ensuring validity and reliability including ethical considerations.
4	Data presentation and analysis	Presentation, analysis and interpretation of the research findings.
5	Conclusion and recommendations	Discussions, conclusions and recommendations based on the research findings.

1.11 CONCLUSION

This chapter gave introductory information regarding the overall orientation of the study. The overview of the study, background information to the research problem, the research purpose, research question, objectives and significance of the study was introduced.

Definition of key concepts was provided. The theoretical framework, meta-theoretical assumptions, research design and methods were introduced. The chapter concluded with an overview of the ethical aspects, scope and limitations, and an overview of the structure of this dissertation.

Chapter 2 presented an in-depth literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents a review of relevant literature in order to generate an understanding of what was known about CHI and the knowledge gap that existed.

A literature review is an organised critique of the important scholarly literature that supports a study, and is a key step in the research process (LoBiondo-Wood & Haber 2006:79). According to LoBiondo-Wood and Haber (2006:80), the major goal of a literature review is to develop a strong knowledge base upon which to carry out research and other scholarly and educational activities and clinical practice. A literature review is aimed at contributing to a clearer understanding of the nature and meaning of the problem that has been identified (Fouché & Delport 2005:127). According to Stommel and Wills (2004:339), the key sources of a literature review from varied data bases include published literature, such as journal articles, peer reviewed articles, text books, reports, web sites, other media, as well as personal communications and other unpublished data.

Within the Health Sciences, CHI incorporates issues on health economics. For this reason, the relation of CHI to health economics has been described. Community health insurance was explained and evidenced-based factors that influence enrolment to CHI in less developed countries were also described. However, this research focused on enrolment factors in a CHI by dairy farmers in Kenya, and for that reason the health insurance situation of Kenya more broadly, was illustrated. Bennett's (2004) model and the HIP theoretical framework was elaborated on and functioned to describe the TCHP according to objectives, stakeholders and the health insurance action cycle.

2.2 HEALTH ECONOMICS

Health economics is concerned with improving the level and distribution of population health with the resources available (Wonderling et al 2005:18). From a public health point of view, health economics is one of the disciplines that may be used to analyse issues of health and healthcare (Greβ & Hessel 2008:565). Morris, Devlin and Parkin (2007:2) define health economics as the application of economic theory, models and empirical techniques to the analysis of decision-making by individuals, healthcare providers and governments, with respect to health and healthcare. The market for healthcare can be divided into supply and demand, respectively. The supply side includes factors derived from the healthcare production function that interact to produce effective healthcare services. The demand side is influenced by factors that determine whether an individual identifies disease, sickness, illness or injury and is willing and able to seek appropriate healthcare (Preker & Langenbruner 2005:340).

Health economics covers different financial aspects such as access to healthcare, out-of-pocket health payment, health finance reforms, universal financial coverage for healthcare and models of healthcare finance.

2.2.1 Access to healthcare

Access to quality healthcare is one of the important determinants of sound health outcomes in a population. There are many definitions of access to health services, with most researchers recognising that access is related to the timely use of services according to need (Peters, Garg, Bloom, Walker, Brieger & Rahman 2008:162). However the precise meaning of access to health care often remains unclear. McIntyre, Thiede and Birch (2009:181) therefore developed a conceptual framework that defines access to health care as the empowerment of an individual to use health care. In this definition access is not a passive concept but relates to the communicative interaction between individuals and the health care system. This concept is based on three dimensions:

- Availability: including the location of the facility, the physical access, transport services and the hours of service.

- Affordability: this encompasses financial access such as formal consultation fees, the cost of medicine, transport fees, lost of income to visit the health care provider.
- Acceptability: covers cultural access (McIntyre et al 2009:183,184).

Interactions between these dimensions of access as well as the distinction between supply and demand determine the level of access to care (McIntyre et al 2009:188; Peters et al 2008:162).

Health insurance is considered and promoted as the major financing mechanism that improves financial access to health services, which comprises one dimension of access to health care (Wang, Switlick, Ortiz, Connor & Zurita 2010:1). The contribution of health insurance to access to care was assessed by Wagner, Graves, Reiss, LeCates, Zhang and Ross-Degnan (2011:154). They conclude that households in which members were insured were more likely to have access to health care and less likely to be burdened by health care expenditures than households without insurance. Therefore health insurance coverage can increase access to health care (Wagner et al 2011:157). Nevertheless financial access is not restricted to health insurance coverage only. Affordability also depends on the ability to pay:

- other direct costs associated with transportation, special diets and child care
- indirect costs such as lost income or productivity while travelling to and from, and waiting to be seen by, a health care provider (McIntyre et al 2009:186)

To improve access policy makers should consider the broad conceptual framework of access to health care (McIntyre et al 2009:191) as discussed above.

2.2.2 Out-of-pocket health payment

Out-of-pocket payment is payment made by a patient on the use of health services (Normand & Thomas 2009:153). The lower the country income level, the higher the tendency of the out-of-pocket payments (Mills 2011:32). In countries with less resources, out-of-pocket payment is the major health financing mechanism, posing an enormous burden on underprivileged households (Mondal, Kanjilal, Peters & Lucas 2010:3). In Sub-Saharan Africa, approximately 50% of healthcare is paid out-of-pocket

(PharmAccess 2010a:7). Leive and Xu (2008:851), in their study on health expenditure in 15 Sub-Saharan African countries, concluded that around 30% of out-of-pocket health payments are financed by borrowing and selling assets. Health shocks, defined as unpredictable illnesses that diminish health status, were among the most important factors associated with poverty in this context. When households faced health shocks, that were exacerbated by out-of-pocket health payment, they were often also affected by income loss from inability to work (Leive & Xu 2008:849). The International Labour Office (ILO) rightly posited that there is a close link between health, the labour market and income generation, which together have an impact on economic growth and development. The WHO together with the ILO therefore combined their efforts in Social Health Protection to combat poverty and poor health conditions (ILO 2008:1).

2.2.3 Health finance reforms

Financial accessibility and the means of paying for healthcare is a worldwide concern. During the last decades, the finances of global health services have been significantly affected by various reforms. Though the motives and types of reform may differ per country, these reforms have the following in common:

- separation of purchaser and provider responsibility
- re-definition of the role of the state in responsibility for healthcare
- encouragement of the private sector and competition between providers
- search for alternative sources of funding (Wonderling et al 2005:168)

In the search for alternative sources of funding and in the transition process towards universal coverage, CHI becomes the solution for low-income countries in the attempt to protect as many people as possible against health risks (Carrin et al 2008:858-860).

2.2.4 Universal financial coverage for healthcare

International Labour Office defines coverage in relation to financial access to healthcare as the extension of social health protection with respect to the size of the population that, in case of need, can access health services that are financed through a risk pooling mechanism. This is done in such a way that the amount of healthcare costs borne out-of-pocket does not pose a barrier to access or result in service of limited

quality (ILO 2008:16). The importance of “Health for All” and the involvement of the community in health financing were already recognised more than 30 years ago by the Alma-Ata Declaration in Geneva (WHO 1978:1-2). The WHA of 2011 urged that the aim be adopted for affordable universal coverage and access of healthcare. To ensure affordable universal coverage, a method for pre-payment should be in place, as well as a mechanism to pool risks among the population in order to avoiding catastrophic healthcare expenditure and impoverishment as a result of seeking the care needed (WHO 2011a:2). The World Health Report 2010 considered three fundamental, interrelated challenges that restrict countries from moving closer to universal coverage. The first fundamental challenge is the availability of human, financial and material resources; the second is an overreliance on direct payments at the time people need care; while the third is the inefficient and inequitable use of resources (WHO 2010:9). This study related most directly to the second obstacle. The obligation to pay directly for services at the moment of need prevents millions of people receiving healthcare when they need it (WHO 2010:9).

2.2.5 Models of healthcare finance

Two models that are often referred to in connection with attempts to ensure universal healthcare coverage are the Bismarck model, which is based on compulsory social health insurance, and the Beveridge model, based on tax-funded services (Wonderling et al 2005:166). Many low-income countries experience difficulties in achieving universal financial protection. A tax-funded health system is difficult to develop, due to the lack of institutional capacity to effectively collect taxes. When it comes to social health insurance, it is very difficult to reach a nationwide consensus between various partners to accept a basic set of rules to govern social health insurance. These rules apply specifically to the decision whether or not to provide similar health service benefits to those with similar healthcare needs, regardless of the level of contributions that were made. This problem is worsened when countries have a significant inequality of incomes and assets amongst the members of its population. In addition, governments may simply not yet have the necessary infrastructure to organise a nationwide social health insurance. There are in addition factors of poor political stability, routinely linked to economic insecurity that interferes with the steady development of the health sector (Carrin et al 2005:799-800; Lautier 2003:57).

2.3 COMMUNITY HEALTH INSURANCE

Community Health Insurance is a general term for voluntary health insurance schemes organised at community level, that are alternatively known as mutual health organisations, medical aid societies, medical aid schemes or micro-insurance schemes (Criel et al 2004:1041).

2.3.1 Characteristics of a CHI

In theory, there are five characteristics that CHI schemes all share:

- solidarity, where risk-sharing is as inclusive as possible and membership premiums are independent of individual health risks
- community-based social dynamics, where the schemes are organised by and for individuals who share common characteristics such as geographical, occupational, ethnic, religious and gender
- participatory decision-making and management
- non-profit character
- voluntary participation (International Encyclopedia of Public Health 2008:782)

Community health insurance is not a new concept, but has emerged in developing countries in the second half of the 1980s as an attractive and powerful method to obtain better access to health services and to secure greater financial protection to poor populations (Carrin et al 2005:799-800). In 2004, estimates indicated the existence of approximately 900 schemes in Sub-Saharan Africa (De Allegri et al 2009:587). However, across Sub-Saharan Africa, CHI suffers from the problem of low enrolment. Apart from a few isolated successes e.g. in Ghana and Rwanda, reviews consistently report enrolment rates between 1% and 10% (De Allegri et al 2009:590; Kalk, Groos, Karasi & Girrbach 2010:94; Jehu-Appiah, Aryeetey, Agyepong, Spaan & Baltussen 2012:223). Unfortunately CHI is not an option for the poorest, or in other words, those that are not able to pay a premium (Ekman 2004:256; Jacobs et al 2008:140). The main threats for the financial sustainability of CHI as described by Ouimet, Fournier, Diop and Haddad (2007:341) are:

- adverse selection, where high-risk or sick individuals are more likely to enrol in health insurance than the low-risk or healthy individuals (Parmar, Souares, De Allegri, Savadago & Sauerborn 2012:1)
- over prescription of healthcare services or drugs to CHI members
- moral hazard, defined by a situation where consumers do not bear the direct cost of services and are encouraged to behave in a way which increases the use of those services, for example, they may take risks or fail to take preventative measures if they know that the CHI will pay for all future treatment (Walley & Wright 2010:92)
- fraud and abuse by both patients and service providers
- catastrophic expenses

The major challenge for CHI is how to secure greater equity across socio-economic groups, in terms of enrolment and access to health services (De Allegri & Sauerborn 2007:1282).

2.4 FACTORS THAT INFLUENCE ENROLMENT IN A CHI

In their analytical review of existing literature on CHI, De Alegri et al (2009:587) consider low enrolment as one of the difficulties hampering its successful development. In earlier studies by Ekman (2004:256), a range of factors that influence CHI enrolment were identified, differing by context and situation (Ekman 2004:256). For the purpose of this study, as identified in literature these factors were categorised as: dimensions, associated factors, barriers to enrolment, preferences of consumers and dropout analysis. The factors identified were also used to develop the interview schedule.

2.4.1 Dimensions

Criel et al (2004:1041-1043) indicate various factors that influence CHI enrolment and categorise them in five key dimensions:

- The political dimension, referring to the extent healthcare financing is a political concern and priority.

- The economic dimension, related to the financial ability of households to pay a contribution to a CHI.
- The social dimension, pointing to the social fabric and the level of trust in a community, which seems to be crucial for a successful implementation of CHI.
- The quality dimension, which refers to the perceived quality of care and the willingness of healthcare providers to improve on quality.
- The managerial dimension, which refers to the capacity of the managerial structure to deal with the complexity of CHI.

The political dimension is explored in this literature review under section 2.5. The other dimensions were covered in the interview schedule. Baltussen, Bruce, Rhodes, Narh-Bana and Agyepong (2006:654-657) with their survey among 45 private and public mutual health organisations, which is a synonym for CHI, in Ghana indicate that autonomy in decision-making and community participation are important dimensions to the success of CHI. The dimension of community participation can be linked to the social dimension that Criel et al (2004:1042) identify. Baltussen et al (2006:654) further expound that CHIs emerge as social networks based on solidarity and trust, manage to attract and retain clients.

2.4.2 Associated factors

In Burkina Faso, a population-based case-control study was conducted by De Allegri, Kouyaté, Becher, Gbangou, Pokhrel, Sanon and Sauerborn (2006a:853) on factors associated with decisions to enrol in a CHI scheme. This study revealed that enrolment in CHI was positively associated with: ethnicity; education; socio-economic status (SES); perception of traditional care; number of children; and distance from the health facility. The results of the study revealed that there was no evidence that household health status or the utilisation of prior health service influenced enrolment (De Allegri et al 2006a:856). It was confirmed by a literature review undertaken by Jehu-Appiah et al (2012:223) that a range of determinants known to influence enrolment are related to or associated with demographic and socio-economic characteristics (Basaza, Criel & Van der Stuyft 2008:181; Ndiaye et al 2007:160). A household survey among 3070 households in Nigeria investigated whether SES and place of residence influenced the willingness to pay (WTP) for CHI (Onwukjekwe, Okereke, Onoka, Uzochukwu, Kirigia & Petu 2010a:156). The conclusion was that SES and place of residence, amongst other

factors, significantly influence the WTP. The proportion of people who were willing to pay was much lower in rural communities than in urban communities. The higher the SES group, the higher the stated WTP amount. The finding that SES was a determining factor for WTP, may imply that CHI could end up providing services for those groups who are better-off and are willing to pay heavy premiums (Onwukjekwe et al 2010a:159-161). This 'exclusion' effect has been noted in many CHI schemes in low-income settings (Ekman 2004:252).

Jehu-Appiah et al (2012:224) conducted a quantitative survey on perceptions of 3301 households and the implications of these perceptions on enrolment in the National Health Insurance Scheme (NHIS) in Ghana. The study demonstrated that factors such as benefits, convenience and price, have the strongest influence upon enrolment and remaining enrolled in the health insurance scheme. They reported that the households that were positive about the quality of care, the benefit package and the convenience of administration, were meanwhile negative about the price, provider attitudes and peer pressure. Community "health beliefs and attitudes" rated positively, in the sense that households showed a good understanding of the principles and the risk sharing concepts of insurance and health. The uninsured were more negative than the insured about benefits, convenience and price of the insurance (Jehu-Appiah et al 2012:227-231). On the same NHIS in Ghana, a household survey among 7223 households was conducted to explore the association between SES and health insurance subscription to the NHIS (Sarpong, Loag, Fobil, Meyer, Adu-Sarkodie, May & Schwarz 2010:192). Thirty eight percent of the surveyed households, subscribed to the NHIS. Sarpong et al (2010:195) concluded that NHIS subscription was strongly associated with economic wellbeing. Only 21% of poor households with a low SES were enrolled into the NHIS, compared to 60% of those households enrolled who classified as high SES. A quantitative study among approximately 23,000 households in urban slums in Kenya showed that predictions for participation in a public health insurance programme included: employment; participation in social welfare programmes; participation in microfinance institutions and informal community-based saving groups; and being female. However, being poor, formerly married or never having been married were associated with a lower likelihood of participation in a public health insurance programme (Kimani, Ettarh, Kyobutungi, Mberu & Muindi 2012:5). Since enrolment in CHI is associated with socio-demographic characteristics, the following variables were captured in the interview schedule: gender; age; education; marital status; number of

children; SES measured by milk supply; other sources of income; and distance to the health facility.

2.4.3 Barriers to enrolment

In their qualitative research in Burkina Faso, De Allegri, Sanon and Sauerborn (2006c:1522-1544) explored barriers to enrolment. They noted affordability; distance to health facility; perception of the quality of care; healthcare seeking behaviour; cultural beliefs and practices; sceptism and trust, as barriers to enrolment. In a qualitative study in Uganda conducted by Basaza et al (2008:172), they identified barriers to low enrolment at both the demand and supply side of healthcare delivery (Ensor & Cooper 2004:4). On the demand side, the findings mentioned:

- lack of basic information on the scheme's design and operation
- limited understanding of the principles underlying CHI
- limited community involvement
- lack of trust in the management of the scheme
- problems in ability to pay the premium

On the supply-side they identified:

- limited interest and knowledge of healthcare providers and managers of CHI
- the absence of a coherent policy framework for the development of CHI

A qualitative study conducted by Duc, Raven, Mai, Thi and Tolhurst (2009:106) mention the following barriers to enrolment:

- low perceptions of ability to control health risk
- lack of understanding of health insurance in general and CHI specifically
- perceived problems with scheme administration, benefits and quality of health services

In a quantitative study conducted in Ghana by Sarpong et al (2010:195), barriers to enrolment to the NHIS included low SES, long distances to the health facility, and lack

of consistent information on the NHIS. The degree of literacy is also considered as an influencing factor.

A pre-and post-intervention household survey confirmed that among other factors, lack of information can be a barrier to enrolment. A multifaceted intervention included information, education and communication activities and efforts to improve the administration of a voluntary health insurance scheme. Following the intervention, enrolment in health insurance increased by 6.9% and 7.4% in the two intervention districts (Khan, Tolhurst, Duc, Thi, Pham, Liu & Raven 2009:106).

The data collection in this research included potential barriers to enrolment, such as lack of information on the scheme; limited understanding of CHI; lack of trust in the management; affordability; distance to health facility; perception of the quality of care; and healthcare seeking behaviour.

2.4.4 Preferences of consumers

Understanding consumers' preferences, monitoring them over time and meeting them to the extent which is possible, can determine the success of any health intervention as it enables policy-making to be aligned more closely with public expectations (De Allegri et al 2006b:59). A qualitative research study done in Burkina Faso identified the preferences of consumers in their decision over whether or not to enrol in a CHI. Preferences of consumers are categorised around five themes:

- unit of enrolment
- premium level and payment modalities
- benefit package
- health service provider network
- CHI managerial structures (De Allegri et al 2006b:63-65)

Understanding consumer preferences and incorporating them into the design of CHI may result in increased participation rates (De Allegri et al 2006b:69; Jehu-Appiah et al 2012:223). A qualitative study conducted in Vietnam by Duc et al (2009:106) advocate adjusting the benefit package to the preferences of the consumer. As recommendations to increase enrolment, Duc et al (2009:106) suggest:

- improving communication with the rural population on CHI
- reducing the premium level
- reducing administrative challenges
- addressing provider payment issues

Preferences of potential consumers were also explored in Nigeria. The data of 3070 households was examined for links between preferences for benefit packages offered by different SESes, and the geographic residence of the respondents. The conclusion was that respondents in rural areas and in the lower SES preferred a comprehensive package, while those in urban areas as well as those in the higher SES showed a preference for benefit packages which cover only basic disease control interventions (Onwujekwe, Onoka, Uguru, Nnenna, Uzochukwu, Eze, Kirigia & Petu 2010b:162). In Ghana, determinants of demand were assessed. A quantitative study assessed perceptions on the NHIS in relation to enrolment. It was concluded that benefits and convenience had a stronger predictor effect on enrolment than on price (Jehu-Appiah, Aryeetey, Spaan, De Hoop, Agyepong & Baltussen 2011:162-164).

In summary, the better the consumers' preferences that are met, the higher the probability of enrolment.

2.4.5 Dropout analysis

High dropout rates endanger the sustainability of CHI, not only because they reduce the size of the insurance pool, but also because they have a negative impact on further enrolment and on dropout (Dong, De Allegri, Gnawali, Souares & Sauerborn 2009:178).

In a household survey among 1309 households in Burkina Faso, Dong et al (2009:176-178) analysed the reasons leading to non-renewal to a CHI. Households identified affordability, health needs and demand, quality of care, household head and household characteristics as reasons for not renewing enrolment. A quantitative research study conducted in India by Devadasan, Criel, Van Damme, Lefevre, Manoharan and Van der Stuyft (2011:46-47) linked CHI dropout to patient satisfaction, which is an outcome of good quality care. They conclude that if CHI schemes want clients to adhere to the schemes, they have to improve the quality of care for their clients. Jehu-Appiah et al

(2011:164) identified negative provider attitudes, community health 'beliefs and attitudes', ill health, and technical quality of care as reasons for not renewing enrolment.

2.5 HEALTH INSURANCE IN AFRICA

Even though Africa has the highest disease burden when compared with other regions, it has the lowest per capita spending on health, partly due to its low gross domestic product and partly due to the absence of national healthcare financing strategies (Sambo, Kirigia & Ki-Zerbo 2011:2). In 2009 an estimated US$82 per person was spent on health in the African Region. About half (51%) of the health expenditure was from private sources. From this private expenditure, 62% was out-of-pocket and 29% was spent on prepaid plans (WHO 2012:142, 143). In 2010 the African Union Commission held an official session on Health Financing in Africa. One of its conclusions was that there is a need to develop prepaid health financing systems, such as social health insurance, community health insurance and tax-funded systems to raise more funds for health and cushion households against catastrophic out-of-pocket expenditure on health services (Sambo et al 2011:3-4). Governments should thus provide the necessary, legislative, technical and regulative support and control (Basaza, Criel & Van der Stuyft 2007:11). The TCHP is a CHI that was co-funded by the Health Insurance Fund (HIF), an international not-for-profit organisation. In 2007, the first HIF programmes started in Nigeria (Hendriks, Brewster, Wit, Bolarinwa, Odusola, Redekop, Bindraban, Lange & Schultsz 2011:1; Schellekens et al 2008:10, 11). As of 2012, six insurance programmes are operational in Nigeria, Tanzania and Kenya, with more than 75,000 people insured (UNAIDS 2012:14).

2.5.1 Health insurance in Kenya

Kenya’s vision 2030 for health is to provide equitable and affordable healthcare at the highest affordable standard to her citizens (Government of Kenya 2007:104). This section describes the state-of-the-art data on health demographics, healthcare finance, health insurance and National Hospital Insurance Fund in Kenya.

2.5.1.1 Health demographics

Kenya's population has been growing rapidly and reached 38.6 million in 2009 (Population Reference Bureau 2011:1). Owing to its high fertility rate (Total Fertility Rate (TFR) of 4.6) and declining mortality rate (with a life expectancy at birth of 58.9), Kenya is characterised by a youthful population. About 43% of the population is younger than 15 years of age (Kenya National Bureau of Statistics 2010b:3; United Nations 2006:53). Data from the Kenya Demographic and Health Survey 2008-09 showed a remarkable decline in child mortality levels when compared with the 2003 survey. The mortality rate of under-five year olds has declined from 115 to 74 deaths per 1,000 births, while infant mortality has dropped from 77 to 52 deaths per 1,000 live births (Kenya National Bureau of Statistics 2010b:104). Human immunodeficiency virus prevalence among adults aged 15-49 years was 7.4% in 2007 (National AIDS and STIs Control Programme 2009:9). Full immunisation coverage for children improved from 57% in 2003 to 71% in 2008 (Kenya National Bureau of Statistics 2010b:130). The burden of communicable diseases is still high, with malaria as the leading cause of morbidity (33%), followed by respiratory diseases (29%) (Division of Health Management Information Systems 2009:26).

2.5.1.2 Healthcare finance

Since independence in 1963, Kenya had a predominantly tax-funded healthcare system, but began to gradually introduce a series of health financing policy changes (WHO 2006b). In 1989, the Kenyan government introduced cost sharing in an effort to bridge the growing gap between health sector expenses and available resources. Since then, the government has strived to achieve a mix of healthcare financing strategies and systems that will enable the country to provide its citizens with universal access to adequate basic health services (Kenya National Bureau of Statistics 2010b:5). The health sector in Kenya is financed from three primary sources, which are public, private and donors (Luoma et al 2010:17). Out-of-pocket payment constitutes private sources and comprised 36% of the total expenditure on health in 2006 (Luoma et al 2010:18). This means that the Kenyan health sector relies heavily on out-of-pocket payments. Chuma and Okungu (2010:1) state that the sector is largely underfunded and healthcare contributions are regressive. In other words, the poor contribute a larger proportion of their income to healthcare than the rich.

They further concluded that health financing in Kenya is fragmented, and that universal coverage will not be achieved unless the country adopts a systemic approach to health financing reforms (Chuma & Okungu 2010:1). In the process of health financing reforms, the Kenyan Health Sector Costing Model has been designed. This model is developed to base healthcare reform decisions on evidence, by giving calculations of the total costs of essential healthcare services. The Government of Kenya and key stakeholders have started working with this tool (Flessa, Moeller, Ensor & Hornetz 2011:1, 14). To make healthcare accessible to all, the government uses the following strategies:

- emphasising preventative health financing
- creating fiscal space through the efficient use of resources
- expansion of health insurance schemes (Government of Kenya 2007:110)

In summary, extending access to healthcare to all segments of the population is an important objective of the Kenyan Government and the implementation of CHIs forms part of this objective (Kimani et al 2012:3).

2.5.1.3 Health insurance

Health insurance coverage in Kenya is very low, and comprises both mandatory and voluntary insurance schemes. Only about 10% of the Kenyans have health insurance. The most critical barriers to insurance enrolment in Kenya are a lack of knowledge and an inability to pay (Mathauer, Schmidt & Wenyaa 2008:57). Health insurance coverage is higher among the urban population (19.7%) than it is among the rural population (7.4%); and is higher among the rich (26.4%) than it is among the poor (1.9%) (Chuma & Okung 2011:5). The majority of Kenyans do not have access to affordable healthcare due to poverty, which was estimated at 48% in 2009 by the Multidimensional Poverty Index (Oxford Poverty & Human Development Initiative 2011:1). It is estimated that 44% of Kenyans who fall sick do not seek healthcare services due to a lack of finances (Ministry of Medical Services 2008:50). Around 38% of Kenyans must dispose of their assets or borrow to pay for medical bills. Forty one percent of households face catastrophic expenditures because of the need to pay directly for health services at the point of consumption (Luoma et al 2010:18).

Another way of addressing excessive medical costs in Kenya is by the principle of “harambee”. “Harambee” is a Swahili word meaning “let us pull together”, and extols the virtue of people sharing and supporting each other within their community. A “harambee” is based on voluntary reciprocity, and might assist people who are in financial need, as in the case of a high medical bill (Mathauer et al 2008:57), in which instance it comes to replace the need for health insurance. It is not strange that CHIs appeared amidst this spirit of solidarity within the communities in Kenya. The Kenya Community Based Health Financing Association (KCBHFA) is an association set up to facilitate members and other key stakeholders in the promotion of CHIs, and thereby access to quality and equitable healthcare. KCBHFA was initiated in the year 2002. In 2010, 9 member organisations and 33 CHI schemes were subscribed, covering a total individual membership of 258,000 people with beneficiaries in excess of one million people (Health Non-governmental Organisations’ (NGO) Network 2010:9).

2.5.1.4 National Hospital Insurance Fund

Out of the 10% of Kenyans that are insured, 7% are members of the National Hospital Insurance Fund (NHIF) (Luoma et al 2010:22). The NHIF, established in 1966, is the only government run health insurance scheme in Kenya, and was among the earliest attempts to use risk pooling to finance healthcare. The scheme was initially designed for formal sector workers, mandatory by law, and was restricted to financing in-patient care through a fixed bed rebate. It has undergone several changes over the years to include more benefits, target informal sector households, and recently, to introduce out-patient care (Ministry of Medical Services 2011:16). According to Mathauer et al (2008:57), CHIs are in competition with the NHIF in Kenya, where CHIs might be more aligned to people's needs than are state or private insurance mechanisms.

2.6 THEORETICAL FRAMEWORK

The concepts of Bennett’s model (2004) and the HIP framework formed the theoretical base for the study.

2.6.1 CHI basic model

Bennett (2004:150-152) developed a basic model to illustrate how a CHI scheme works. Applying this model to the TCHP gave the results shown in figure 2.1.

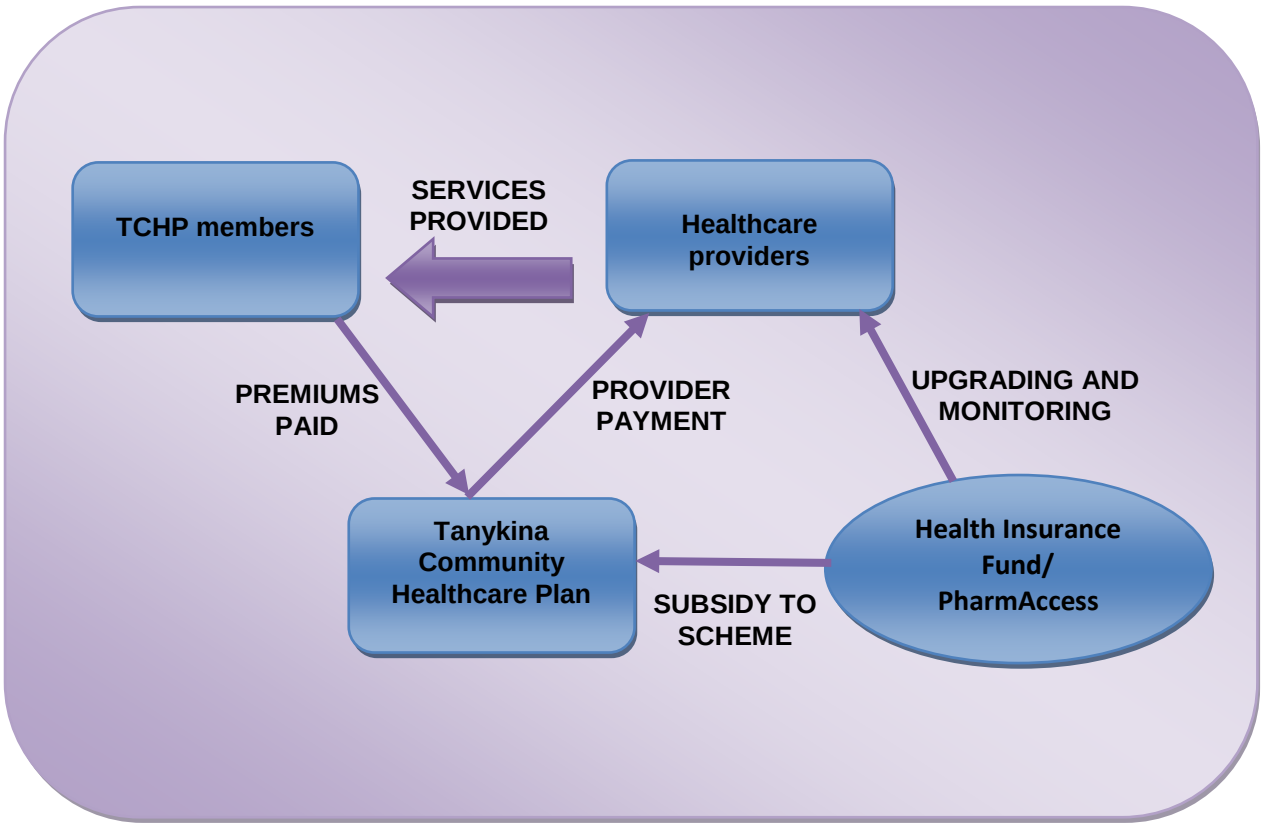

Figure 2.1 Model of Community Health Insurance Scheme applied to the TCHP
(Bennett 2004:152)

It shows that households enrolled in the scheme pay premiums into the TCHP fund. In turn, the TCHP pays healthcare providers for services, and in return, these providers offer healthcare services to the TCHP members. Then, there is an extension to the basic model by an external subsidiser. This scenario is very widely prevalent in Sub-Saharan Africa. This external subsidiser can be the government. In the TCHP scheme, the external subsidiser is HIF, via PharmAccess. One part of the subsidy goes directly into the TCHP fund, another part is used for upgrading and monitoring the healthcare providers. Under the TCHP, five selected health facilities are designated as healthcare providers.

2.6.2 HIP framework

The Platform for HIP has developed a framework to assist Health Insurance Schemes (HIS) in their monitoring, which serves also as a theoretical framework for this study. (Van den Broek, Martens, Ten Have, Matthijssen & Spaan 2011:3). Initially, the HIP framework was developed to be used for various health insurance schemes, such as social health insurance, private health insurance and community-based insurance. Thus far, only CHI was tested. Thus originally, the HIP framework referred to HIS, but in the context of this study, it is applied to CHI. The framework is based on the objectives of a health insurance scheme, the stakeholders of the health insurance scheme and the four phases of a health insurance action cycle. The framework itself is described and applied to the description of the TCHP.

2.6.2.1 The objectives

Figure 2.2 gives an overview, illustrating the relationship between the objectives of CHI and its stakeholders.

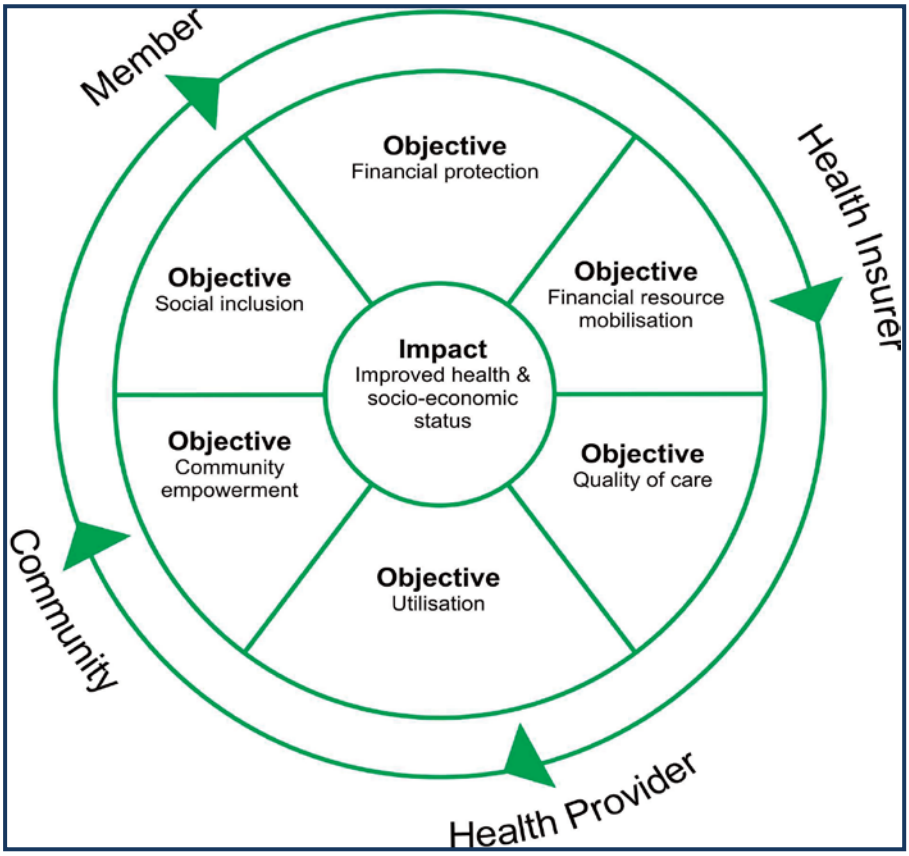

Figure 2.2 The relationship between stakeholders and objectives

(Van den Broek et al 2011:5)

The objectives of CHI can be categorised under three basic categories as evidenced by figure 2.2.

The financial objectives of CHI are to:

- protect insured clients or patients against high out-of-pocket and catastrophic health expenditures (*financial protection*)
- mobilise more sustainable funds to cover healthcare costs (*financial resource mobilisation*)

The operational objectives of CHI are to:

- improve performance of health services in terms of quality of patient care, productivity, and health services covered (*quality of care*)
- increase utilisation of contracted healthcare services by the insured clients of the health insurance scheme (*utilisation*)

The social objectives of CHI are to:

- empower community members and individuals by gaining control over the factors and decisions that affect their health. In relation to health insurance, this can be practiced by enabling the community to become a respected stakeholder in the local healthcare system for *community empowerment*
- stimulate enrolment of various groups of the population in the health insurance scheme, specifically the poor and vulnerable, taking into account their financial situation, gender, or other factors that can hinder participation in the CHI (*social inclusion*) (Van den Broek et al 2011:3)

2.6.2.2 TCHP objectives

The overall TCHP objective was formulated by its stakeholders as follows: “TCHP is a member-driven healthcare plan which provides accessible, affordable and quality healthcare that supports the realisation of economic prosperity for farmers and their

families" (PharmAccess 2010c:12). This objective has financial, operational and social elements, but is not further elaborated in specific objectives by the TCHP stakeholders. Nevertheless, the TCHP implicitly targets the financial, operational and social objectives as already described.

2.6.2.3 The stakeholders

Figure 2.2 gave an overview, illustrating the relationship between the stakeholders and the objectives. A HIS is generally discussed as an interaction between three stakeholders:

- the members or clients of the health insurer and consumer of healthcare services
- the healthcare provider
- the institution or health insurer

In the HIP framework, a fourth stakeholder is added, which is the community. The community is considered to be that group of persons residing in the catchment area of the CHI. The importance of the involvement of the entire community for the viability of the scheme is high. The communities' willingness to pay for the CHI, their financial capability and the appropriateness of the scheme for their health needs, defines whether individual persons or families actually become members, might be potential members, or will never become members of the scheme.

In low-income countries, indirect stakeholders can also be national and international institutions that set policies and regulations, and provide financial and/or technical support.

As illustrated in figure 2.2, stakeholders have a range of objectives prompting their participation. The figure demonstrates which objectives are nearer to the four stakeholders. For example the objective of quality of care is in the figure linked to the health provider as stakeholder. The arrows indicate that this is not pre-defined. A health insurer can also be interested in social inclusion, and a health provider can also aim to empower the community (Van den Broek et al 2011:4). In the context of this research, it is interesting to note the prominent place of the community within this framework.

2.6.2.4 The TCHP stakeholders

The stakeholders of the TCHP are HIF, PharmAccess, TDPL, AAR Health Services Ltd and the local community.

2.6.2.4.1 The Health Insurance Fund

Health Insurance Fund was established in 2005 as an initiative of Dutch insurance companies, Dutch multinationals and PharmAccess (PharmAccess 2010d:1). It is a foundation that develops private health insurance schemes for uninsured, lower income groups that are willing and able to pay part of an insurance premium. Its vision is to build a health insurance financing and delivery system that functions effectively and efficiently over a long-term period (PharmAccess 2010a:7). The HIF receives grants from different donors, among others the Dutch Ministry of Foreign Affairs, the World Bank, and USAID (PharmAccess 2010d:1). The fund uses donor money on the demand side to subsidise insurance premiums for the previously uninsured poor. At the supply side the fund subsidises upgrading plans for contracted healthcare providers. This is expected to increase the accessibility of good quality healthcare (Papkalla & Kupfer 2009:26; Preker, Zweifel & Schellekens 2010:13-14).

2.6.2.4.2 PharmAccess Foundation

PharmAccess began in 2001 as a Dutch not-for-profit organisation dedicated to the strengthening of health systems in Sub-Saharan Africa.

PharmAccess is the contracting partner of HIF, and has developed the TCHP, an HIF programme in Kenya (PharmAccess 2010e:4). PharmAccess wishes to offer a health insurance product tailored to the needs of the selected target groups. This product covers basic healthcare services provided by selected private, public and mission healthcare facilities. The quality of the services of these selected healthcare facilities are upgraded and monitored on a regular basis (PharmAccess 2010d:1).

2.6.2.4.3 Tanykina Dairy Plant Ltd

Tanykina Dairy Plant Ltd is a farmer-owned dairy cooperation operating in Nandi North District, which registered as a company in 2003. In 2012, the TDPL had seven milk collection centres, and processed about 30,000 litres of milk each day, with a peak supply of 36,000 litres during the rainy season. Their membership file consisted of 11,970 members. These members are farmers who have experience of supplying milk to one of the milk collection centres. Not all farmers are able to supply milk every month. From September 2011 to August 2012, the TDPL had a monthly average of 3366 milk suppliers that they consider to be active members. In addition to milk bulking, cooling and marketing for their small holder dairy farmers, the TDPL offers other services. These include: agro-vet services, veterinary and artificial insemination services and animal feeds processing (PharmAccess 2010b:17). The TCHP is also considered as an extra service, owned by TDPL (TCHP 2011c:1).

2.6.2.4.4 AAR Health Services Ltd

PharmAccess investigated the local market of private insurance companies, and selected AAR as the local implementing partner for the CHI. AAR started its operations in 1984 and is Eastern Africa's largest private health insurance company operating in Kenya, Uganda and Tanzania. It differs from other providers because of a comprehensive benefit package and due to its focus on clinical risk management and provision of preventative care (AAR [Sa]:2). The TCHP is the first CHI programme in which AAR has partnered. Short term objectives of the partnership include building local financial, administrative and medical capacity in the public and private healthcare sector. The main long-term objective of the partnership is to develop a sustainable model fostering increased access to basic healthcare services, and treatment for currently uninsured people within the low and middle income range (AAR 2011:7).

2.6.2.4.5 Community

The location where the TCHP was implemented is Nandi North District. The highlands provide adequate rainfall for farming and agriculture and form the economic base of the residents of this district (PharmAccess 2010e:6). In order to develop an understanding of the community, a quantitative research study was conducted among a random

sample of 400 respondents of the target group by Taylor Nelson Sofres Research International (TNS, a global market research company). This research gave insight into the demographics, socio-economic characteristics and health status of TDPL members and involved their needs, behaviour and attitude regarding healthcare in general and CHI in particular (TNS Research International 2010:4).

2.6.2.5 The health insurance action cycle

According to the HIP framework the health insurance action cycle has four phases: context analysis, planning, implementation and reflection, as shown in figure 2.3.

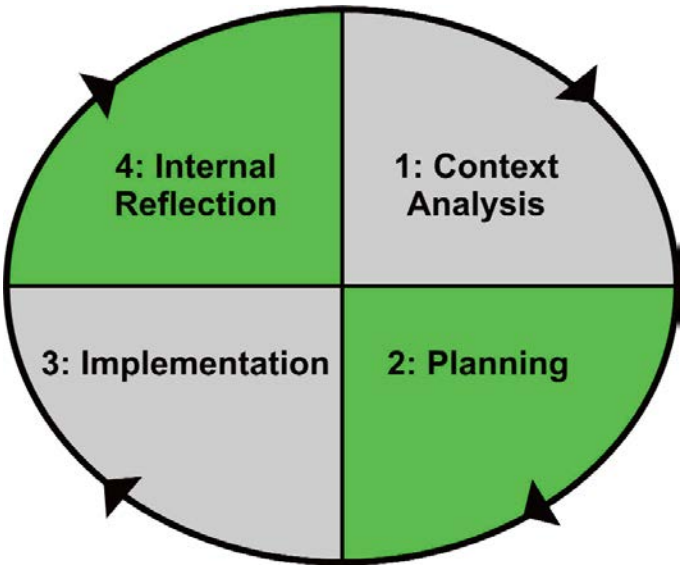

Figure 2.3 The phases of the health insurance action cycle
(Van den Broek et al 2011:7)

During each phase, two main components can be identified:

- Context analysis: During this phase, a context analysis is done to portray the scheme's environmental profile and preparedness for health insurance.
- Planning: In this phase, attention is given to the formulation of objectives and development of the design.
- Implementation: The third phase encompasses the implementation of strategies and activities, data collection and process in the registers.

- Internal reflection in relation to key objectives: In the fourth and final phase, the key indicators are used to perform an analysis of strengths, weaknesses, opportunities and threats (SWOT) (Van den Broek et al 2011:7).

The four phases of the health insurance action cycle gave a clear overview of the processes of CHI implementation and was therefore very useful in systematically reviewing the TCHP.

2.6.2.6 The TCHP action cycle

In this section, the TCHP and its implementation process was described according to the four phases of the health insurance action cycle as exhibited in figure 2.3. Each phase consisted of two components.

2.6.2.6.1 Phase 1: The TCHP context analysis

According to the HIP framework, the phase of context analysis assists in deciding whether a CHI fits into the context or not. This phase is split into two parts: scheme environmental profile and preparedness for health insurance.

The TCHP environmental profile

In 2008, a scoping study was performed by PharmAccess to analyse the local context and assess the feasibility of a CHI in Kenya. A scoping study aims to rapidly map the key concepts underpinning a research area and the main sources and types of evidence available (Arksey & O'Malley 2005:23). Based on the results, HIF gave approval to develop a CHI programme in Kenya (PharmAccess 2010b:3). In January 2010 PharmAccess performed a target group study and selection. After a screening and selection process that involved site visits, discussion and a workshop with farmer group representatives, TDPL was selected. The following final selection criteria were decisive: cohesion, structure, capacity and motivation of the cooperation (PharmAccess 2010b:13, 14). The target group members of the TCHP are typically married couples between the ages of 25 and 54 years old, making up households of five to six people, meaning that they had an average of three to four children. The majority of male members of the household were slightly better educated by having completed

secondary school, whereas their female counterparts had only completed primary school.

The main source of income is generated through agricultural products, both live stock, consisting mainly of cows, and crops that consists mainly of maize. The average income is around Ksh 10,000 per household per month. They fall within the lower SES groups of Kenya's population (TNS Research International 2010:6-9). Common diseases amongst the target group include: malaria, diarrhoea, pneumonia, flu, cough, diabetes and typhoid fever (TNS Research International 2010:28). In terms of the target group, living environment, infrastructure is a real challenge as distances are long between households and health facilities. Moreover, the roads are of bad quality, especially during the rainy season, and modes of transport are unreliable in Nandi North District. This has a significant impact on locals' ability to obtain timely, affordable and quality healthcare (PharmAccess 2010e:7).

Preparedness for the TCHP

The target group's perception towards insurance and insurance companies was encouraging. They perceived insurance to be a good thing for both family and business purposes. The fact that insurance can prevent financial disaster and even mitigate risks, was well understood. This positive perception of insurance can contribute to the relatively high prevalence of the intention amongst members of the target group to take up health insurance. However, a significant number of members found the available healthcare unaffordable and unreliable (PharmAccess 2010e:7; TNS Research International 2010:71, 74, 84). Healthcare facilities in the target area were detected and assessed by PharmAccess's multidisciplinary Medical Due Diligence (MDD) team. The MDD concluded that in general, the quality of healthcare in the target area was very low and that households in the target group urgently needed the upgrading of necessary primary care. Most of the available healthcare facilities were in need of equipment and some of them were seriously understaffed (PharmAccess 2010c:5).

2.6.2.6.2 Phase 2: The TCHP planning

This phase consisted of formulations of objectives and developing the design.

Formulation of the TCHP objectives

During the TCHP partner meeting held in September 2010, the overall objective as mentioned in 2.6.2.2 was formulated by the TCHP stakeholders.

Developing the TCHP design

Based on experience in Nigeria and Tanzania, it was recognised that the involvement of the target groups in the design and operation of the programme is the key to its success (PharmAccess 2010b:3). To ensure target group participation and engagement in the process of package development, CHAT sessions took place in June 2010. CHAT stands for Choosing Health Plans All Together. A CHAT session is a simulation exercise for groups with iterative rounds of play that facilitate group decision making. It is a participatory and deliberative technique designed to allow for a discussion of prioritisation and the trade-offs of health insurance coverage. CHAT was developed in the USA to assist in health insurance development for lower-income groups and applied in India to the design of CHI schemes (Goold, Biddle, Klipp Hall & Danis 2005:563-565). PharmAccess conducted twelve CHAT sessions, six among male and six among female groups (PharmAccess 2010d:2-3). Through these sessions, a section of the community was involved by designing the benefit package.

Based on the MDD report, it was decided to upgrade five healthcare facilities in the catchment area of the target group; namely Kaiboi Health Centre, Kaigat Health Centre, Chepkemel Health Centre, Kabiemit Health Centre and Chepterwai Sub-District Hospital (PharmAccess 2010c:6). The health centres are medium-sized basic health centres that are minimally staffed by a clinical officer offering preventative and curative services, mostly adapted to local needs. Chepterwai Sub-District Hospital offers referral and guidance to the health centres in the surrounding area. Besides curative services, it also offers rehabilitative services (Ministry of Medical Services & Ministry of Public Health and Sanitation 2011:25). After activation into the scheme, a member receives a personalised membership card with a pass photo and registered fingerprint. Services at the contracted providers are only provided with a valid membership card and on fingerprint verification. Table 2.1 gives an overview of the benefit package for the members of the TCHP.

Table 2.1 The TCHP benefit package overview

OUTPATIENT
Consultation at selected health centres in TDPL catchment area
Medication covered for diseases
Basic laboratory diagnostic tests at health facilities
Maternity (ante- and postnatal and delivery) and child healthcare
INPATIENT
Admission upon referral to Moi Teaching and Referral Hospital in Eldoret, in case of emergencies and those that cannot be handled by health centres
Additional diagnostic services such as X-rays and ultra sound
Surgery for life threatening conditions, including caesarean-section
Transport in case of emergency

(TCHP 2011c:3-4)

There is no limit on outpatient consultations, but there is a limit to inpatient cover up, to that of three admissions per year, with a maximum of ten days per admission (TCHP 2011c:3-4).

Table 2.2 provides an overview of the monthly premiums payable by members of the TCHP, according to family size.

Table 2.2 The TCHP premium overview

FAMILY SIZE	**AMOUNT**
1 person	Ksh 375
2-3 persons	Ksh 750
4-6 persons	Ksh 998
7 or more persons	Ksh 1499

(TCHP 2011b)

The premiums as listed in table 2.2 are deducted at the end of each month from each TCHP member's milk account, in order to pay for coverage in the following month. When a TCHP member does not pay via his milk account, the premium can be paid in

cash at one of the milk collection centres. To promote the TCHP, a discount of 25% was given on the premium for year 1 by enrolment in the year 2011.

2.6.2.6.3 Phase 3: The TCHP implementation

The HIP framework divides the phase of implementation into implementation of strategies and activities; as well as data collection and processing of all data in the registers.

Implementation of the TCHP strategies and activities

A profound marketing strategy was used to introduce the TCHP to the community. In order to inform, educate and excite TDPL members about the TCHP, a thorough communication plan was implemented including radio, road shows, mobile, promotional materials, community outreach activities, meetings and one-to-one contacts. The key marketing strategies were described in this section (PharmAccess 2010d:21).

- *Radio*

The radio is a dominant medium in Kenya with an average of 99% of all households owning a radio set. Within the Central Rift Province, Kass FM has the highest listenership (PharmAccess 2010d:8). Commercials and interviews on the TCHP are regularly broadcasted on Kass FM.

- *Promotional material*

As promotional material, three brochures are available for distribution:

- a general information brochure with full explanation of the TCHP and contact information (TCHP 2011b)
- a brochure with Frequently Asked Questions, based on market research (TCHP 2011a)
- a brochure with Terms and Conditions stating in detail the TCHP regulations (TCHP 2011c)

- *Community outreach*

Local market days were used to inform the community as a whole about the TCHP, using a portable booth. So called “field days” were held at the upgraded five health centres to demonstrate their improvements and give some general information to the community on key healthcare issues. Those with influence in the community were debriefed on the TCHP during special meetings (PharmAccess 2010d:22-23).

- *TDPL member outreaches*

Regular membership meetings at four milk collection centres were used to give information on the TCHP, to active TDPL members. Moreover, forums were held at the same four collection centres to create space for discussion. During these forums besides discussion, additional information was given and a Treasure Pot Game was played (PharmAccess 2010c:2). The Treasure Pot Game is aimed at providing people with a basic understanding of risk pooling and insurance for healthcare. Before the official launch of the TCHP, employed sales executives started to visit each TDPL member household to educate them on the TCHP and to pre-sign-up members. An additional advantage was to gather feedback from TDPL members on the TCHP (PharmAccess 2010d:21-23). In September 2012, there were still 14 sales executives actively visiting TDPL households to inform them on the TCHP.

2.6.2.6.4 Phase 4: TCHP data recording

When sales executives visited the TDPL households to educate them on the TCHP, information was gathered to populate a database. For this reason, these visits were called Member Information Gatherings (MIG) (PharmAccess 2010d:21). A Data Collection Form was filled out to facilitate possible enrolment in future. Official enrolment is done by completing the Activation Form, activation by AAR and payment of the premium. AAR is in charge of data recording, while TDPL is responsible for premium collections by monthly deduction of the milk account or cash payment (TCHP 2011c:2).

2.6.2.6.5 Internal reflection of the TCHP

The HIP framework suggests internal reflection, by measuring the progress towards the objectives and by making a SWOT analysis, which is discussed below.

2.6.2.6.6 Measuring the TCHP key objective

To measure the TCHP key objective, questions on accessibility, affordability and quality of healthcare were posed in the interview schedule.

2.6.2.6.7 SWOT analysis of the TCHP

The description of factors that influence enrolment in the TCHP helped to assess the strengths, weaknesses, opportunities of and threats to the scheme. The SWOT analysis assisted in giving a formal report to the TCHP management on the identified issues to be addressed and considered when planning strategies.

2.6.2.6.8 Concluding remarks on the TCHP action cycle

During implementation, the TCHP had already successfully undergone the first three phases of the health insurance action cycle. The formulation of objectives was limited, resulting in only one overall objective that was formulated. A thorough analysis of the context was undertaken. With regard to preparedness for health insurance, the target group's perception of insurance and insurance companies was encouraging. However, it was questionable as to whether TDPL members could afford a premium of Ksh 998 for an average family size of 4 to 6 persons, which amounts to 10% of the average monthly income of Ksh 10,000. On implementation of the TCHP, a profound marketing strategy was undertaken. The responsibilities regarding data collection and processing were determined. This study constituted phase 4, which is an internal reflection that includes the performance of a SWOT analysis.

2.8 CONCLUSION

This chapter described the relevant aspects of health economics that pertain to CHI. It explained what CHI is, and expounded evidenced-based factors that influence

enrolment in CHI in less developed countries. An overview of the health insurance situation in Kenya was given. Bennett's model and the HIP theoretical framework were elaborated upon. The TCHP was discussed according to objectives, stakeholders and the health insurance action cycle.

Chapter 3 describes the research methodology.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter gives a comprehensive description of the research design and the method of this study. A research design is referred to as the "architecture" of a study, because the choice of a study design determines how to sample the population and to collect data. The choice of the study design for this study was determined by the research problem and research objectives posed (Joubert & Ehrleich 2007:77). To describe factors that influence the enrolment in a CHI, a quantitative, descriptive, contextual, cross-sectional research design was used. Research methods are the techniques and procedures researchers use to structure a study and to gather and analyse information relevant to the research question (Polit & Beck 2012:12). The research method followed included: determining the population; sampling and sampling technique; data collection and data analysis methods; aspects of validity and reliability. Ethical considerations influence and are influenced by the choice of a study design and research methodology (Joubert & Ehrleich 2007:77). The ethical considerations taken into account have been substantiated.

3.2 RESEARCH DESIGN

According to Burns and Grove (2009:696), a study design is the blueprint for conducting a study that maximises the control possible over factors that could interfere with the validity and reliability of the findings. This study followed a quantitative, descriptive, contextual and cross-sectional design. The context took a significant position in this study and was further elaborated in the ensuing discussions. Brink et al (2006:10) divide descriptive studies according to the time sequence during which the data are collected. When referring to the time sequence, this study is cross-sectional in its design, due to the fact that it was conducted ‘in the present’ to examine that which was extant (Brink et al 2006:10). The discussion that follows focuses on the introduction of the research context, research paradigm; descriptive, contextual and cross-sectional design.

3.2.1 Research context

The research context or research setting refers to the physical location and conditions under which data collection takes place in a study (Polit & Beck 2012:743). Ekman (2004:256) mentions that CHI can be a feasible option in certain contexts, and that features of CHI contexts should be systematically analysed. The TCHP was implemented in Nandi North District, which falls under Nandi County in the North Rift Valley Province in Western Kenya. Figure 3.1 is a map of Kenya, with Nandi County located in Western Kenya as indicated by the white circle on this map.

Figure 3.1 Map of Kenya

(Kenya Primary School Atlas 2005:8)

Nandi County consists of five districts, namely Nandi North, Nandi Central, Nandi South, Nandi East and Tinderet. The Kenyan Population Census of 2009 estimated the population of Nandi County to be 750,000. Nandi County demarcates an area of 2,884 km², with a population density of 261 people per km². Eighty four percent of the people live mostly in rural areas (Kenya National Bureau of Statistics 2010a:32). Figure 3.2 is a

map of the TDPL catchment area. This map shows the location of the four TDPL milk collection centres and the five health centres under the TCHP.

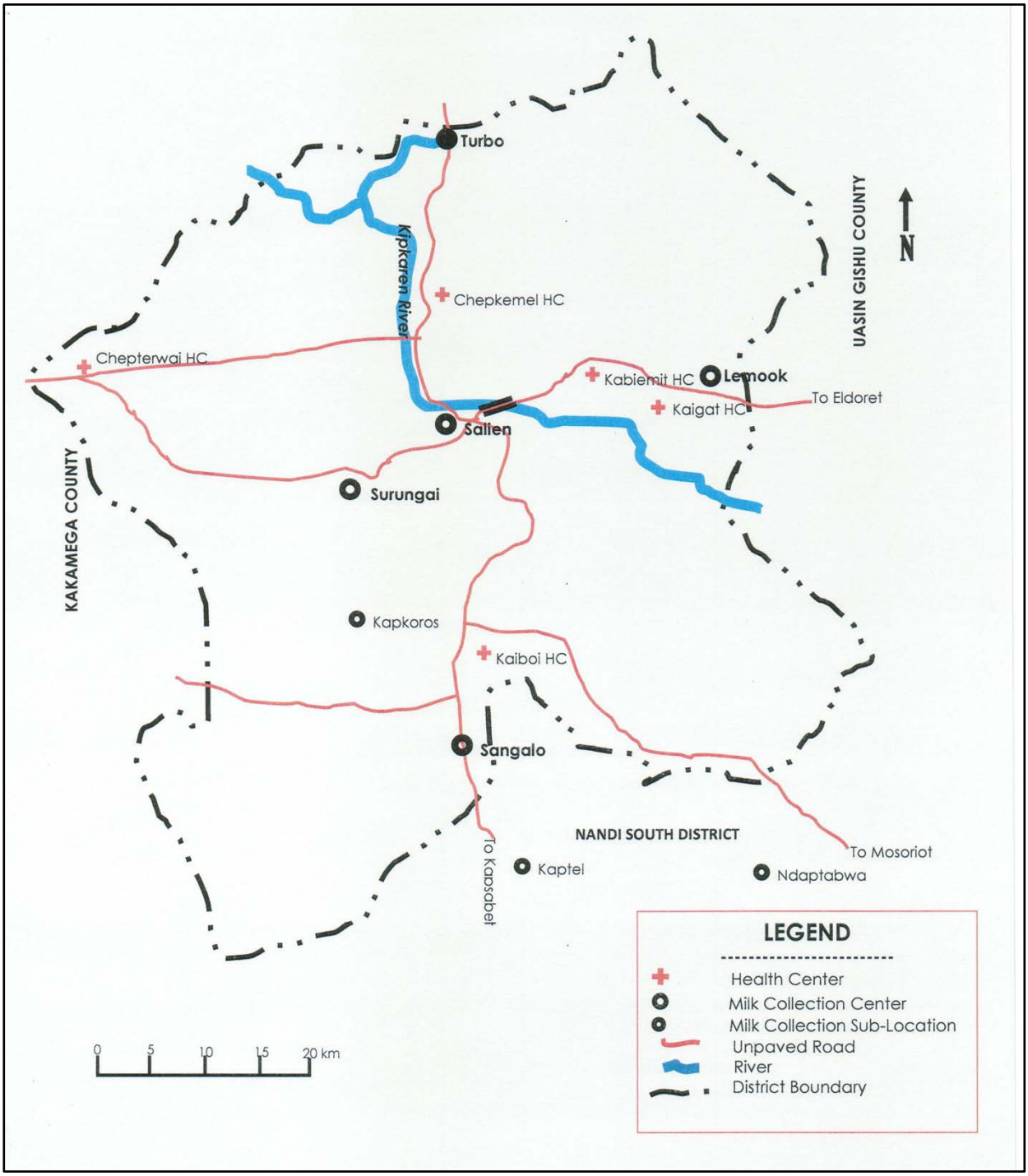

Figure 3.2 Nandi North District Tanykina Dairy Plant Ltd catchment area designed by Were Consultancy 2012

The main language spoken at home in Nandi County is Kalenjin. However, the national languages of Kenya are Kiswahili and English, which the majority of the people in the county can speak.

As the principal members of the TDPL, the dairy farmers usually do not bring their milk to the milk collection centres themselves. It is brought to the various collection centres by their transporters or employees.

The Kenya National Bureau of Statistics indicated the following health and education coverage figures for Nandi County, information which is crucial in the implementation of a CHI.

Table 3.1 Health and education coverage in Nandi County

SERVICE COVERAGE INDICATOR	NANDI COUNTY in %	KENYA in %
Birth delivery in a health centre	27.4	37.5
Qualified medical assistant during birth	48.6	37.6
Had all vaccinations	80.9	75.0
Adequate height for age	68.3	59.8
Can read and write	74.5	66.4
Attending school, 15-18 years	88.3	70.9

(Kenya National Bureau of Statistics 2010a:32)

Five out of the six indicators were higher than the national average, meaning that Nandi County has better-than-average access to the indicated services. The adequate height for age, which is a possible indicator of poverty, was also higher than the national average (The World Bank 2012:63). The only indicator that was lower than the national average was the indicator on birth delivery in a health centre. This could be linked to the table that follows, which indicates the population per health worker.

Table 3.2 Population per health worker in Nandi County

POPULATION PER HEALTH WORKER	NANDI COUNTY in 000s	KENYA in 000s
Population per nurse	3137	2054
Population per doctor	94	25

(Kenya National Bureau of Statistics 2010a:32)

Table 3.2 indicates the availability of doctors and nurses in Nandi County, as compared to the national average. For Nandi County, it was estimated that 3137 nurses and 94 doctors cater for 100,000 people in Nandi County. This means that there were more health workers available in the area than the national average. This is in line when taking into consideration the fact that medical assistance during birth was higher than the national average.

3.2.2 Quantitative paradigm

This research followed a quantitative paradigm, because it provided a numeric description of trends, attitudes and opinions of the study population, by studying a sample of that population. From the sample results, quantitative research enabled the researcher to generalise results and make claims about the population only at the context where the study was done because of the sample size (Creswell 2009:145).

Advantages of quantitative research in this study were that it:

- Incorporated logistic, deductive reasoning to generate predictions that were tested in the real world of farmers (Brink et al 2006:11; Polit & Beck 2012:13)
- emphasised objectivity in the collection and analysis of data through empirical observations and measures (Brink et al 2006:11; Creswell 2009:145)
- used a validated interview schedule to ensure objective data collection (Creswell 2009:145)
- used structured procedures and formal instruments to collect and analyse data in order to achieve credible research results (Brink et al 2006:11)
- used numeric data analysis through statistical procedures to enhance objectivity (Brink et al 2006:11)

Disadvantages of quantitative research were that:

- the focus could have been concise and reductionistic, by breaking the whole into parts, so that the parts can be examined (Burns & Grove 2009:23)
- structured procedures and formal data collection instruments hampered measurement of the understanding of the unique, dynamic, holistic nature of human beings (Burns & Grove 2009:23)
- data were limited, as they provided numerical description rather than detailed narrative description and thereby left out human perceptions on dimensions, meanings, and importance of phenomena (Polit & Beck 2012:18)

A quantitative approach was appropriate for this study, because much was known about the phenomena under research and because the population lent itself to drawing upon a representative numeric sample.

3.2.2.1 Descriptive

The descriptive study design was crafted to gain more information about characteristics within this field of study. The purpose was to provide a picture of situations, circumstances and conditions as they naturally happened to the respondents. A descriptive design was used to identify challenges with current practice of CHI (Burns & Grove 2009:237). In this descriptive study, the researcher did not manipulate any variables. The researcher merely searched for accurate information about the characteristics of dairy farmers and their enrolment to a CHI. The variables of interest, such as factors, influence, enrolment in a CHI, access to quality healthcare and dairy farmers themselves, were identified and conceptually and operationally defined. Opinions, attitudes, needs or facts related to the study phenomena were described to provide a complete picture of the phenomenon as it exists in reality (Brink et al 2006:104). Therefore, in this study, factors influencing enrolment in a CHI were investigated, described and documented.

3.2.2.2 Contextual

The design was contextual, because this study sought to understand the interaction between the intervention of a CHI and the perceptions amongst the population of how it impacts healthcare in the local context. There is still a lack of insight into the optimal links between context, the scheme's design and the eventual outputs and outcomes of the scheme. With regard to a CHI Criel et al (2004:1041) state that "the key question is not *what* works, but rather *why, for whom* and *in what circumstances* mechanisms or interventions that do work succeed. This study sought to describe contextual factors that influence enrolment in the TCHP, to obtain better access to healthcare for the people of Nandi County. By using an inductive approach, it attempted to make use of specific time- and locality-bound data to arrive at general patterns (Stommel & Wills 2004:439).

3.2.2.3 Cross-sectional

In relation to the time sequence, this study was cross-sectional in design. Polit and Beck (2012:725) define a cross-sectional design as a study design in which data is collected at one point in time. A cross-sectional design involves the collection of data once the phenomena under study have been captured during a single period of data collection. The cross-sectional design was appropriate in this study for describing the enrolment status of respondents o the CHI and for describing relationships among such a status and access to quality healthcare at a fixed point in time (Polit & Beck 2012:184; Burns & Grove 2009:241).

3.3 RESEARCH METHOD

This section serves to describe how the research problem and objectives were addressed, in other words, how the investigation was carried out and which techniques and procedures were followed in conducting the study (Brink et al 2006:191). Thus the following are discussed: the population; sampling and sampling technique; sample criteria and sample size; data collection method; data processing and analysis; measures to ensure validity and reliability; as well as ethical considerations.

3.3.1 Population

A population is defined as the entire group of people or objects that is of interest to the researcher, in other words, that meets the criteria for inclusion of sample to a study (Brink et al 2006:123; Burns & Grove 2009:42). Universal population refers to all the dairy farmers in Kenya.

According to Polit and Beck (2012:274), the target population is the aggregate of cases about which the researcher would like to generalise findings. The target population were the dairy farmers that were members of the TDPL. Polit and Beck (2012:274) state that the accessible population is the aggregate of cases that both conform to designated criteria, and that are accessible as subjects for the study. For the purpose of this study the accessible population were the active members of TDPL who supplied milk and were available at the time of data collection. Table 3.3 gives an overview of the monthly milk suppliers starting from September 2011 up to August 2012.

Table 3.3 Monthly number of milk suppliers

MONTH	PAID SUPPLIERS in 000s
September 2011	4166
October	4647
November	4724
December	4642
January 2012	4406
February	3308
March	2474
April	1948
May	2161
June	2577
July	2902
August	2434
Monthly average	**3366**

The number of suppliers has been fluctuating, mainly because of seasonal changes in weather. The month of April 2012 was the worst for these farmers in terms of their milk production, since there had hardly been any rainfall for three months since January 2012. The accessible population for this study was milk suppliers who came to TDPL at

Lemook collection centre and those followed up in their homesteads. Figure 3.3 gives an overview of the accessible population according to enrolment status.

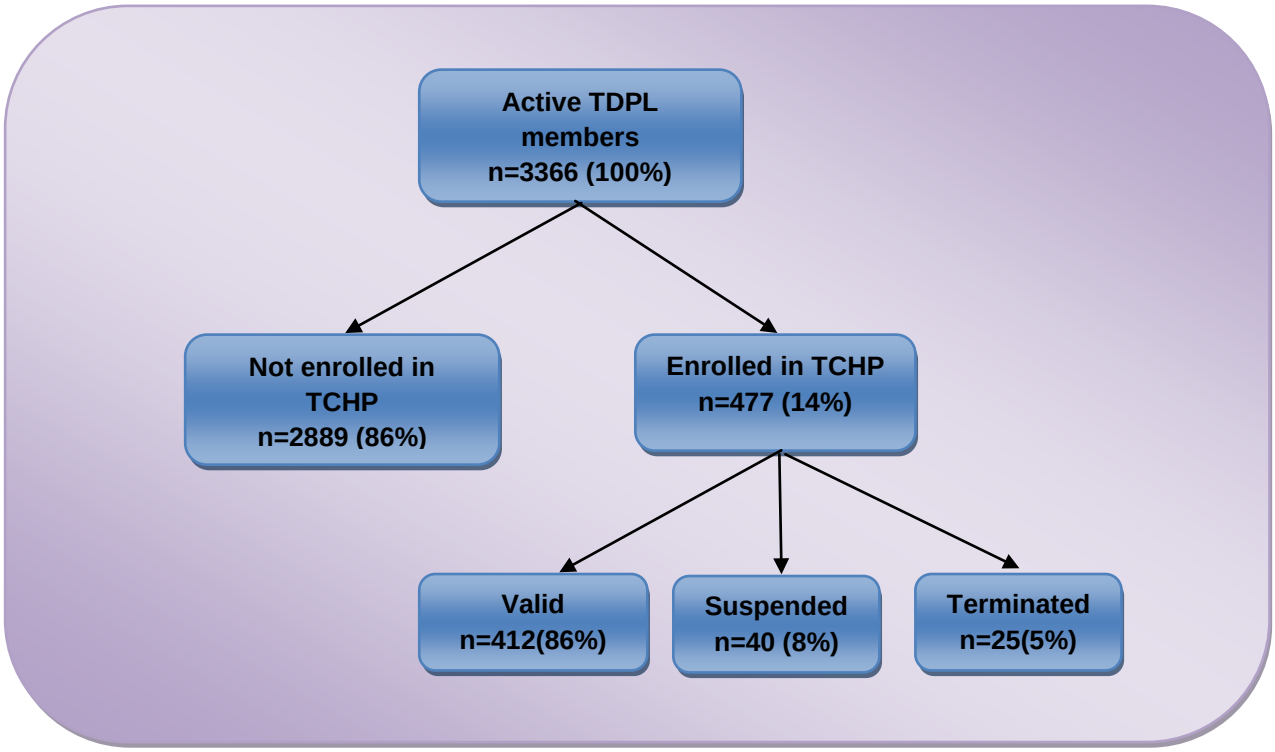

Figure 3.3 Overview of accessible population

The accessible population comprised of active members of TDPL who were described as either enrolled to the TCHP, not enrolled, suspended or terminated. TCHP members pay their premiums with the milk supply at each milk collection centre.

Table 3.4 Milk suppliers per location

	Enrolment status					
Location	**Not enrolled**	**Enrolled**	**Active**	**Suspended**	**Terminated**	**Total**
Salien	846	156	137	12	7	1002
Lemook	215	66	47	11	8	281
Sangalo	430	166	19	12	7	596
Surungai	466	89	35	5	3	555
Total	**1957**	**477**	**238**	**40**	**21**	**2434**

Table 3.4 gives an overview picture of members of TDPL of the four milk collection centres. Although there are four locations of milk collection, for convenience purpose the sample was drawn from the milk suppliers of the Lemook collection centre.

Sampling

Sampling means taking any portion of a population or universe as representative of that population or universe (Burns & Grove 2009:35; Polit & Beck 2008:339). It defines the process for selecting a group of people, events, behaviours or other elements with which to conduct a study where the research population cannot be managed because of its size.

3.3.1.1 Sampling criteria

Sampling criteria, also referred to as eligibility criteria, include a list of characteristics essential for eligibility in the target population (Polit & Beck 2012:274).

Included in this research were:

- Active TDPL members who supplied milk in August 2012 to the Lemook milk collection centre
- TDPL members who are 18 years and older
- Both males and females

Excluded from this research were:

- Non-members or not active members of TDPL
- Dependants of the principal members; children, relatives or workers
- Members not able to speak sufficient Kiswahili or English to respond to the interview

3.3.1.2 Sampling technique

The researcher intended to conduct random sampling by making use of a list of active TDPL members. However, the starting day set for data collection happened to be a

market day in Lemook, which includes a cattle sale. On this day, many of the TDPL farmers were at market and were not to be found at their homesteads. Out of the random sample list, there were only a few telephone numbers of TDPL members available. Due to the rural setting, the mobile telephone network was poor, making it difficult to contact the farmers via phone. This resulted in conducting a convenience sample. Convenience sampling is a non-probability sampling technique in which not all members of the population have an opportunity to be included in the sample (Burns & Grove 2009:353). Convenience sampling, also called accidental sampling is defined as respondents who are included in a study because they happen to be in the right place, at the right time and they are entered into the study until the desired sample size is obtained (Polit & Beck 2012:274). It was used as there was no structured way of contacting people for a given study and available time for data collection (Bruce, Pope & Stanistreet 2008:139; Polit & Beck 2012:742)**.**

Quota sampling was used as a method in which "quotas" for certain sample characteristics are established in order to increase the representativeness of the sample. It was a convenience sample technique with an added strategy to ensure inclusion of all the respondents as evidenced in figure 3.3 and that none of them is underrepresented. Variables used for stratification in this case were the enrolment status of the members. To determine a total population, the monthly average of 3366 farmers was considered. Out of this population, 477 members were enrolled in the TCHP. It was thus ensured that 14% of the sample was TCHP-enrolled. The sample consisted of 135 respondents, where 61 respondents were interviewed at the market and the other 74 interviews took place at the homesteads of the interviewers.

3.3.1.3 Sample size

As total population, the monthly average of 3366 farmers was considered. Out of this population, 477 members were enrolled in the TCHP. This meant that 14% of active TDPL members fell under the category "enrolled". The sample size formula used to estimate the sample size for this study (Sullivan 2008:157) is given below:

$$n_0 = p(1-p)\left(\frac{Z}{E}\right)^2$$

Where z is the value from the standard normal distribution reflecting the confidence level that will be used (z = 1.96 for 95%), E is the desired margin of error, which for purposes of this study was assumed to be 5%, and P is the proportion of members enrolled; which was 14% in this study.

Therefore: $n_0 = 0.14(1 - 0.14)(\frac{1.96}{0.05})^2$

n_0 = 185

This formula gave an estimated sample size of 185 members.

Since the population was finite, correction was done with the following formula:

$\left(\frac{n_0}{1+\frac{n}{N}}\right) = \left(\frac{185}{1+\frac{185}{3366}}\right)$ = 163

where N is the target population size and where the estimated sample size gave a number of 163.

However, calculations based on a former enrolment rate of 11% gave an estimated sample size of 135. The researcher therefore targeted a sample size of 135. Due to increased enrolment rates, the calculated sample size at the time of data collection had also increased. Sampling error was thereby decreased, power increased and bias was minimised (Burns & Grove 2009:351).

3.3.1.4 Sampling plan

Given the principal estimated sample size of 135 and according to the proportions of enrolment status in the accessible population (see figure 3.3), the following sampling plan was developed and achieved:

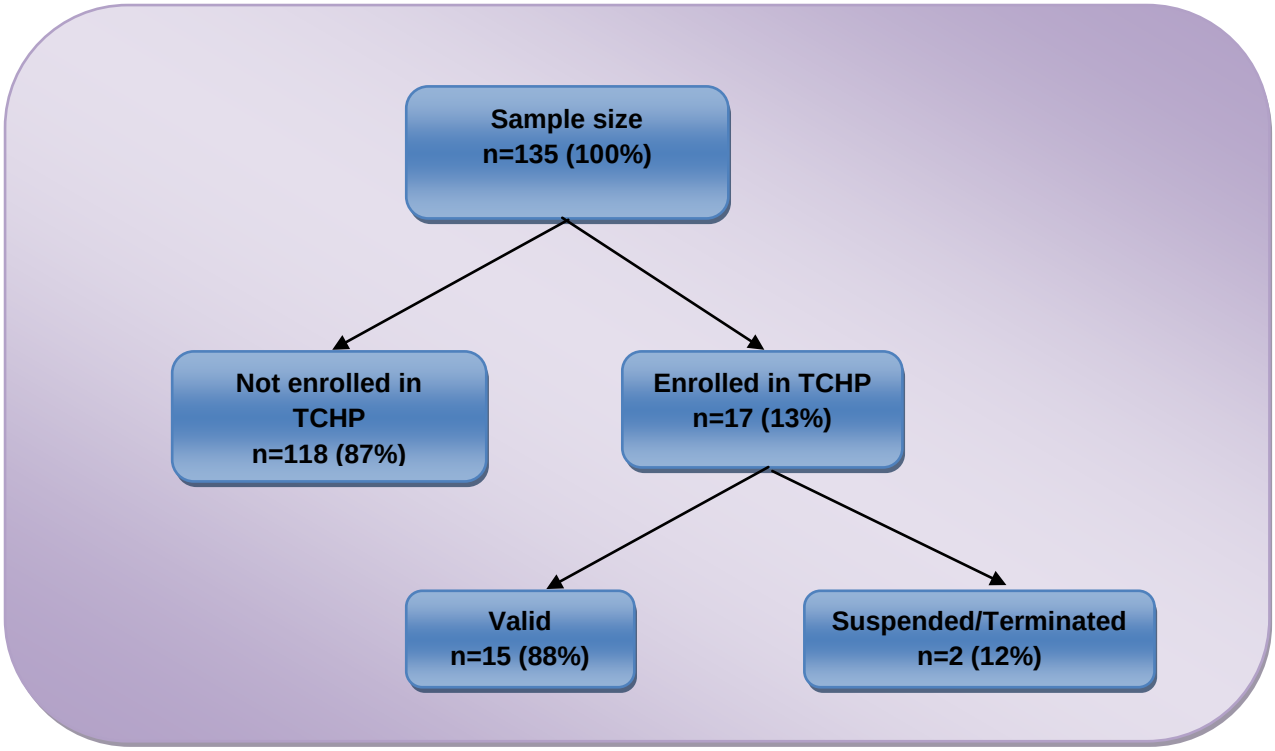

Figure 3.4 Sample overview

The sample plan was followed based on the stratified variables of respondents in figure 3.3 and the outcome of the sample size attained and depicted in figure 3.4.

The membership file of TDPL consists of 11,970 members who brought milk to one of the milk collection centres, ever since the cooperation started in 2003. The list has not been regularly updated, meaning that it contains members that do not regularly bring milk. It neither recorded death or migration updates. Next to the names the list stated the milk supply number, the registration date, national identification number, gender, location, telephone number and enrolment status. For the purpose of this research, the list was used as a sample plan to identify and locate eligible persons to be included in the sample.

3.3.2 Data collection

Data collection is the process of identifying respondents and the precise, systematic gathering of data relevant to the research purpose, question and the specific objectives

of a study (Burns & Grove 2009:44, 695). Data was collected by conducting structured interviews and using an interview schedule after permission was obtained from the management of the TCHP and informed written consent (Annexure D) from the respondents to interview both the respondents and the relevant documents for information to contact the eligible respondents.

3.3.2.1 Data collection approach and method

A structured or standardised interview is an interview in which the researcher exercises maximum control by predetermining a fixed wording and sequence for all questions. The interviews were presented in the same form to all respondents, and the interviewers asked the questions exactly as stated in the interview schedule (Waltz, Strickland & Lenz 2010:288).

The researcher chose to conduct structured interviews in accordance with the following reasoning:

- The response rate to interviews is higher than to self-administered questionnaires, especially in a rural area like Nandi County, where people are not likely to fill out a questionnaire.
- Interviews allow researchers to collect data from respondents who are unable or unlikely to complete questionnaires, such as the very ill or those whose reading, writing, and ability to express themselves are marginal. Thus, interviews can offer a more representative sample (Burns & Grove 2009:405).
- Structured interviews yield the same answer categories across cases, facilitating a comparison of responses.
- Summary and analysis of findings is easier when dealing with limited and standardised response categories (Stommel & Wills 2004:246).

3.3.2.2 Characteristics of the data collection instrument

The data collection instrument was an interview schedule (Annexure F). An interview schedule is a questionnaire with close-ended questions, accompanied by indications of how to answer each question (Brink et al 2006:151). The questions were based on the literature review, Bennett's model and the HIP framework. The literature review was

used to explore words, concepts, categories and dimensions to include in the interview schedule (Johnson & Christensen 2012:51). From the literature review, the researcher identified variables that may influence enrolment in a CHI. Variables are characteristics or conditions that change or have different values for different individuals (Gravetter & Forzano 2012:18). The following variables were identified: socio-demographic characteristics; promotion and community entry; knowledge and understanding of the TCHP; benefit package; affordability and payment modalities, management of the TCHP; accessibility of health services; attitude towards CHI, understanding of risk pooling, socio-cultural practices and quality of health services. By developing the interview schedule, the researcher endeavoured to capture these variables as follows:

Table 3.5 Overview of the interview schedule

SECTION	CONTENT	QUESTION
A Socio-demographic characteristics	Socio-demographic characteristics and enrolment status	1-12
B Factors related to (non)enrolment	Promotion and community entry	13,14.7, 14.8
	Knowledge and understanding of the TCHP	14.1, 14.2
	Benefit package	14.3, 14.4
	Affordability and payment modalities	14.5, 14.6
	Management of the TCHP	14.9, 14.10
	Accessibility of health services	15
	Attitude towards CHI	16.1, 16.2
	Understanding of risk pooling	16.3, 16.4
	Socio-cultural practices	16.5, 16.6
C Enrolment satisfaction	Quality of health services	17-19

The interview schedule (Annexure F) was structured into three sections that covered aspects on 47 variables using a Likert scale. Each item in the interview schedule had a response set that provided the parameters within which the respondent could answer. Three qualitative questions were included at the end of the interview, asking if the respondent had any additional comment to make about the TCHP. This gave valuable narrative information and confirmed the numeric description. The interview schedule was in English and translated into Kiswahili with the help of a local linguist, expert in both languages, to avoid any misinterpretation of the questions (Annexure F).

The majority of the interviews were conducted in Kiswahili, since that was the language both interviewers and respondents were comfortable with.

3.3.2.3 Testing of the data collection instrument

A pre-test is a smaller version of a proposed study conducted to refine the methodology, such as the instrument or data collection process (Burns & Grove 2009:713). Purposes of pre-testing include the following:

- Recording how much time it takes to administer the entire instrument.
- Identifying parts of the instrument that are difficult for respondents to understand or that may have been misinterpreted.
- Assessing whether the sequencing of questions is sensible (Polit & Beck 2012:296).

The research instrument was pre-tested on a small number of respondents who were comparable to the sample, but who were not part of the main study. A pre-test of the interview schedule was conducted with six respondents with regards to the central milk collection Salient. Out of these, four were not enrolled in the TCHP, one enrolled and one terminated, due to an inability to pay the premium. The pre-test resulted in amendments to the interview schedule, such as reformulation of questions, changes in sequence of questions for improved flow, and the omission of some questions. After modifying the interview schedule, the instrument was administered to the full sample.

3.3.2.4 Data collection process

The researcher trained three interviewers to assist with data collection. The interviewers received a clear explanation about the study and its purpose. Ethical issues such as informed consent, confidentiality, anonymity and respect were addressed. They were trained on adherence to the interview schedule and its translated copy in Kiswahili where needed, in order to avoid misunderstanding in English. The researcher worked together with the interviewers on the days of the interviews to correct errors and increase the return rate. The researcher checked the completed instruments at the end of each day for omissions. The researcher was responsible for the selection of the sample to ensure that eligible respondents were included. The interviews were done over three days where 61 respondents were interviewed at the market in a quiet place designated for the purpose as it was very noisy at the market itself. The other 74

interviews took place at the homesteads of the respondents. These households were traced by making use of personal information from records kept at the milk centre such as milk supply number, the registration date, national identification number, gender, location, address, telephone number and enrolment status. Permission was obtained to access the records. In some other instances Lemook village elders and TDPL milk transporters were consulted for assistance to locate the respondents. Gender balance of the sample regulated itself, since the interviews at the cattle market were mostly conducted with male respondents, while the interviews at the homesteads were mostly conducted with female respondents. The study had a 100% return rate (n=135).

3.3.3 Data analysis

Data analysis refers to techniques used to reduce, organise and give meaning to data (Burns & Grove 2009:44). In quantitative studies, data analysis relies heavily on the tools of statistical analysis. Data analysis involves two steps: a summary of the results and an interpretation thereof (Stommel & Wills 2004:27). Data was analysed using descriptive and inferential statistics with the help of a statistician. All variables were categorical. Descriptive statistics were used to describe and summarise data and the results were presented in the form of percentages, frequencies, tables, bar graphs and pie charts. Inferential statistics were used to identify relationships between and among variables. Exploratory factor analysis was used to reduce the multidimensionality of the data. Logistic regression was conducted to predict the chance of enrolment in the TCHP. Analysis was undertaken at a significance level of 5% and a p-value of 0.05. For analysis, the software package Stata SE Version 12 was used. The three qualitative questions were analysed by means of content analysis.

3.4 VALIDITY AND RELIABILITY OF THE STUDY

The quality of research and research instruments is determined by their validity and reliability. In this study, the researcher adhered to the principles of reliability and validity.

3.4.1 Validity

The validity of a data collection instrument determines the extent to which it actually reflects the abstract construct being examined. As the roots of the word imply, validity has to do with truth, strength, and value (Burns & Grove 2009:381). In other words, validity is the degree to which an instrument measures what it is supposed to measure (Polit & Beck 2012:336). The service of a statistician was used to check if the structure of the instrument and the formulated items were in line with the research question and research objectives of the study. For the purpose of this study, the researcher distinguished validity between face, content, construct, internal, and external validity.

3.4.1.1 Face validity

Face validity refers to whether the instrument looks like it is measuring the target construct (Polit & Beck 2012:336). It is essentially based on an intuitive judgement made by experts in the field (Brink et al 2006:160). However, Burns and Grove (2009:381) mention that face validity is no longer considered acceptable evidence for validity. Nevertheless, it is still an important aspect of the usefulness of an instrument. Brink et al (2006:160) rightly state that it should not be considered a satisfactory alternative to other types of validity. In this study, face validity was ensured by enlisting the help of TCHP and theory experts, who read the interview schedule and shared their input.

3.4.1.2 Content validity

Content validity refers to an assessment of how well the instrument represents all the components of the variable to be measured (Brink et al 2006:160). In other words, content validity examines the extent to which the method of measurement includes all the major elements relevant to the construct undergoing measurement. The evidence therefore was obtained from the literature review, theoretical framework and by presenting the interview schedule to a statistician along with the supervisors of this study (Burns & Grove 2009:381). Among the dimensions of evaluation were clarity of wording, relevance of the items to the construct and the appropriateness for the target population (Polit & Beck 2012:358-359).

3.4.1.3 Construct validity

Construct validity examines the fit between conceptual and operational definitions of variables and determines whether the instrument actually measures the theoretical construct that it purports to measure (Burns & Grove 2009:693). Construct validity is a key criterion for assessing the quality of a study (Polit & Beck 2012:339). In this study, the construct under investigation was “factors influencing enrolment of dairy farmers in a community health insurance scheme”. Construct validity was ensured by conducting an extensive literature review and conceptually and operationally defining all the key concepts of the construct. A statistician was consulted in order to examine the construct validity of the questions in the interview schedule.

3.4.1.4 Internal validity

Internal validity is the extent to which the effects detected in the study are a true reflection of reality, rather than being the result of the effects of extraneous variables (Burns & Grove 2009:704). Internal validity was evidenced by exploratory factor analysis. The analysis revealed the presence of two underlying factors that explained the study construct. Due to circumstances, the researcher had to conduct quota convenience sampling. Although random sampling gives a stronger base for internal validity than convenience sampling does, the researcher endeavoured to retrieve a variables representative sample through use particularly of quota sampling, evidence of which is reflected in the heterogeneity of the variables of the sample. The carefully designed interview schedule was validated with reference to the literature, as well as by experts in the field, which included the study supervisors (Polit & Beck 2012:246).

3.4.1.5 External validity

External validity refers to the extent to which study findings can be generalised beyond the sample used in the study (Burns & Grove 2009:700). One aspect of external validity concerns the representativeness of the sample. Although convenience sampling was used, the use of quota sampling strengthened the issue of variable representativeness to increase validity. The sample size was reasonably broad in context in order to

produce more accurate population value estimates, reduce sampling error and generalise the findings in the context (Polit & Beck 2012:404).

3.4.2 Reliability

Reliability refers to the consistency of measures obtained in the use of a particular instrument, and indicates the extent of random error in the measurement method (Burns & Grove 2009:377). The reliability of a quantitative instrument is a major criterion for assessing its quality. The less variation an instrument produces in repeated measurements, the higher its reliability. Thus, reliability can be equated with a measure's stability, consistency, or dependability. Reliability also concerns accuracy. An instrument is reliable to the extent that its measures reflect true scores, that is to the extent that measurement errors are absent from obtained scores (Polit & Beck 2012:331). Cronbach's alpha is a coefficient of reliability, and is commonly used as a measure of the internal consistency or reliability. In this study Cronbach's alpha was found to be 0.85, which is considered very good (Field 2009:677).

3.5 ETHICAL CONSIDERATIONS

Polit and Beck (2012:727) refer to research ethics as a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal, and social obligation that the researcher has in relation to the study respondents. In this study, considerations were taken to ensure protection of the rights of the respondents and the research institution, while ensuring scientific integrity.

3.5.1 Protecting the rights of the respondent

Brink et al (2006:35) outline that there are various procedures and mechanisms that a researcher should apply in order to ensure that the respondents' rights are protected.

The following rights of respondents were considered:

- The right to information, whereby respondents had the right to full information, meaningful disclosure of the specific risks and benefits that could occur as a result of research participation. Disclosure occurred through a formal process of

informed consent (Annexure D). Therefore, an informed consent form was explained to respondents and signed by them (Polit & Beck 2012:154; Stommel & Wills 2004:380).

- The right to self-determination, which is based on the ethical principle of *respect* for persons and their *autonomy*. This means that a respondent was able to decide freely whether to participate in the study or to discontinue participation at any stage of the study without risk of coercion or victimisation (Burns & Grove 2009:189-190; Polit & Beck 2012:154).
- The right to *privacy*, which meant that an individual had the right to determine the time, extent and general circumstances under which personal information would be shared with or without others (Burns & Grove 2009:194-195; Polit & Beck 2012:156). For this reason, the informed consent form stated: "No one else but the interviewer will be present unless you would like someone else to be there for you."
- The right to *confidentiality* and *anonymity*, which is the researcher's management of private information that must not be shared with others without the authorisation of the respondent (Burns & Grove 2009:196, 197; Polit & Beck 2012:162, 163). Regarding confidentiality, the consent form stated: **"**You are assured that any information you share will remain strictly confidential and will be used solely for the purpose of this study. Though the information will be published, it won't be shared with anybody on personal basis. All information collected from you will be kept in a secure place by the researcher. The data will be accessible only to the researcher and the supervisors." No personal information was to be included on the interview schedules. Codes were used to identify the respondents.
- The right to *fair treatment*, which is based on the ethical principle of justice, where each person ought to be treated fairly. In research, the selection of subjects and their treatment during the study should be fair (Burns & Grove 2009:198; Polit & Beck 2012:155). Although convenience sampling was conducted, the sample was representative of the study population and included respondents of various enrolment status to a CHI.
- The right to *protection from discomfort and harm* is based on the ethical principle of *beneficence.* The researcher endeavoured to protect the respondents from discomfort and harm in order to bring about the greatest possible balance of benefits in comparison with harm. This study was considered as a minimal-risk

study (Burns & Grove 2009:198-199; Polit & Beck 2012:152-153). However, there was a counsellor available were there to be any psychological discomfort caused due to participating in the study. There was no direct benefit to the respondents, but participation aided the improvement of the operations of the TCHP.

3.5.2 Protecting the rights of the institution

The research endeavoured to protect the rights of the institution by obtaining official ethical approval from the Higher Degrees Committee of the Department of Health Studies at UNISA. This committee is legally mandated to objectively review research proposals on their merits and risks, and to make recommendations about the ethical conduct of the research (Stommel & Wills 2004:384). An ethical clearance certificate was obtained (Annexure A). A letter requesting permission (Annexure B) to conduct the study was submitted to the management of TDPL. By means of this process, a letter of permission to conduct this research was obtained from the management of TDPL (Annexure C).

3.5.3 Scientific integrity of the research

The researcher adhered to the principles of scientific integrity by:

- endeavouring to be honest in reporting and communicating the research steps taken to conduct the study. This entailed honesty in presenting goals and intentions, in reporting research methods and procedures, and in conveying interpretations of results through use of standardised methods.
- ensuring reliability through the assistance of use of a statistician to confirm that the research was as reliable as possible and its communication fair and complete and accurate.
- obtaining objectivity by presenting facts capable of proof, and transparency in the documentation of the empirical process.
- being compliant with the rule of science and research integrity in all the steps taken to complete the dissertation.
- remaining honest in providing references and giving credit to the work of others both in the text and in the reference list.

- taking responsibility for future generations pursuing science by adhering to dissertation writing standards for dissemination purposes, prescribed scientific writing and examination processes (European Science Foundation 2009:8; 2011:5).

By adhering to the principles of scientific integrity above, the researcher avoided research misconduct, such as plagiarism, fabrication of results or falsification of data.

3.6 CONCLUSION

This chapter described the research design and methods used in conducting this study. A quantitative, descriptive and contextual, cross-sectional study design was utilised. It included discussions on population, sampling, sampling technique, data collection, validity and reliability of the instrument, data analysis and ethical considerations.

Chapter 4 presents an analysis of data and interpretation of the research findings.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

A quantitative, descriptive, contextual, cross-sectional research design was used to conduct this study, the aim of which was to determine factors that influence the enrolment in a CHI among dairy farmers in Kenya. This chapter discussed the data presentation, analysis and interpretation. The analysis was conducted with the help of a statistician (Annexure F). The background of the data analysis can be found in Annexure G.

4.2 PURPOSE OF THE STUDY

The purpose of this study was to investigate factors that influence the enrolment of dairy farmers in the health insurance scheme of the TCHP for better access to healthcare.

The objectives of the study were to:

- explore and describe factors that influence enrolment by dairy farmers in a CHI scheme for better access to healthcare
- generate evidence based information on factors that influence dairy farmers to enrol in an insurance scheme that can be used to make recommendations to the TCHP management on how to improve the CHI

In order to achieve the purpose, the study sought to answer the following research question:

What are the factors that influence the enrolment of dairy farmers in a CHI in order to obtain better access to healthcare?

The data analysis was part of the fourth phase of the health insurance action cycle within the HIP framework. This fourth phase consisted of internal reflection on the CHI scheme. The data analysis provided input for the SWOT analysis.

4.3 DATA ANALYSIS

Data was analysed with the help of a statistician using Stata SE, Data Analysis and Statistical Software, Version 12. Data was collected from 135 respondents. One of the selection criteria for inclusion in the sample was that a farmer had to be an active TDPL member. All the 135 respondents were active members who supplied milk to the plant in the month before the data collection. Out of the 135 respondents 87% (n=118) were not enrolled in the TCHP and only 13% (n=17) were enrolled in the TCHP. Two of the enrolments were terminated because of non-payment of premiums.

Comparisons in the analysis were made on critical aspects between the two groups, but other aspects were general. Figure 4.1 gives an overview of the structure followed for data analysis according to sections A, B and C in the interview schedule.

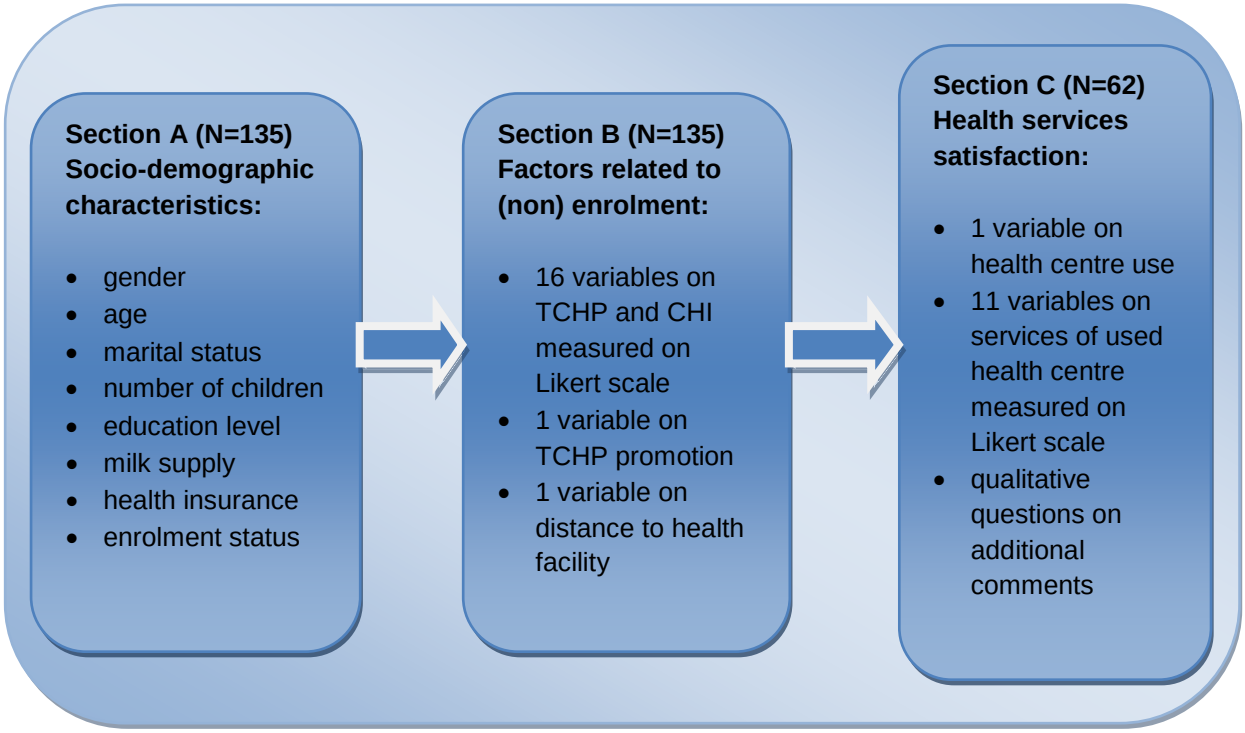

Figure 4.1 Data analysis overview

Data was analysed by using descriptive and inferential statistics. Descriptive statistics were used to describe and summarise data and the results were presented in the form

of percentages, frequencies, tables, bar graphs and pie charts. Inferential statistics were used to identify relationships between and among variables. Exploratory factor analysis was used to reduce the multidimensionality of the data. Logistic regression was conducted to predict the chance of enrolment in the TCHP.

4.3.1 Section A: Socio-demographic characteristics

This section dealt with the respondents' socio-demographic data, which included gender, age, marital status, number of children, education level, milk supply and health insurance enrolment status. For every characteristic, the overview of the whole sample (n=135) was given. It was indicated whenever there was a significant difference between the enrolled (n=17) and the non-enrolled (n=118).

4.3.1.1 Item A1: Respondents' gender (N=135)

Of the respondents, 46% (n=62) were female and 54% (n=73) were male, meaning that there were slightly more male than female. Figure 4.2 depicts the respondents' gender. Of the TCHP enrolled, 29% (n=5) were female and 71% (n=12) male, thus there were significantly more male than female enrolled respondents.

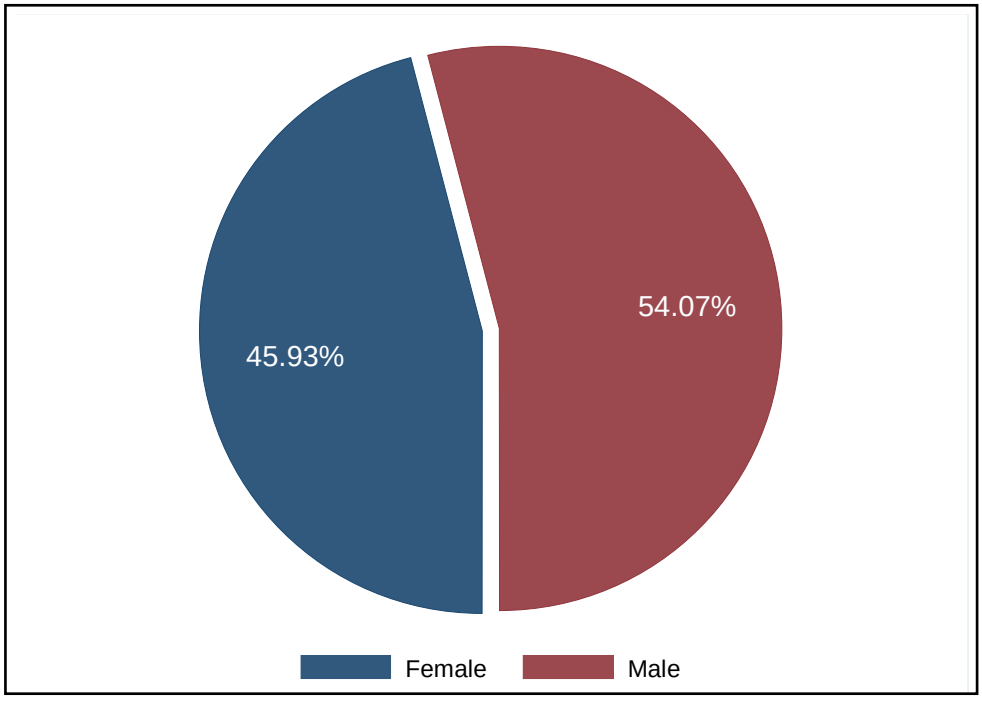

Figure 4.2 Distributions of respondents by gender (N=135)

The dispersal of gender was influenced by the venues where the interviews took place. The first day of data collection was at the cattle market of Lemook, where 61 interviews took place. The majority of these interviews were conducted with male respondents, because it is their role to attend the market selling and buying cattle on that day. The other 74 interviews took place at the homesteads of the respondents, where the majority of respondents were female. On a former qualitative study among TDPL members, it was concluded that both men and women take decisions on healthcare in the target population. “Although the man takes the final decision, the woman of the house has an influential role. She is the one who is aware of the health issues of the entire family and takes care of the children when they are ill. She will come with advice to the husband” (PharmAccess 2010d:7). Therefore, the gender dispersal of the respondents in the study was representative of the target population.

4.3.1.2 Item A2: Respondents' age (N=135)

Figure 4.3 shows the age distribution of the respondents. Most respondents (33%; n=44) were between the ages of 35 and 44 years.

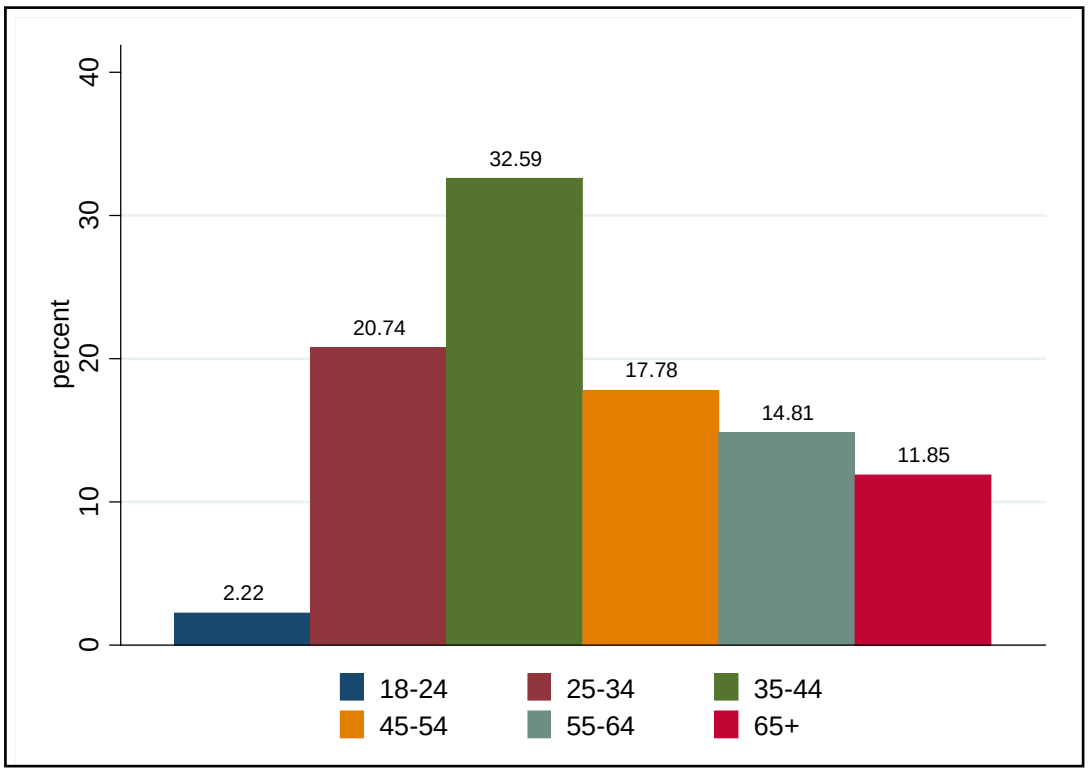

Figure 4.3 Age distribution of respondents in years (N=135)

Of the TCHP enrolled 41% (n=7) were above the age of 55, while of the non-enrolled, 24% (n=29) were above the age of 55, meaning that the average age of those enrolled tended to be higher than that of those who were not enrolled. This is described by Wonderling et al (2005:255) as adverse selection, whereby those older or in a more fragile state of health are more likely to subscribe to health insurance than younger and healthier people. Parmar et al (2012:181) confirm that adverse selection is an important concern, especially for subsidised CHIs. Because of the small sample size, the researcher will not be able to confirm the adverse selection as claimed by literature.

4.3.1.3 Item A3: Marital status of respondents (N=135)

Of the respondents, 87% (n=118) indicated that they were married, 7% (n=9) indicated that they had never been married, and 6% (n=8) indicated that they were divorced, separated or widowed. Of the enrolled respondents 82% (n=14) were married and 18% (n=3) had never been married. Ibiwoye and Adeleke (2008:230) found that married couples had a higher tendency to subscribe to the NHIS in Nigeria than persons that were not married. Kimani et al (2012:5) confirm that formerly married and never married members of the community were seen as less likely to participate in a public health insurance programme. The group in this study was as low as 13% (n=17) of the sample. The percentage of married respondents (87%; n=118) was significantly higher than the national percentage of married couples, which was 55% (Kenya National Bureau of Statistics 2010b:29).

4.3.1.4 Item A4: Respondents' number of children (N=134)

Figure 4.4 shows the number of children of the respondents. One respondent did not complete this question on the interview schedule for an unknown reason, hence this item shows only 134 responses.

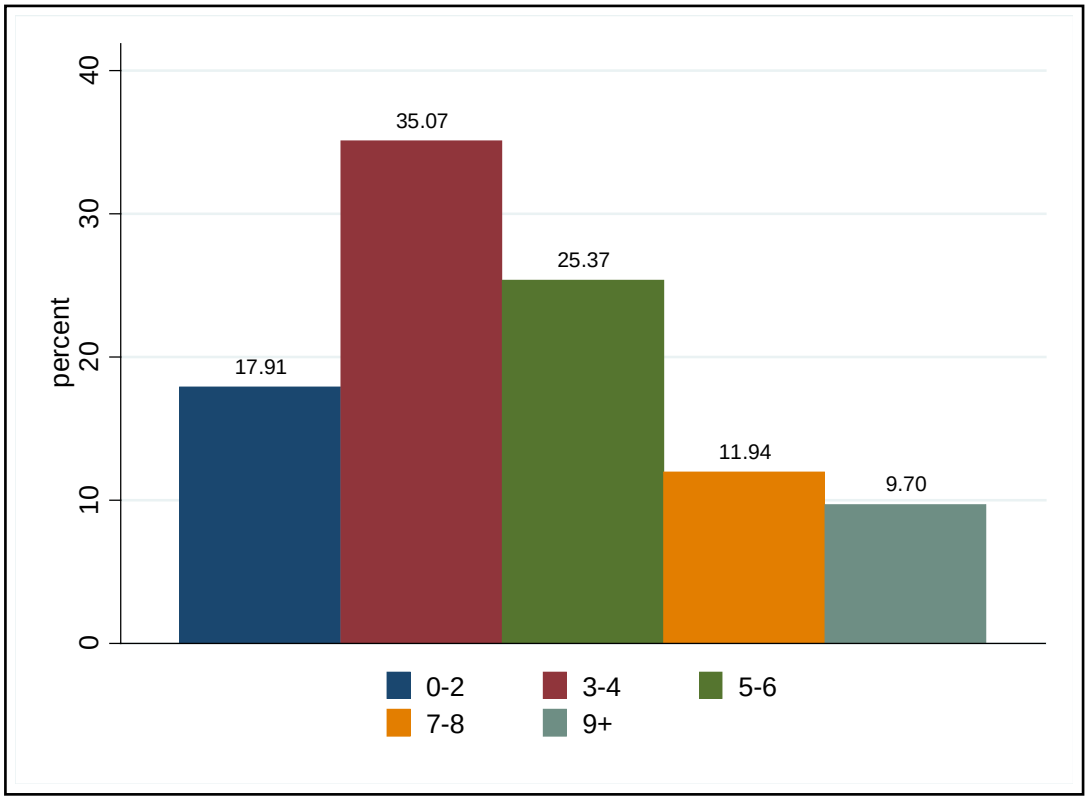

Figure 4.4 Respondents' number of children (N=134)

Most respondents (35%; n=47) had three to four children. This number is close to the national total fertility rate (TFR) of 4.6 children, but lower than the national TFR of 5.2 children for rural areas (Kenya National Bureau of Statistics 2010b:47). Out of the enrolled respondents 38% (n=6) had seven or more children, compared to the non-enrolled 19% (n=33). This confirms the finding of De Allegri et al (2006a:854) that enrolment in a CHI was associated with a higher proportion of children in the household.

4.3.1.5 Item A5: Respondents' education level (N=135)

Figure 4.5 shows the respondents' education level.

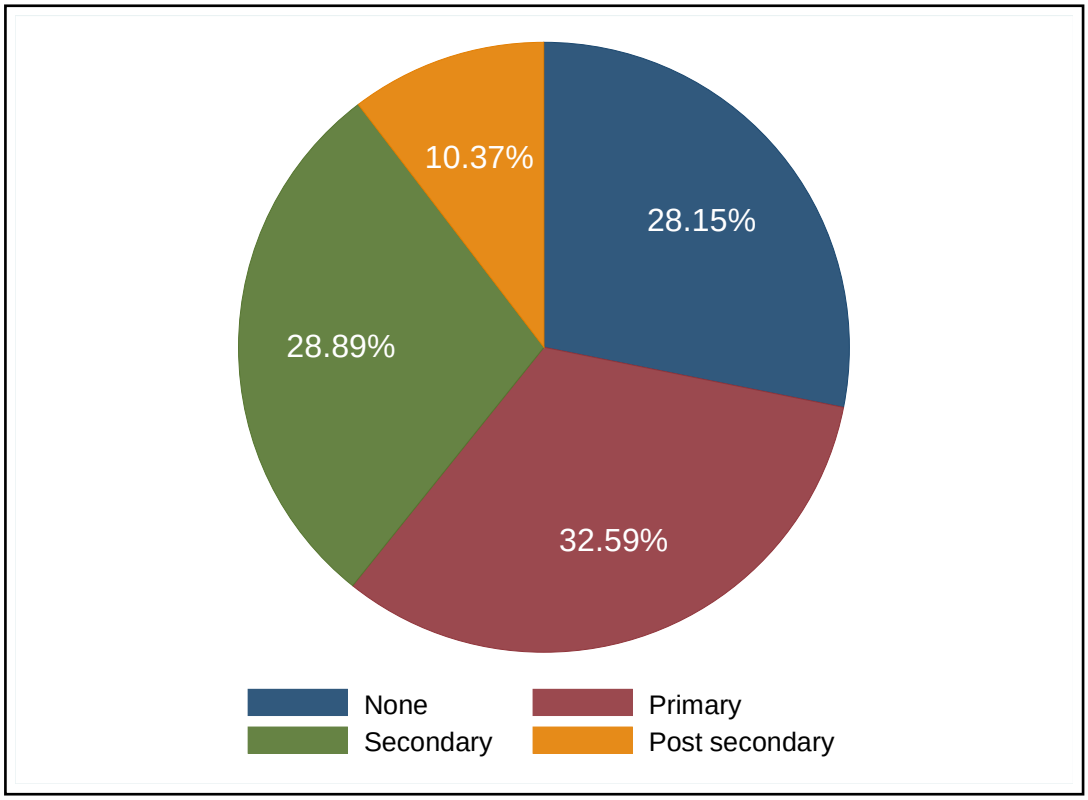

Figure 4.5 Education level of respondents (N=135)

Of all the respondents, 28% (n=38) indicated not having completed primary education, with 33% (n=44) having completed primary education, 29% (n=39) having completed secondary education and 10% (n=14) having completed tertiary education. Out of the enrolled, 47% (n=8) indicated not having completed primary education, 23% (n=4) indicated having completed primary education, 18% (n=3) indicated having completed secondary education and 12% (n=2) having completed tertiary education. This indicates that people with a lower education level (none or primary) are more likely to subscribe to the TCHP than people with a higher education level (secondary or postsecondary).This contradicts other studies, where a higher level of education has been associated with enrolment in CHI (De Allegri 2006a:854). Jehu-Appiah et al (2011:163) note higher education, that is education "above [that of] primary education", as a significant determinant for enrolment in CHI. This appears logical, since highly educated people tend to better understand the underlying principle of health insurance and to better budget their income. This was mentioned by Sarpong et al (2010:195) as the degree of literacy, whereby a low degree of literacy was associated with poor households and low coverage of CHI.

4.3.1.6 Item A6 and Item A8: Respondents' average milk supply per day (N=135)

Both the ‘average milk supply per day’ and item 8: ‘another income source next to milk’, were used in this research as SES indicators. The average milk supply per day differed per enrolment status of the respondents, as depicted in figure 4.6.

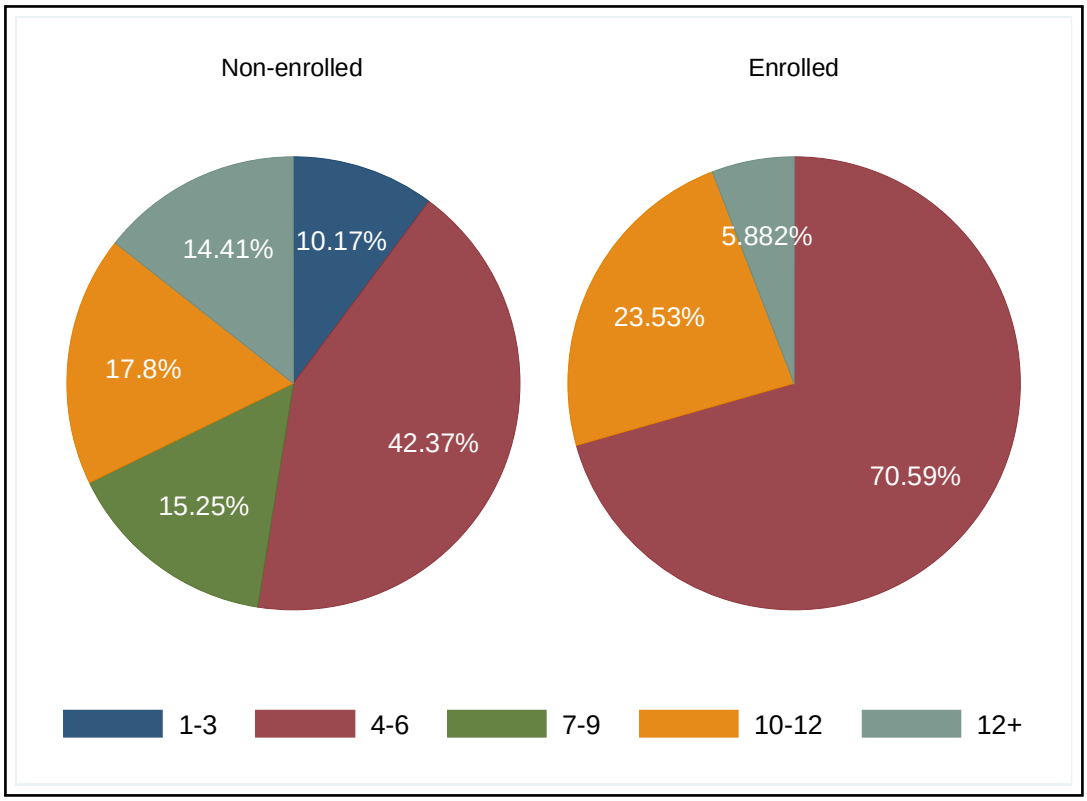

Figure 4.6 Milk supply in litres per day by enrolment status (N=135)

Of the enrolled respondents, 71% (n=12) supplied an average of 4 to 6 litres, 24% (n=4) supplied 10 to 12 litres, and 6% (n=1) supplied more than 12 litres per day. Out of the non-enrolled respondents, 42% (n=50) supplied an average of 4 to 6 litres, 18% (n=21) supplied 10 to 12 litres, and 15% (n=18) supplied 7 to 9 litres, with 15% (n=17) supplying more than 12 litres and 10% (n=12) supplying only 1 to 3 litres per day. Using the average milk supply per day as an SES indicator, figure 4.6 shows that the TCHP does not reach the poorest respondents (milk supply of 1-3 litres), and hardly the better off respondents (6%; n=1). Other studies confirm that poor people are less likely to enrol in a CHI, coining the term “exclusion effect” to describe the phenomenon (Ekman 2004:252; Onwujekwe et al 2010:160; Sarpong et al 2010:195). However, no evidence

was found for exclusion of those groups that were better off. For the higher SES group, there may have been reasons other than financial ability that led to non-enrolment.

4.3.1.7 Item A7: Respondents' milk supply per year (N=135)

Since the majority of the TCHP members pay their premium via their milk account, it was interesting to know if the respondents were able to supply their milk continuously through the year. The respondents' milk supply per year is depicted in figure 4.7 in the number of months out of the past 12 months that they supplied milk to TDPL.

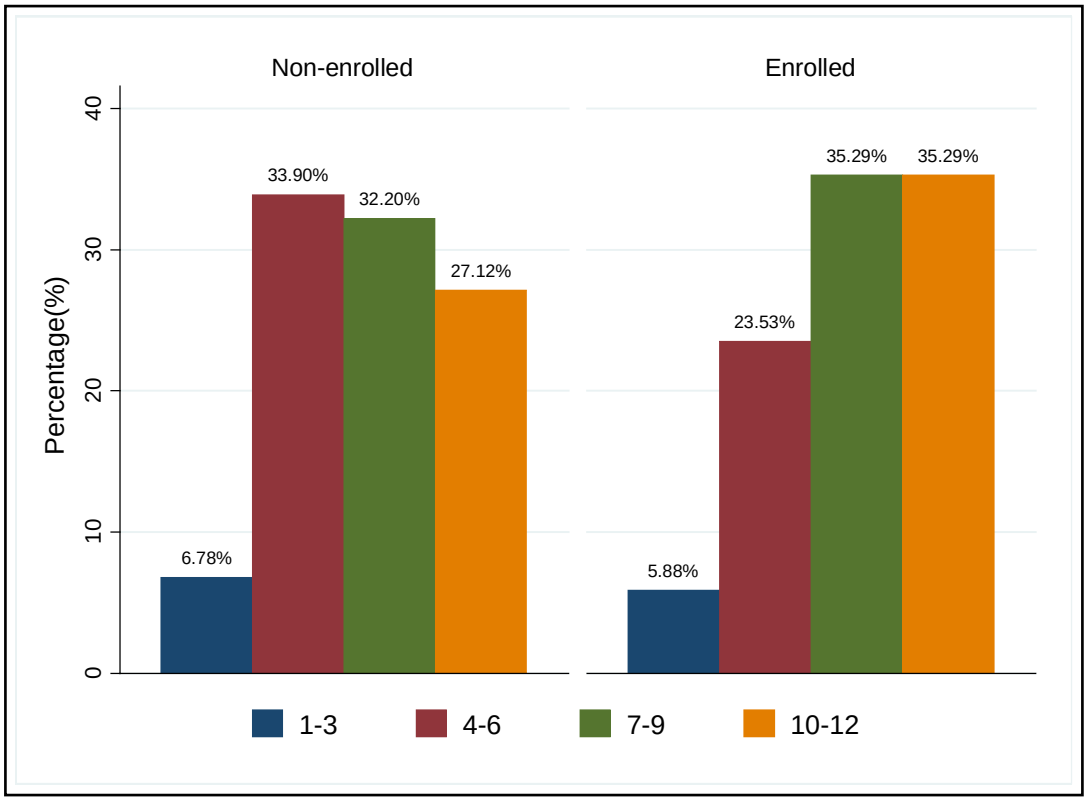

Figure 4.7 Milk supply in number of months over the past 12 months by enrolment status (N=135)

Out of the enrolled respondents, 35% (n=6) supplied milk for 10 to 12 months out of the past year, while for the non-enrolled, 27% (n=32) supplied milk for 10 to 12 months. This means that the majority of the respondents were not able to supply milk continuously to the plant in the 12 months prior to the date that they were interviewed. Reasons for this might be that during the dry season, the cows give less milk, and during the calf-bearing period, the cows dry up. Consequently, TCHP members face

interruptions in paying the premium via their milk account. This is therefore taken as one of the factors influencing enrolment in the TCHP, because TDPL members may indeed foresee their own inability to supply milk consistently throughout the year.

This is a common phenomenon in Sub-Saharan Africa where a large proportion of the population is active in rain-fed agriculture. However, through enrolment in a CHI payment is disassociated from the use of health services, creating a financial buffer between service fees and seasonal fluctuations (Robyn, Hill, Liu, Souares, Savadogo, Sié & Sauerborn 2012:157). Nevertheless the financial buffer of the average TDPL member seems to be too small to bridge the gap of these seasonal fluctuations.

4.3.1.8 Item A8: Other source of income (N=135)

Out of the 135 respondents, 89% (n=120) indicated having an alternative source of income to that of milk supply. It might therefore be supposed that the majority of the respondents had a reasonable income that would enable them to afford the TCHP premium. However, the affordability of the TCHP seemed to be a major problem, according to the two members who left the scheme citing that they were not able to pay the premiums. This was confirmed by the response to the statement on affordability, to be discussed further under 4.3.2.3.

4.3.1.9 Item A9: Other health insurance (N=135)

Out of the 135 respondents, 24% (n=33) indicated having health insurance other than the TCHP. Out of these, 94% (n=31) indicated having health insurance with NHIF, with one respondent insured by CIC Insurance Group Ltd. For one respondent, the record was missing. Out of the 17 study respondents enrolled in the TCHP, 29% (n=5) indicated having health insurance other than the TCHP. This indicates that for respondents, subscribing to another form of health insurance it did not discourage their enrolment in the TCHP. The TCHP might even complement another form of health insurance as NHIF, which, for example, does not cover all outpatient care.

4.3.1.10 Item A10: Enrolment status (N=135)

As indicated in the introduction to this section, 17 out of the 135 respondents were enrolled in the TCHP. Two of these left the scheme, due to not having paid for more than two months. There were no suspended TCHP members included in the sample, who were not able to pay premium for one month. The researcher conducted a convenience sampling recruitment process, and the two members who left the scheme were not purposively included (Burns & Grove 2009:354-355).

The two respondents that had left the TCHP indicated that they had done so for financial reasons. Affordability of the TCHP is discussed under 4.3.2.3.

4.3.1.11 Item A11: Reason of suspension or termination (N=2)

The two respondents that had left the TCPH indicated that they had done so for financial reasons. Affordability of the TCHP is discussed under 4.3.2.3.

4.3.1.12 Item A12: Number enrolled in the TCHP per household (N=15)

Out of the active TCHP enrolees, 27% (n=4) had two to three persons in their household enrolled in the TCHP, 53% (n=8) had four to six persons, while 20% (n=3) had seven or more persons enrolled.

4.3.2 Section B: Factors related to enrolment and non-enrolment

This section dealt with factors related to enrolment and non-enrolment and to what degree the respondents agreed on statements regarding the subject of research.

4.3.2.1 Item B13: Visit of sales executive (N=132)

A small majority (56%; n=74) of the respondents were visited by a TCHP sales executive at home. Of the 17 enrolled, 88% (n=15) were visited by a sales executive. On this item, the data of 3 respondents was missing due to inaccuracies introduced by the interviewer. A visit of a sales executive seems to have had an influence on their enrolment. People respond better when more information is provided on a person to person basis than when in a group. This has thus become one of the marketing strategies of the TCHP (PharmAccess 2010d:21).

4.3.2.2 Item B15: Distance to nearest TCHP Health Centre (N=131)

Out of 131 respondents, 34% (n=45) indicated that they travel at most 30 minutes to the nearest TCHP Health Centre, 45% (n=59) indicated travelling between 30 to 60 minutes and 21% (n=27) travelled more than one hour. Data from four respondents was missing. It is possible to speculate that they did not know of a health centre nearby and therefore could not indicate the distance. Adding the answer category “I do not know” may have overcome this gap in the research. Figure 4.8 depicts the time to travel to the nearest TCHP Health Centre by enrolment status. As shown, enrolled respondents tended to live closer to the TCHP facilities, since 41% (n=7) travel less than 30 minutes to these facilities, as compared to the non-enrolled, where 33% (n=38) travel less than 30 minutes.

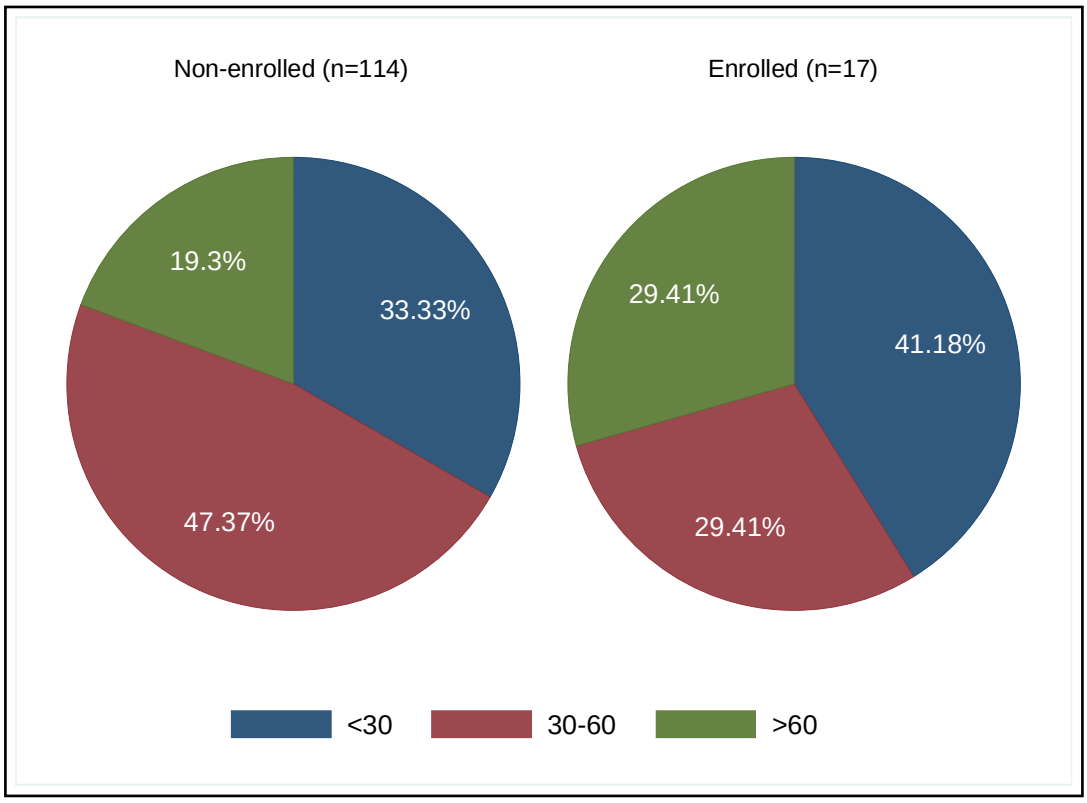

Figure 4.8 Time in minutes to travel to the nearest TCHP Health Centre by enrolment status (N=131)

However, a short distance to a contracted facility does not imply an increased tendency for enrolment. De Allegri et al (2006a:854) indicated the contrary, as greater distance

from the health facility, according to their findings, was positively associated with enrolment in the CHI. Dong et al (2009:177) had a similar finding in their analysis of the reasons for CHI dropout. They found that a shorter distance to the contracted health facility *increased* the dropout rate. The reasons for this were verified by a qualitative study, conducted by De Allegri et al (2006a:1523). The study revealed that those living far from the facility felt that they faced higher nonmedical costs when seeking care, due both to the cost of transport and to the opportunity of seeking care. They therefore came to value CHI as a tool to relieve them from at least of part of the financial burden they faced when becoming ill (Dong et al 2009:177). However, Sarpong et al (2010:195) found that the long distance to the closest health facility clearly correlated with low enrolment.

4.3.2.3 Item B14 and Item B16: Statements on enrolment in the TCHP and CHI (N=135)

Table 4.1 indicates the respondents' level of agreement on statements related to the TCHP and CHI in general. In this table, the categories of the Likert scale: 'agree' and 'strongly agree', were combined with 'disagree' and 'strongly disagree'. Therefore, in the ensuing discussion, the term "agree" is as well including "strongly agree" and the term "disagree" is as well including "strongly disagreed".

Table 4.1 Respondents' level of agreement on statements (N=135)

STATEMENT	ENROLLED in n (%) n=17			NON-ENROLLED in n (%) n=118		
	Disagree	Undecided	Agree	Disagree	Undecided	Agree
1. I know what TCHP is.	0	0	17 (100)	27 (23)	7 (6)	84 (71)
2. I understand how TCHP works.	0	3 (18)	14 (82)	48 (41)	7 (6)	63 (53)
3. I know what is included in the benefit package of TCHP.	1 (6)	1 (6)	15 (88)	39 (33)	21 (18)	57 (48)
4. The benefit package of TCHP is satisfactory.	0	2 (12)	15 (88)	29 (24)	32 (27)	57 (49)
5. TCHP is affordable.	3 (18)	0	14 (82)	47 (40)	28 (24)	43 (36)
6. Paying premium via milk is an attractive payment method.	2 (12)	1 (6)	14 (82)	13 (11)	15 (13)	90 (76)
7. TCHP is well promoted in the community.	2 (12)	1 (6)	14 (82)	18 (16)	21 (18)	99 (66)
8. People talk positively about TCHP.	1 (6)	6 (35)	10 (59)	8 (7)	26 (22)	84 (71)
9. I know how TCHP is set up and managed.	3 (18)	1 (6)	13 (76)	44 (37)	33 (28)	41 (35)

STATEMENT	ENROLLED in n (%) n=17			NON-ENROLLED in n (%) n=118		
	Disagree	Undecided	Agree	Disagree	Undecided	Agree
10. I trust the TCHP management.	1 (6)	3 (18)	13 (76)	20 (17)	41 (35)	57 (48)
11. Health insurance helps people to prevent financial disaster.	1 (6)	1 (6)	15 (88)	2 (2)	4 (3)	112 (95)
12. Health insurance is useful for my family.	0	1 (6)	16 (94)	1 (1)	7 (6)	109 (93)
13. I don't mind contributing money to a healthcare plan and not benefit from it while others do.	2 (12)	0	15 (88)	15 (13)	14 (12)	88 (75)
14. In the last 12 months my household had to pay a lot of money for healthcare and medication.	13 (76)	0	4 (24)	59 (50)	2 (2)	57 (48)
15. I would rather wait and see whether TCHP is a good plan before I enrol.	13 (82)	2 (12)	1 (6)	30 (26)	24 (21)	63 (53)
16. If I become really sick, the community will do a "harambee", so I don't need a health insurance.	13 (76)	2 (12)	2 (12)	96 (83)	8 (7)	12 (10)

From the table regarding the level of agreement on the statements, the following was concluded:

- The majority of non-enrolled respondents (71%; n=84) agreed that they know what the TCHP is and agreed that they understand how the TCHP works (55%; n=63). This means that there was a high level of knowledge and an average level of understanding among non-enrolled respondents. The level of knowledge of enrolled respondents was as high as expected (100% agreement on knowledge and 92% on understanding).
- Almost half of the non-enrolled respondents (48%; n=57) agreed that they know what is included in the benefit package of the TCHP, and agreed that the benefit package of the TCHP is satisfactory (49%; n=49). Of the enrolled respondents 88% (n=15) agreed on knowledge, as well as satisfaction of the benefit package. It was concluded by Jehu-Appiah et al (2011:164) that benefits and convenience had a stronger predictor effect on enrolment than did the cost of premiums.
- Out of the 17 enrolled respondents, 82% (n=14) agreed that the TCHP was affordable for them. This indicates a positive experience of the price/quality ratio for those enrolled in the TCHP. However, among the non-enrolled, 36% (n=43)

agreed and 40% (n=47) disagreed that TCHP is affordable. This means that affordability may indeed constitute a major threshold for enrolment. This finding is confirmed by a study conducted by Onwujekwe et al (2010a:159-161) that people in rural communities are willing to pay less for a CHI than people in urban communities. Of those enrolled, 82% (n=14) and 76% (n=90) of the non-enrolled agreed that paying by means of milk supplied was an attractive method of meeting their premiums. This means that paying premiums via the milk account is, overall, considered an attractive method of payment for the members of the TDPL. Duc et al (2009:106) indicate satisfaction with scheme administration as a positive factor that might help to increase enrolment rates.

- The majority of respondents (enrolled 82%; n=14; non-enrolled 66%; n=99) agreed that the TCHP is well promoted in the community, and agreed that people talk positively about it (enrolled 59%; n=10; non-enrolled 71%; n=84).
- Of the enrolled respondents, 76% (n=13) agreed that they know how the TCHP is set up and managed and that they trust the management. This indicates that for the TCHP members, it is clear how the TCHP is managed, indicating a high level of trust. For the non-enrolled, the management structure is not clear for 65% (n=77) of the respondents 37% (n=44) disagreed; 28% (n=33) undecided. However, 48% (n=57) agree that they trust the TCHP management, despite the high percentage of respondents who attest to not being familiar with the management.
- A high percentage of enrolled (88%; n=15) and the non-enrolled (95%; n=112) agreed that health insurance helps people to prevent financial disaster. A high percentage also agreed that health insurance is useful for their family (enrolled 94%; n=16, and non-enrolled 93%; n=109). This indicated that there is a positive attitude towards CHI among the TDPL farmers and that they tend to understand the basic principle of health insurance.
- To the statement “I don't mind contributing money to a healthcare plan where others benefit from it while I do not”, 88% (n=15) of the enrolled and 75% (n=88) of the non-enrolled responded that they agreed. This indicates that the target population tends to understand the principle of risk pooling (WHO 2011a:2).
- The statement “In the last 12 months my family had to pay a lot of money for healthcare and medication” showed the subjective distribution of high health expenses and thereby the dispersion of the health risk among non-enrolled respondents. Out of the non-enrolled, 48% (n=57) agreed that they had high

health expenditures in the past year, and 50% (n=59) disagreed. Of the enrolled 76% (n=13) disagreed that they had to pay a lot of money. However, 24% (n=4) still agreed, despite being enrolled in the TCHP. Reasons for this might be that they had not been enrolled for a full year yet, or that they had healthcare expenses that were not covered by the TCHP.

- The majority of the non-enrolled (53%; n=63) agreed that they would rather wait to see if the TCHP was a good plan, before choosing to enrol. De Allegri et al (2006c:1525) describe that sentiments of sceptic is mere nurtured by previous bad experiences with collective arrangements. People in rural societies are likely to mistrust new initiatives, because they doubt their institutional capacity, and may therefore be reluctant to invest their limited resources in such schemes unless they have proof of a concrete return. It is not remarkable that 82% (n=13) of the enrolled disagreed with this statement, because they did not wait to see, but chose instead to enrol.
- In Kenya, it is a cultural practice to hold a "harambee", which refers to communal fundraising in case of high health expenditures on the part of a member of that community (Mathauer et al 2008:57). However, the majority of the respondents (83%; n=96 of non-enrolled; 76%; n=13 of enrolled) did not agree that they would hold a "harambee" in the case of serious illness.

From the statements on enrolment in the TCHP and a CHI it can be concluded that the TCHP is positively received in the community and that there is a high level of knowledge on the TCHP and an average level of understanding of the TCHP among non-enrolled respondents. Unaffordability is a major threshold to enrol for 40% of the non-enrolled. TDPL farmers tend to understand the basic principle of health insurance and risk pooling.

4.3.3 Section C: Health services satisfaction

This section dealt with usage of and satisfaction with the services in the health facilities that were contracted by the TCHP.

4.3.3.1 Item C17 and Item C18: Usage of health services (N=62)

Out of the 17 enrolled in the TCHP, 59% (n=10) made use of the health services under the TCHP. The 41% (n=7) TCHP enrolees who did not make use of the services, indicated that they had not fallen sick during enrolment, and one respondent did not know which hospital to go to. Out of the 135 respondents, only 46% (n=62) made use of one of the healthcare facilities that were contracted by the TCHP. They were divided over the facilities, as demonstrated in table 4.2.

Table 4.2 Usage of healthcare facilities (N=135)

HEALTH FACILITY	FREQUENCY in n	FREQUENCY in %
Chepkemel Health Centre	0	0
Chepterwai Health Centre	0	0
Kabiemit Health Centre	15	11
Kaiboi Health Centre	4	3
Kaigat Health Centre	43	23
None of these	73	54
Total	**135**	**100**

Table 4.2 demonstrates that 46% (n=62) of respondents made use of three facilities, namely Kabiemit, Kaiboi and Kaigat Health Centre. They did not make use of Chepkemel and Chepterwai Health Centres, most likely because of their geographical location.

4.3.3.2 Item C19: Health services satisfaction (N=55)

Out of the 62 respondents who used health services, 89% (n=55) respondents were able to indicate their satisfaction. The other 11% (n=7) respondents did not indicate their satisfaction with the health centres, most likely because they did not personally visit the health centre, but for example one of their relatives, or it had been too long ago that they had been there. Table 4.3 shows the level of agreement on health service indicators. It shows that users of the health centres were very satisfied with its services, since 10 out of the 11 statements have 82% or more of the respondents agreeing with the statement. The only statement that scores slightly lower is statement 8 “I do not wait long to get laboratory tests or results”, with 73% (n=40) respondents agreeing. However, this was not due to the fact that respondents were necessarily waiting a long

time for results, as the results indicate that as many as 18% (n=10) of the respondents chose the option “undecided”.

Table 4.3 Health services satisfaction (N=55)

STATEMENT	Valid n	Disagree n (%)	Undecided n (%)	Agree n (%)
1. Health services are available at any time of the day.	55	2 (3)	0	53 (97)
2. Using the TCHP membership card is convenient.	14	1 (6)	0	13 (94)
3. I do not wait long to see a doctor or nurse.	55	4 (7)	3 (5)	48 (88)
4. The doctor or nurse attends to me professionally.	55	0	2 (4)	53 (96)
5. The doctor or nurse attends to me in a friendly way.	55	9 (16)	1 (2)	45 (82)
6. The doctor or nurse takes enough time to examine or treat me.	55	1 (2)	2 (4)	52 (94)
7. The doctor or nurse explains to me well the disease and its treatment.	55	1 (2)	1 (2)	53 (96)
8. I do not wait long to get laboratory tests or results.	55	5 (9)	10 (18)	40 (73)
9. I do not wait long to get prescribed medicines.	55	2 (4)	3 (5)	50 (91)
10. Prescribed medicine are always available.	55	7 (13)	1 (2)	47 (85)
11. I am satisfied with the delivered services of the health centre.	55	1 (2)	1 (2)	53 (96)

By splitting up the statements over the three used health facilities, it is remarkable that of the 4 respondents that visited Kaiboi Health Centre, none of them disagreed on any statement, which indicates that they were all satisfied with the services. Of the 15 respondents that visited Kabiemit Health Centre, disagreement was as low as 7% (n=1) on four statements, and 20% (n=3) indicated, by disagreeing with the statement, that they do wait long to get laboratory tests or results. Out of the 36 respondents that visited Kaigat Health Centre 22% (n=8) disagreed that the doctor or nurse attended to them in a friendly way and 17% (n=6) disagreed that prescribed medicines are always available. Otherwise, the overall satisfaction for the three separate health centres was high.

Within the HIP framework, the operational objective of CHI on quality of care (see 2.6.2.1) was: to improve performance of health services in terms of quality of patient care, productivity, and health services covered. The study results showed that patients

were satisfied with the quality of patient care, the provision of which was part of the CHI objectives.

Health services satisfaction is an important step towards providing continuous high quality healthcare. Quality of care of the contracted providers in a CHI has proved to be crucial for enrolment (De Allegri et al 2006b:65-68). Dissatisfied patients may refuse to renew their membership in the next year (Devadasan et al 2011:45).

4.3.3.3 Item C20: Comments on the TCHP (N=134)

The final qualitative question on the interview schedule was: “Do you have any comments you would like to make about TCHP?” There were 134 respondents commented on this item. The comments were classified through content analysis. Content analysis technique was used to classify words in this text into a few categories chosen because of their theoretical importance in the study findings (Burns & Grove 2009:528). Out of the 134 respondents, 34% (n=47) commented that the TCHP was too expensive, 28% (n=38) commented on the need for more education, sensitisation and promotion; and 21% (n=29) praised the TCHP. Other comments were made on the problem of distance to the healthcare facilities (8%; n=11), healthcare services (5%; n=7) and services of TDPL (4%; n=5).

4.4 FACTOR ANALYSIS

To further analyse the data, factor analysis was conducted. Factor analysis examines interrelationships among large numbers of variables, and disentangles those relationships to identify clusters of variables that are most closely linked together. These clusters of variables are called factors (Burns & Grove 2009:484). Factor analysis was an appropriate method for reducing the multidimensionality of variables measured in a Likert scale (Polit & Beck 2012:363). There were 16 variables associated with enrolment measured on a Likert scale in section 4.3.2.3 as reflected in the interview schedule (Annexure F). For the purposes of factor analysis, these variables were referred to as follows:

- V1: I know what TCHP is
- V2: I understand how TCHP works

- V3: I know what is included in the benefit package of TCHP
- V4: The benefit package of TCHP is satisfactory
- V5: TCHP is affordable
- V6: Paying premium via milk is an attractive payment method
- V7: TCHP is well promoted in the community
- V8: People talk positively about TCHP
- V9: I know how TCHP is set up and managed
- V10: I trust TCHP management
- V11: Health insurance helps people to prevent financial disaster
- V12: Health insurance is useful for my family
- V13: I don't mind contributing money to a healthcare plan and not benefit from it while other do
- V14: In the last 12 months my household had to pay a lot of money for healthcare and medication
- V15: I would rather wait and see if TCHP is a good plan before I enrol
- V16: If I become really sick, the community will do a harambee so I don't need a health insurance plan

To conduct a factor analysis, a minimum sample of 50 is required, but more than 100 is preferable. Moreover, according to Habing (2003:3), the sample size should be at least 5 times the number of the variables. In this research, there were 16 variables eligible for factor analysis, meaning that at least a sample of 80 was necessary to conduct factor analysis on 16 variables. A sample size of 135, consisting of 16 variables, was decided as appropriate for conducting factor analysis. Factor analysis was not appropriate to reduce the variables associated with health services satisfaction in section C (table 4.3), because only 55 respondents responded to the 10 variables.

4.4.1 Correlation matrix

The first step in exploratory factor analysis was the development of a correlation matrix of the scores (Burns & Grove 2009:485). The matrix was developed with the Stata software package. The loadings or weights represented the correlations between the common factor (F) and the input variables. To continue with factor analysis, it was necessary for the correlation matrix to contain 2 or more correlations of 0.3 or greater

(Habing 2003:3). The correlation matrix demonstrated that 9 out of the 16 variables had a correlation of more than 0.3 in absolute value. Table 4.4 shows the 9 remaining variables, where the other 7 variables with a correlation less than 0.3 were left omitted.

Table 4.4 Correlation matrix of the remaining variables

VARIABLE	V1	V2	V3	V4	V6	V9	V10	V12	V13
V1	1								
V2	-0.3225	1							
V3	-0.1369	-0.6136	1						
V4	-0.2832	0.0111	-0.2546	1					
V6	0.2027	-0.0425	-0.0373	-0.3832	1				
V9	0.0878	-0.1005	-0.1273	-0.1118	-0.0388	1			
V10	0.0387	-0.1329	0.039	-0.1964	-0.1432	-0.3705	1		
V11	-0.0592	0.0515	-0.0738	0.1628	-0.1033	0.0094	-0.1482	1	
V12	0.0832	-0.0575	0.0622	-0.0553	0.0886	-0.1185	0.0547	-0.6241	1

The overall Keiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.813. This confirmed that factor analysis was appropriate to reduce multidimensionality of the data set.

4.4.2 Principal components analysis

The second step was a principal components analysis, which provided the preliminary information that the researcher needed to make decisions before the final factoring (Burns & Grove 2009:485).

The table of the principal components analysis gave the eigen values, the amount of variance explained by each factor, and the weight for each variable of each factor. Weights or loadings express the extent to which the variable is correlated with a given factor. Weightings on the variables from a principal components factor analysis were essentially uninterpretable, and were generally disregarded (Burns & Grove 2009:485; Garett-Mayer 2006:23).

Eigen values are equal to the sum of the squared item weights for the factor (Polit & Beck 2012:363). The researcher together with a statistician examined the eigen values to decide how many factors would be included in the factor analysis. To decide the numbers of factors to include, it was necessary to determine the minimal amount of variance that must be explained by the factor that would add significant meaning (Burns & Grove 2009:485). There are several strategies for determining the number of factors to be included in the construct. One approach is utilising the Kaiser's Criterion, where factors are selected that have an eigen value of 1.00 or above (Burns & Grove 2009:485; Habing 2003:4; Polit & Beck 2012:363). Running the principal component analysis resulted in two factors, with an eigen value of at least 1.0. Another strategy used was the scree test. Scree is a geological term, referring to the debris that collects at the bottom of a rocky slope. This test, which is considered by some to be the most reliable, is depicted in figure 4.9 whereby all 16 variables were inserted (Burns & Grove 2009:485; Garett-Mayer 2006:37).

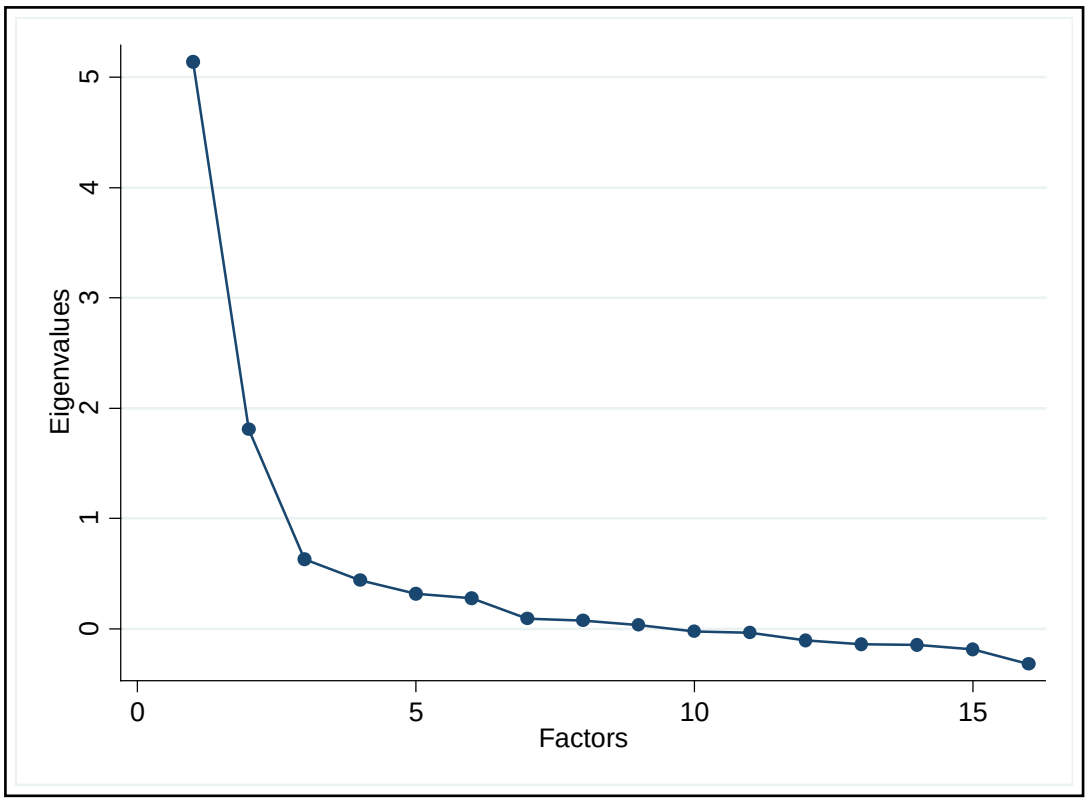

Figure 4.9 Scree plot of eigen values from the factor analysis

This graph shows a change in the angle of the slope. A steep drop in value from one factor to the next indicated a large difference in score between the two factors and an increase in the amount of variance explained. When the slope begins to become flat, which is an indication of a small difference in the scores between factors, little additional information would be obtained by including more factors. In figure 4.9, the slope began to flatten at factor 3. For this reason, two factors were extracted to explain the concept, confirming the method of the Kaiser's Criterion (Burns & Grove 2009:485).

4.4.3 Factor rotation

The third step in exploratory factor analysis is factor rotation. Factor rotation simplifies the factor structure, and the procedure most commonly used is referred to as varimax rotation. In varimax rotation, the factors are rotated for the best fit, and are uncorrelated (Burns & Grove 2009:485-486).In this instance, this resulted in factor loadings for two factors, as demonstrated in table 4.5.

Table 4.5 Factor loadings for two factors

Variable	Factor I	Factor II	Uniqueness= $1-(h)^2$= 1-communality
1. I know what TCHP is.	0.75	-0.04	0.43
2. I understand how TCHP works.	0.91	0.04	0.16
3. I know what is included in the benefit package of TCHP.	0.90	0.03	0.19
11. Health insurance helps people to prevent financial disaster.	0.05	0.72	0.48
12. Health insurance is useful for my family.	-0.00	0.72	0.48

4.4.3.1 Factor loading

A factor loading is actually the regression coefficient of the variable on the factor. In table 4.5 the factor loading indicates the extent to which the single variable is related to the cluster of variables (Burns & Grove 2009:486). In variable 1, the factor loading is 0.75 for factor I and -0.04 for factor II. Squaring the factor loadings ($[0.75]^2$=0.5625, and $[-0.04]^2$=0.0016 gave the amount of variance in variable 1, which explained factors I and II.

4.4.3.2 Communality

Communality (h^2) is the squared multiple regression coefficient for each variable. Thus, the communality coefficient describes the amount of variance in a single variable explained across all the factors in the analysis (Burns & Grove 2009:486). The communality for a variable was obtained by summing the squared factor loadings on the variable for each factor. In table 4.5, the communality coefficient for variable 1 was $(0.75)^2+(-0.04)^2=0.56$.

4.4.3.3 Uniqueness

Uniqueness is the variance that is unique for each variable and not shared with other variables. It is equal to 1 minus communality (variance that is shared with other variables). For example, 48% of the variance in “Health insurance helps people prevent financial disaster” is not shared with other variables in the overall factor model. On the contrary “I understand how TCHP works” has a low variance not shared with other variables (16%). The greater the ‘uniqueness’ (uniqueness >50%), the lower the relevance of the variable in the factor model. Table 4.5 does not have a variable with uniqueness greater than 50%, showing the high relevance of the variables in the factor model (Garett-Mayer 2006:54).

4.4.3.4 Naming the factors

Table 4.5 showed that the first three measured correlated variables explain over 50% of the variability in factor I, while the last 2 explain over 50% of the variability in factor II. Thus, there were two uncorrelated latent variables explaining two different characteristics of the data. The next step was to name these factors in order to identify the broad construct of meaning that has caused these particular variables to be so strongly inter-correlated (Burns & Grove 2009:486). Due to the meaning captured by the variables, the researcher decided to term factor I: "information provision" and factor II: "understanding CHI". It is interesting to note that Basaza et al (2008:172) identified these factors as barriers to low enrolment in a CHI. They identified them as:

- lack of basic information on the scheme’s design and operation
- limited understanding of the principles underlying CHI

The two factors now explained the 16 variables, and were manageable in the subsequent analysis. The predicted scores "information provision" and "understanding CHI" were uncorrelated, and each had a mean of 0.

Table 4.6 Factor variance

Factor	Variance	Difference	Proportion	Cumulative
Information provision	2.21	1.18	0.77	0.77
Understanding CHI	1.03	-	0.36	1.13

Table 4.6 shows the two identified factors that were retained in order to reduce the data. The two factors were the only factors that had at minimum variance (eigen value) of 1. The two factors accounted for 1.13% of the variance in the data.

4.4.4.4 Logistic regression

Logistic regression analyses the relationship between multiple independent variables and a dependent variable and yields a predictive equation (Polit & Beck 2012:447-448). Logistic regression was conducted in order to predict the chance of enrolment in the TCHP. Logistic regression transformed the probability of an event (enrolment in the TCHP) into its odds. Odds reflect the ratio of two probabilities: the probability of an event occurring, in relation to the probability that it will not occur (Polit & Beck 2009:448). In table 4.7, the two factors "information provision" and "understanding CHI" were included as covariates in the logistic regression model, where OR stands for odds ratio and CI for confidence interval.

Table 4.7 Logistic regression model

	Unadjusted	Adjusted
Enrolled	**OR (95% CI)**	**OR (95% CI)**
Milk (>6 vs. <=6)	0.46 (0.15-1.39)	0.22 (0.06-0.84)
Information provision	5.05 (1.92-13.30)	8.77 (2.25-34.16)
Understanding CHI	0.87 (0.46-1.65)	0.45 (0.19-1.09)
Sales executive visit (yes vs. no)	0.14 (0.03-0.64)	4.9 (0.84-28.82)

The factors associated with enrolment were identified through fitting a logistic regression model. In this model, the quantity of supplied milk, which is an indicator of

SES, was included. Milk supply was grouped as those supplying more than six litres and those supplying at best six litres a day. Furthermore, a visit by a TCHP sales executive (yes versus no), information provision, and an understanding of CHI, were included.

The adjusted effect of the quantity of daily milk supply was strongly associated with enrolment (OR: 0.22; 95% CI: 0.06-0.84). This meant that farmers supplying more than six litres of milk per day were 78% less likely to be enrolled, compared to those supplying less than six litres per day. This is notable, and means that the TCHP is able to reach those farmers with low SES. Although the CHI concept was originally intended to reach the poorest of the poor, the practice of most CHI schemes shows that poor people are less likely to enrol (De Allegri & Sauerborn 2007:1282). Within the HIP framework, this means that the TCHP seems to meet the CHI objective on social inclusion (see 2.6.2.1). This objective stated: "to stimulate enrolment of various groups of the population in the health insurance scheme, specifically the poor and vulnerable, taking into account their financial situation, gender, or other factors that can hinder participation in the CHI "(Van den Broek et al 2011:3).

The variables "visit by a sales executive" and "information provision" showed no association with rate of enrolment. Understanding CHI showed there was a tendency towards a low enrolment rate for every unit increase in the scores, while a visit by the sales executive showed that there was a tendency towards higher chances of enrolment.

Information provision was significantly associated with enrolment in the TCHP (OR: 8.77; 95% CI: 2.25-34.16). A unit increase in the score of information provision caused almost nine times increase in the odds of enrolment. The precision of this estimate, however, may be low because of the small sample size.

4.4.4.5 Cronbach's alpha

After the factor analysis, a reliability analysis was undertaken to calculate Cronbach's alpha. Cronbach's alpha, also called coefficient alpha, is a widely used reliability index that estimates the internal consistency of a scale. It provides an estimate of the proportion of variance in the scale scores that is attributable to the true score, and is

thus a key indicator of the scale's quality (Polit & Beck 2012:367, 724). The overall alpha for the scale was found to be 0.85, which is considered very good (Field 2009:677).

4.5 CONCLUSION

This chapter discussed the data presentation, analysis and interpretation, with the use of descriptive and inferential statistics. Descriptive statistics were presented in the form of percentages, frequencies, tables, bar graphs and pie charts. Inferential statistics were used to identify relationships between and among variables. Exploratory factor analysis was used to reduce the multidimensionality of the data. Variables were reduced to two factors, namely “information provision” and “understanding CHI”. Logistic regression was conducted to identify the factors associated with enrolment in the TCHP. Farmers who supplied more than six litres of milk per day were less likely to be enrolled when compared to those supplying less than six litres per day. A visit of a TCHP sales executive increased the chances of enrolment, and information provision was strongly associated with enrolment in the TCHP.

Chapter 5 concludes the study, discusses its limitations and makes recommendations to the management regarding enrolment in the TCHP in order to improve quality of health of farmers and their families.

CHAPTER 5

CONCLUSIONS, SCOPE AND LIMITATION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter discussed the results, conclusions and scope and limitations of the study and made recommendations to the management of the TCHP, in order for it to provide better access to healthcare for dairy farmers in Nandi North District in Kenya. The study results were discussed in relation to the health insurance action cycle which consisted of internal reflection on the TCHP scheme applying deductive thinking. This internal reflection was done by measuring the progress towards achieving the objectives of the study in relation to that of TCHP and the CHI objectives deducted from the HIP framework. The SWOT analysis matrix was also used as a framework to plot the results as discussed. This reflection assisted in formulating recommendations to the TCHP management.

5.2 RESEARCH OBJECTIVES

The objectives of the study were to:

- determine and describe factors that influence enrolment by dairy farmers in a CHI scheme for better access to healthcare
- generate evidence based information on significant factors that influence dairy farmers to enrol in an insurance scheme that can be used to make recommendations to the TCHP management on how to improve the CHI

5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH RESULTS

A structured interview schedule (Annexure E) was used to collect data. The items on the interview schedule covered broad areas, such as socio-demographic characteristics, factors related to enrolment or non-enrolment and satisfaction of the respondents with the health facilities contracted by the TCHP. Nevertheless, significant

differences and relationships were detected by conducting factor analysis and logistic regression.

5.3.1 Conclusions with regard to socio-demographic characteristics

The results of this study revealed that although slightly more males (54%; n=73) than females participated in the study, they both take decisions on healthcare as household heads in this context. Contrary to the results, in Africa, household heads, who are commonly men, are key decision-makers when it comes to the allocation of economic resources and have a prominent voice in the decision to enrol in a CHI (De Allegri et al 2006b; Robyn et al 2012:159).

The study found that the average age of the TCHP-enrolled tended to be higher than that of the non-enrolled. Of the TCHP enrolled, 41% (n=7) were above the age of 55, while the age of the non-enrolled 24% (n=29) was above the age of 55. Because the sample size was so small, it cannot be deduced that there is evidence of adverse selection. Examples from literature suggested that mandatory enrolment can completely avoid the problem of adverse selection. It has been implemented in Ghana and Rwanda. However, the current situation in many other low income countries, like Kenya, makes it almost impossible to implement it in near future (Parmar et al 2012:187). When mandatory enrolment is not an option, group enrolment can be an alternative. If group enrolment is properly enforced, adverse selection can be reduced as it will ensure that all group members of all ages, sick and healthy, enrol (Parmar et al 2012:187; Wang, Zhang, Yip & Hsiao 2006:1244).

Out of the socio-demographic characteristics examined, only the quantity of daily milk supply was discovered to be highly associated with enrolment (OR: 0.22; 95% CI: 0.06-0.84). This was identified through fitting a logistic regression model, whereby farmers supplying more than six litres of milk per day were 78% less likely to be enrolled, compared to those supplying less than six litres per day. This confirmed that the TCHP reaches those farmers with a low SES. Although the CHI concept was originally intended to reach the poorest, the common practice of most CHI schemes shows that poor people are less likely to enrol (De Allegri & Sauerborn 2007:1282). It is encouraging for the HIF, the initiator of the TCHP, to find that the TCHP reaches

farmers with a low SES, as it accomplishes their aim of developing health insurance schemes for lower income groups.

5.3.2 Conclusions with regard to factors related to enrolment

By making use of factor analysis, the multidimensionality of the 16 variables related to enrolment was reduced to two main factors, namely "information provision" and "understanding CHI". Although it seemed logical that information provision and understanding of CHI would be crucial for enrolment, this is not often identified in the literature as such. From the literature reviewed, it was only confirmed by a qualitative study in Uganda conducted by Basaza et al (2008:174) that "lack of information and poor understanding of the concept of CHI" is an explanation or reason of low enrolment in CHI.

Information provision

The factor ‘information provision’ was significantly associated with enrolment in the TCHP. One of the ways of providing information on the TCHP is by having sales executives visit households of potential members. Logistic regression showed that a visit of a sales executive increased the chances of enrolment in the TCHP, as they provide first-hand information and answered potential client’s questions.

The research results showed that the level of knowledge on the THCP was fairly high, even under non-enrolled respondents. Nevertheless, in the open qualitative comments at the end of the interview the major themes identified were on the need for more education, sensitisation about the scheme and its promotion. This pointed to a lack of information provision on the scheme which is necessary to enable the target group to make decisions on issues of enrolment.

A study on enrolment in NHIF in Kenya conducted by Mathauer et al (2008:65) revealed that a lack of knowledge was the most critical barrier to enrolment. The choice of a health insurance is different from the choice of a healthcare provider, since consumers choose a health insurance prior to becoming ill, based on the available information (Kolstad & Chernew 2009:28). Basaza et al (2008:182) with regard to CHI, indicate that overall education and promotion is needed to increase understanding of the benefits

and management of a CHI. Information on health insurance that consumers generally value is information on access to specific doctors, costs, quality of providers, provider communication skill, courtesy and administrative burden of a plan (Kolstad & Chernew 2009:37). De Allegri et al (2009:593) add that in Africa where the concept of insurance is often foreign to the tradition, culturally sensitive interventions are urgently needed to explain how a CHI works in practice and what the benefits derived from membership are. Investments should therefore be made to expand and sustain relevant social marketing campaigns and other targeted initiatives to increase knowledge on CHI (De Allegri et al 2009:593).

Understanding CHI

The second main factor, resulting from the factor analysis, was the understanding of the principle of CHI. The logistic regression model showed that there was no positive association between understanding CHI and enrolment. This might have been caused by the small sample size. However, the level of agreement on the two statements related to understanding CHI was high for both the enrolled and the non-enrolled group. This seemed to indicate that there was a high level of understanding of the CHI concept and its usefulness. The statement on the concept of risk pooling showed that the target population understood the principle of risk pooling (WHO 2011a:2). Nevertheless, the high level of understanding this principle did not lead to high enrolment rates. This confirmed the results of Basaza et al (2008:182) who found that a good understanding of CHI principles, per se, will not directly translate into increased enrolment. It was as well confirmed by the results of Jehu-Appiah et al (2012:231) who found that households showed a good understanding of the principles and risk sharing concepts of insurance and health. They thereby concluded that low enrolment is not necessarily the result of failure to understand the concept of health insurance, but is more likely a result of other factors, such as household preferences. This showed the complexity of CHI enrolment. Ndiaye et al(2007:160) described that introducing health insurance in African societies and different cultural and rural settings, where households and health needs are multiple and pressing, and where insurance is altogether a new cultural concept; may be a difficult and complex undertaking.

As much as factor analysis reduced the multidimensionality of the variables to two main factors, each of the independent variables helped to explain other significant study results, as discussed in the following paragraphs.

Affordability

The majority of the enrolled respondents agreed that the TCHP was affordable, which indicated positive experience of the price/quality ratio for those enrolled in the TCHP. However, among the non-enrolled, 40% (n=47) disagreed that the TCHP was affordable. This enhanced the findings of De Allegri et al (2006c:1522) and Mathauer et al (2008:65), where non-enrolled individuals identified a lack of financial means as one of the primary reason for not joining the scheme. A policy implication might be to subsidise the premium to facilitate the enrolment of the very poor (Gnawali, Pokhrel, Sié, Sanon, De Allegri, Souares, Dong & Sauerborn 2009:221).

Community entry

The majority of enrolled and non-enrolled respondents agreed that the TCHP was well promoted in the community, and agreed that people talk positively about it. This is positive feedback for the TCHP, and serves as evidence of the success of their marketing strategy that included the involvement of the community in the development of the TCHP especially farmers with a low SES.

Kolstad and Chernew (2009:33) indicate that experiences of others, such as friends, co-workers or family, are crucial for the reputation of a health insurance plan. The more people can identify with people inside the plan, the higher chances of enrolment are. Identification can be attributed to geographic area, age, household composition and SES (Kolstad & Chernew 2009:37).

De Allegri et al (2006b:59, 69) concurs with the results by indicating that understanding consumer's preferences, monitoring them over time and meeting them to the extent that it is possible, can determine the success of a CHI scheme. This approach should be considered as a partial solution to the issue of maximising enrolment in CHI.

The TCHP management

Viable management is essential to sustainable CHIs and creates trust in the community to attract and keep clients. A good organisational structure of a CHI depends on community participation, local ownership and autonomy in decision making (Baltussen et al 2006:655-657). Generally the level of trust in financial organisations stands out clearly as a key factor affecting enrolment in CHIs (Basaza et al 2008:177). Thus weak managerial capacity of a CHI is a major operational limitation to its successful development (De Allegri et al 2009:591). The moderate levels of knowing and trusting the TCHP management, as was evidenced in this study, therefore continues to be an issue of challenge to enrolment in a CHI and needs attention.

Socio-cultural practices

One of the cultural beliefs that influences enrolment in CHIs in Africa is that setting money aside for healthcare may be perceived as attracting diseases (Baltussen et al 2008:182). In the context of this study it is local cultural practice to hold a "harambee" fundraising (Mathauer et al 2008:57), in cases of high health expenditure. The majority of the respondents did not agree beforehand that they would hold a "harambee" in the case of serious illness, when they were directly asked for their opinion.

In the rural area of Nandi North District a novel initiative as the TCHP is likely to face scepticism and mistrust, like in other rural African societies. This mistrust and scepticism may disappear if TCHP management proves to carry out its work professionally and ethically (De Allegri et al 2006c:1525). By ensuring that the TCHP is trustworthy and beneficial, enrolment rates could increase.

Accessibility

The TCHP was implemented in the rural area of Nandi North District where distances from homesteads to contracted TCHP health centres are long. Although some studies (De Allegri et al 2006a:854; De Allegri et al 2006c:1523; Dong et al 2009:177) found that the long distance to a health facility was not negatively associated with enrolment in a CHI, Sarpong et al (2010:195) suggested the contrary. Their study found that a long distance to the closest health facility clearly correlated with low enrolment. Moreover,

they indicated that people who live far from health facilities have lower health services and lower utilisation rates. If these members have to pay identical premiums as those members living close to these services, they indirectly subsidise the insurance scheme. Sarpong et al (2010:195) therefore recommend including the distance to the nearest contracted health facility as a criterion for determining premium levels. Basaza et al (2008:181) suggest the same, indicating that the homesteads near the hospital could pay more than those at a far distance.

5.3.3 Conclusions related to health services satisfaction

Satisfaction with health services is an important step towards providing continuous, high quality healthcare (De Allegri et al 2006b:65-66, 68). “Good healthcare close at hand”, is one of the slogans in the information brochure on the TCHP (TCHP 2011b). By upgrading five health centres in Nandi North District, quality healthcare has indeed arrived close at hand, not only for the enrolled, but also for the non-enrolled. For example, in Chepkemel Health Centre, there was previously no maternity service. Since the health centre is contracted with the TCHP, there is maternity provision with trained personnel. In case of any complication, a TCHP-enrolled member can make use of an ambulance, and can be transferred to Moi Teaching and Referral Hospital in Eldoret. This has direct positive implications for maternal health in Nandi North District. Results from a study of Gnawali et al (2009:218) showed that CHIs have the ability to improve healthcare utilisation for both enrolled and not-enrolled in a CHI. However, improved quality of care of a contracted health facility might as well prevent people to enrol in the CHI, because they already receive good quality healthcare, although they are not enrolled.

The overall satisfaction for the three used TCHP health centres of Kabiemit, Kaiboi and Kaigat was high among both enrolled and non-enrolled respondents. Although there was no significant difference in satisfaction level found between these groups, this section is included to compare this finding and the objectives of TCHP. This result was confirmed by a research study conducted by Devadasan et al (2011:45) that found that both CHI-enrolled and non-enrolled respondents expressed a high level of satisfaction with health service levels, where there was no significant difference between both groups. Quality of care of the contracted providers in a CHI has proved to be crucial for

enrolment, because dissatisfied patients may refuse to renew their membership in the next year (De Allegri et al 2006b:65-66, 68; Devadasan et al 2011:45).

Mohammed, Sambo and Dong (2011:1-2) indicate that dissatisfaction arises where providers deny enrolled patients their full entitlement or charge additional fees on the pretext of non-inclusion of the service in the benefit package. Other complaints are related to poor attitude and behaviour of service providers operating in the CHI. Mohammed et al (2011:2) therefore suggest to regularly assess the appropriateness of care and client satisfaction. In that way problems with health service provision can be understood and rapidly resolved at all times.

If CHI schemes want to improve the quality of care for their clients so that they adhere to the scheme, the scheme managers need to negotiate actively for better quality of care with contracted health service providers (Devadasan et al 2011:47).

5.4 INTERNAL REFLECTION OF THE TCHP

The TCHP objective and the CHI objectives deducted from the HIP framework were related to the objectives of this study on factors that were identified to be influential in enhancing enrolment to a CHI. Deductive reasoning was applied to relate the TCHP objectives and the results of the study. Deductive reasoning according to Burns and Grove (2009:10), moves from the general to the specific or from a general premise to a particular situation or conclusion as is in this context.

5.4.1 Measuring the TCHP key objective

PharmAccess states that “TCHP is a member-driven healthcare plan whose key objective is to provide accessible, affordable and quality healthcare that supports the realisation of economic prosperity for farmers and their families” (PharmAccess 2010c:12). To measure the key objective of the TCHP, questions on accessibility, affordability and quality of healthcare were posed in the interview schedule, and its outcomes were related to the research results. Long distances were reported to have a negative influence on enrolments. The non-enrolled, 40% (n=47) were of the opinion that the TCHP was not affordable and that the premiums of the TCHP were too expensive for them. As reported in these results, the accessibility and the affordability of

healthcare seemed not satisfactory. However, the quality of healthcare, as measured by health services satisfaction responses was of a high standard and positively reported on.

5.4.2 Measuring the CHI objectives

Within the HIP framework, six CHI objectives were stated. These objectives were on financial protection, financial resource mobilisation, quality of care, utilisation of care, community empowerment and social inclusion (Van den Broek et al 2011:3). Based on the CHI objectives, the evaluation of the study objectives was applied to the TCHP.

Financial protection

Financial protection is aimed at protecting insured clients or patients against high out-of-pocket and catastrophic health expenditures. As of September 2012, there were 412 valid TCHP members. These members together with their families numbered 1366 individuals. All of these individuals were protected against out-of-pocket and catastrophic health expenditures. However, Dekker and Wilms (2010:375) found that health insurance cannot offer households full protection against the direct financial effects of health risks. The availability of cash to meet, for example, transport costs, user fees, exclusions from the health package or the health insurance premium, remains problematic and is an important reason for household borrowing or the selling of assets. In this study, premiums were paid by milk supply. Financial protection is still a challenge as majority of those enrolled are of the lower SES.

Financial resource mobilisation

Financial resource mobilisation is aimed at mobilising more sustainable funds to cover healthcare costs. The HIF addresses both the demand and the supply side of a healthcare system. On the demand side, enrolment in a healthcare scheme is encouraged where the HIF subsidises apart of the member contribution to the health insurance. On the supply side, financial risk is reduced where the HIF introduces constant and predictable revenue streams. This improves the investment situation and therefore provides opportunities to develop capacity and improve quality. Ultimately, HIF aims for access to affordable and quality healthcare. This implies capacity improvement

of all local stakeholders involved in the healthcare financing and delivery system, such as insurance companies, administrators, healthcare providers and target group organisations (PharmAccess 2010a:8). CHIs often operate in economic environments of very limited resources, leading to challenges in achieving financial and organisational sustainability. Low enrolment rates, as is evidenced in this study, endanger the sustainability of a CHI, constraining the risk pooling function of insurance (Robyn, Sauerborn & Bärnighausen 2012:9). A solid risk pool capable of insuring its members adequately should consist of a sufficient number of members. The higher the volume of prepaid health insurance contributions, the higher the chances of an independent, sustainable CHI, whereby access to care is secured. The percentage of the population covered is therefore an indicator of the general attractiveness of the scheme and measures the extent to which the scheme is viable (Carrin et al 2005:800-801).

Quality of care

The CHI objective for quality of care was to improve performance of health services in terms of the quality of patient care, productivity, and health services covered. The high quality of care was confirmed by the results of this study. The implementers of the TCHP choose to upgrade healthcare facilities and to monitor the facilities over time. This is described by a literature review on CHIs in India by Michielsen, Criel, Devadasan, Soors, Wouters and Meulemans (2011:482), as a way of guaranteeing quality care. However they indicate that providing quality healthcare in rural areas is a challenge, where the freedom of choice especially for poor people is limited. Treats in ensuring quality healthcare can be found in:

- corruption
- fraud
- discrimination at the provider to patient interface
- providers releasing required medical reports only after asking ‘processing fees’\
- overcharging and rude treatment of members
- providers prescribing unneeded and harmful treatment
- providers asking informal payments

In general most schemes lack the capacities to negotiate successfully with providers, insurance companies, professional associations and government over quality standards, price negotiations and accountability mechanisms (Michielsen et al 2011:482).

Utilisation of care

The operational objective on the utilisation of care was to increase utilisation of contracted healthcare services by the insured clients of the health insurance scheme. It was assumed that the TCHP members had an increased utilisation of the health centres contracted by the TCHP. However, of the 17 participants interviewed that were TCHP-enrolled, 41% (n=7) had not yet made use of health services under the TCHP at the time of the interview. Nevertheless the upgraded health centres under the TCHP seem to attract uninsured patients, evidenced by higher patient attendance. This is a positive side-effect on the utilisation of health services for these health centres. However Gnawali et al ((2009:218) indicate that households who perceived good quality of care were less likely to enrol in the CHI scheme. Moreover their analysis suggests that CHI has the ability to improve healthcare utilisation, but the benefits of CHI may not be distributed evenly among groups with different SES (Gnawali et al 2009:218).

Community empowerment

The social objective for community empowerment was to empower community members and individuals, by gaining control over the factors and decisions that affect their health. In relation to health insurance, this can be practiced by enabling the community to become a respected stakeholder in the local healthcare system. PharmAccess has tried to involve the community from the beginning in the development of the TCHP, as evidenced by the positive community entry and continues involving the community in the improvement of their CHI.

Social inclusion

The objective with regards to social inclusion was to stimulate the enrolment of various groups of the population in the health insurance scheme, specifically the poor and vulnerable, taking into account their financial situation, gender, or other factors that can

hinder participation in the CHI. It was a positive observation to see that the results of this study showed that the TCHP reached women, the poor and less educated segment of the target population. However, Soors, Devadasan, Durairaj and Criel (2010:97) indicate that after all CHI is not an (affordable) option for the poorest and the destitute. Unless somebody else pays for them, they will never be able to join a CHI scheme and remain unprotected.

5.4.3 SWOT analysis of the TCHP

The description of research results in relation to factors that influence enrolment in the TCHP assisted in performing a SWOT analysis. SWOT stands for strengths, weaknesses, opportunities and threats. The SWOT analysis helped to identify helpful and harmful factors, as well as factors in the internal and external environment of the programme (Van den Broek et al 2011:13; Van Wijngaarden, Scholten & Van Wijk 2012:35). Based on the discussion of the results of this study, the SWOT matrix was developed as exhibited in figure 5.1.

	Helpful factors to achieve objectives	*Harmful factors preventing achievement of objectives*
Internal factors	**Strengths** - Satisfactory level of understanding of CHI principle and its usefulness - Paying premium via milk supply - Positive community entry - Trust in the TCHP management - Satisfaction with the quality of health services - Satisfaction with benefit package	**Weaknesses** - Lack of information provision on the TCHP - The TCHP was not affordable for 40% of the non-enrolled - Unfamiliarity with the TCHP management - Prohibitive distances to the nearest TCHP health centre
External factors	**Opportunities** - More education, sensitisation and promotion - Wait to see whether the TCHP proves to be a good plan before farmers enrol	**Treats** - Possibility of adverse selection - Low enrolment rates - Inconsistency in milk supply by a majority of TDPL members - Low SES of majority of farmers in Nandi North District - Competitors in milk collection, which reduces TDPL membership - Membership to other health insurances

Figure 5.1 The SWOT matrix applied to the TCHP

(Van den Broek et al 2011:13)

The matrix gave a clear overview of the summarised factors that were identified based on the research results. These are not described in detail in this section as they are a summary of the already discussed results. The opportunities for the TCHP are found in time and information provision. Time, because the majority of the non-enrolled indicated that they would rather wait to see whether the TCHP proves to be a good plan before they enrol. If the TCHP proves to be beneficial, sustainable and trustworthy over time, it might lead to higher enrolment rates. If the TCHP met the target groups' request for more education, sensitisation and promotion, this might well lead to a higher enrolment.

The study results, literature referred to for enrichment of the discussions, internal reflection of the TCHP and the SWOT analysis matrix that was consequently developed provided valuable information on study results in relation to the objectives of the TCHP. Although the SWOT analysis showed that there were sufficient helpful factors to achieve the objectives of the TCHP, there were also harmful factors that could prevent the achievement of the specified TCHP key objective.

5.5 SCOPE AND LIMITATIONS OF THE STUDY

Limitations are restrictions or challenges in a study that may decrease the generalisability of the results (Burns & Grove 2009:41). The focus of this research was to describe those factors that came to bear upon enrolment in a CHI, in particular the TCHP in North Nandi District in Western Kenya. The study was limited to one geographical area, namely the area around the TDPL milk collection centre of Lemook. The farmers of the other three TDPL milk collection centres were therefore excluded, despite the possibility that they might have made a valuable contribution to the results.
The sample size of 135 respondents was inadequate a size for quantitative studies to ensure external validity and to generalise the results. Use of a convenience sample could have compromised objectivity and internal validity.

Out of the sample, 14% (n=17) were enrolled in the TCHP, which was representative for the enrolled percentage of the target population. However, the small number of 17 enrolled respondents disadvantaged the power of the study. Power is the capacity of a study to detect differences or relationships that actually exist in the population (Burns & Grove 2009:357).

Based on the literature review, the researcher tried to capture evidence-based influencing factors in the interview schedule. However, it was challenging to capture the identified factors, especially considering changes accompanying a shift in context. For this reason, the interview schedule was not exhaustive, but limited.

Use of research assistants to write up information on the interview schedule might have had room for discrepancy and accurate recording of the responses. Most of the interviews were conducted in Kiswahili. Although the interviewers internalised the translated version of the interview guide, translation and interpretation of the items might have influenced the responses to the research questions.

5.6 RECOMMENDATIONS

The following recommendations were made to support the management of the TCHP, in order to modify and improve current practices, policies and guidelines with regard to the enrolment of dairy farmers and in order to achieve better access to healthcare. Recommendations deductively referred to aspects such as marketing strategies, financial approach, public health and implications for further research.

Marketing strategies

Although the TCHP has made positive inroads into the community, due to community involvement and a thoughtful marketing strategy, there is still a lack of information and understanding on the benefit package of the TCHP and how it is managed. As the TCHP continues with the key marketing strategies that it currently uses, the following actions are recommended:

- ensure that information on the TCHP management is provided in several accessible ways
- update the promotional material with current information; the general information brochure, the brochure with Frequently Asked Questions and the brochure with Terms and Conditions (TCHP 2011a, b and c)
- make promotional material available in good quantity and in the local language
- conduct extra forums and include the treasure pot game to illustrate the CHI principle

- ensure that sales executives provide the target group with correct and complete information during visits

Financial approach

The majority of the target group are farmers with a low SES, for whom it is difficult to afford the TCHP. These recommendations seem viable:

- identify workable solutions for social inclusion of the poorest and those with low income
- identify cost effective ways in which farmers who are not able to supply milk consistently might be able to bridge the gap of the "dry" months in milk production

Several CHI schemes have worked with subsidies to include the poor as a tool to pursue the vision of universal coverage. However, these subsidies are associated with increased adverse selection. For this reason it is essential that targeted subsidies for the poor (or other high-risk groups) are accompanied with a sound plan to bridge the financial gap, so that the CHI scheme can continue to serve these populations (Parmar et al 2012:8). Overall, the increase of enrolment rates will assist in a more sustainable and financially sound CHI.

Public health aspect

Quality of care supplied by the contracted providers is crucial for the enrolment and renewal of enrolment of members of the community in the TCHP. Nandi North Health District and the resultant catchment area of the TDPL, is geographically extensive. The majority of the target population live a fair distance from a TCHP contracted health facility. Therefore, it is recommended that the TCHP should:

- regularly assess the quality of the contracted health centres of the TCHP in terms of client satisfaction, productivity and overall quality of the facilities
- assess the possibilities of adding other health centres to be contracted

- include the distance to the nearest contracted health facility as a criterion to determine premium levels (Sarpong et al 2010:195)

Implications for further research

This study was conducted in a specific geographical area among a specific target group by using the HIP framework. Recommendations for further research include conducting:

- a replicated study in the areas around the three other milk collection centres
- a similar, but adjusted study on the CHI for tea farmers of Koisagat, the second HIF programme in Kenya
- a similar, but adjusted study on other CHIs in Kenya, by using the HIP framework

In the broader body of knowledge:

- Further extensive research is required with larger populations, using the quantitative mode of enquiry to cover a broader area of farmers, in order to generalise the results.
- Nurses and doctors need to be on board to empirically investigate social determinants of health as they relate to health insurance.
- Dissemination of research results of this nature ought to be published widely to reach related researchers, clinicians and CHI consumers.

No implications were noted with regard to clinical nursing practice and education, as the respondents were satisfied with health services provided in the different health facilities.

It is assumed that increased enrolment in CHI provides better access to healthcare. However, the systematic literature review of different sources, particularly a study by Spaan et al (2012:698) mentioned that there is very little evidence on the impact of CHIs on quality of care and community empowerment on health issues. CHIs have large potential to explicitly involve the community in the organisation of health services. CHI definitely deserves greater scrutiny in order to determine how this promising mechanism can become a key to universal coverage.

5.7 CONCLUSION

This study sought to answer the research question: "What are the factors that influence enrolment of dairy farmers in a CHI for better access to healthcare?" The question was answered and the objectives of the study were reasonably achieved, presented and discussed us. A variety of factors that influence enrolment of dairy farmers in a CHI were identified and discussed.

The scope and limitation of the study were indicated. Based on the study results described, recommendations were outlined to be made to the management of the TCHP as well as to those involved in public health. Recommendations that were suggested were related to marketing strategies, financial approach, public health and implications for further research.

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Annexure A

Certificate of Ethical Clearance

Annexure B

Letter to request permission to conduct the study

Annexure C

Letter of permission to conduct the study

Annexure D

Informed consent form

Annexure E

Interview schedule in English and Kiswahili

Annexure F

Letter from the statistician

Annexure G

Data analysis report

Annexure H

Letter from the editor

UNISA university of south africa

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

HSHDC/32/2012

Date of meeting: 16 March 2012 Student No: 4340-203-8

Project Title: Factors influencing enrolment of dairy farmers to a community health insurance scheme for better access to health care.

Researcher: Tineke de Groot- de Greef

Degree: Masters in Public Health Code: DIS4986

Supervisor: Dr LV Monareng
Qualification: D Litt et Phil
Joint Supervisor: Prof HJ Roos

DECISION OF COMMITTEE

Approved [√] **Conditionally Approved** [ ]

Prof E Potgieter
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Dr MM Moleki
ACTING ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

T. de Groot
P.O. Box 1238
30100 Eldoret

Mr Ruto
Tanykina Dairy Plant Ltd.

Eldoret, August 3, 2012

Re: Application for permission to conduct a study on TCHP

Dear Mr Ruto,

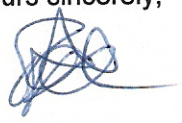
With this letter I would like to apply for permission to conduct a study among Tanykina members concerning the implemented Tanykina Community Healthcare Plan.

I am a Master's student at the Department of Health Studies of the University of South Africa (studentnr 43402038). I intend to conduct a study to describe factors influencing enrolment to the scheme. I hope this will assist in developing guidelines to improve the health insurance scheme of TCHP.

Around 135 respondents will be visited at their homestead to respond to an individual interview that will last approximately 45 minutes. There will be no risk or harm to any of the study respondents. Participation in the study will be voluntary and respondents will have the right to withdraw at any time during the process of data collection. In case of any psychological discomfort respondents are referred to the study counsellor Mrs W Rono (07-33397932)

The ethical approval for this study has been sought and obtained from the Department of Health Studies of UNISA. Attached please find the ethical clearance certificate and a copy of the research proposal. Thank you for your consideration.

Yours sincerely,



Tineke de Groot

TANYKINA DAIRY LIMITED.
T.D.L
improves your value

TANYKINA DAIRY PLANT LIMITED
P.O.BOX 4844 ELDORET
TELEPHONE NO: 0722665531/ 0723175989
Email: tanykina@gmail.com

Date 6th August 2012

To
Tineke de Groot
P.o Box 1238
Eldoret

Re: Application for permission to conduct a study on TCHP

This is to confirm to you that your request to conduct study among our members on the Tanykina Community Healthcare Plan has been accepted.

Please share with us your findings and recommendations that can help the company improve on the TCHP scheme.

Thank you

For and on behalf of Tanykina Dairy Plant LTD

Jeremiah Rutto
Plant Manger

TANYKINA DAIRY PLANT LTD.
MANAGER
06 AUG 2012
CELL: 0722 [illegible]
P. O. Box 4844 - 30100,ELDORET

INFORMED CONSENT FORM FOR STUDY RESPONDENTS

This informed consent form is for members of Tanykina Dairy Plant Ltd., who are invited to participate in a research, titled: **"factors influencing enrolment of dairy farms to a community health insurance for better access to health care".**

Name of researcher: Tineke de Groot, student at University of South Africa (UNISA), studentnr. 43402038

Name of organisation: Tanykina Community Healthcare Plan (TCHP)

Name of supervisors: Dr LV Monareng and Prof. J Roos, UNISA

Purpose of the research

TCHP has been offered to the members of Tanykina Dairy Plant Ltd. Some members decided to enrol in the health insurance, others not. The purpose of this research is to describe the factors that influence this enrolment.

Voluntary participation

You are invited to participate in an interview that will take about 30 minutes. Your participation in this research is entirely voluntary. It is your choice whether to participate or not.

Procedure

The interview will be conducted by the researcher or a research assistant. If you do not wish to answer any of the questions during the interview, you may say so and the interviewer will move on to the next question. No one else but the interviewer will be present unless you would like someone else to be there for you. The information recorded is confidential. Your name is not being included on the forms and only a number will be utilised to identify you.

Confidentiality

You are assured that any information you share will remain strictly confidential and will be used solely for the purpose of this study. Though the information will be published, it won't be shared with anybody on personal basis. All information collected from you will be kept in a secure place by the researcher. The data will be accessible only to the researcher and the supervisors.

Benefits

There will be no direct benefit to you, but your participation is likely to help find out how TCHP can be improved.

Who to contact

If you have any questions about this research study itself, please contact Tineke de Groot at 07-36482815. In case of any psychological discomfort by partaking in this study, you are referred to the study counsellor Mrs W Rono (07-33397932). This study has been approved by the Research and Ethics Committee of the Department of Health Studies at UNISA. Should you have any questions regarding this study and your rights as a study respondent or if you wish to report any problems you have experienced related to the study, please contact Dr LV Monareng, research supervisor of UNISA at monarlv@unisa.ac.za.

Certificate of consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a respondent in this study.

Name of respondent:

Signature of respondent:

I have explained this research study to the above study respondent and have sought his/her understanding for informed consent.

Signature of researcher/research assistant and date:

INTERVIEW SCHEDULE ON: FACTORS INFLUENCING ENROLMENT OF DAIRY FARMERS TO A COMMUNITY HEALTH INSURANCE SCHEME FOR BETTER ACCESS TO HEALTH CARE

Answer the questions by entering the number allocated to the choices provided in the key, into the blocks in the right hand margin. Ignore the coding of the blocks

For office use only **1-3** | | | | |

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISITICS

1. INDICATE GENDER Key: Female = 1
Male = 2

4 |

2. How old are you?

Key: 18-24 years = 1
25-34 years = 2
35-44 years = 3
45-54 years = 4
55-64 years = 5
65 years and above = 6

5 |

3. What is your marital status?

Key: Never married = 1
Married = 2
Divorced/ separated/widowed = 3

6 |

4. How many children do you have?

Key: 0-2 children = 1
3-4 children = 2
5-6 children = 3
7-8 children = 4
9 or more children = 5

7 |

5. What is the highest level of education you have completed at school?

Key: None = 1
Primary school = 2
Secondary school = 3
Post secondary education = 4

8 |

6. How many litres of milk per day do you averagely bring to the Tanykina Dairy Plant?

Key: 1-3 litres = 1
4-6 litres = 2
7-9 litres = 3
10-12 litres = 4
12 or more litres = 5 How many? .....

9 |

7. How many months of the past 12 months did you supply milk to the Tanykina Dairy Plant?

Key: 1-3 months = 1
4-6 months = 2
7-9 months = 3
10-12 months = 4

10 |

8. Do you have another income source besides selling of milk?

Key: Yes = 1
No = 2

11 |

9. Do you or another household member have another health insurance than TCHP?

Key: Yes = 1
No = 2

12 ☐

9.1 If yes, please specify other health insurance......

10. Are you enrolled to TCHP?

Key: Yes = 1, GO TO QUESTION 12
Yes, but did not pay for one month (suspended) = 2, GO TO QUESTION 11
Yes, but did not pay for more than 2 months (terminated) = 3, GO TO QUESTION 11
No = 4, SKIP QUESTION 11,12

13 ☐

11. If suspended or terminated, what is the reason?

Key: For financial reasons = 1
Not satisfied with the benefit package = 2
Other = 3

14 ☐

11.1 Please specify other reason.....

GO TO SECTION B

12. How many persons of your household are enrolled to TCHP?

Key: 1 person = 1
2-3 persons = 2
4-6 persons = 3
7 or more persons = 4

15 ☐

SECTION B: FACTORS RELATED TO (NON) ENROLMENT

13. Did a TCHP sales executive visit your household to give you information about TCHP?

Key: Yes = 1
No = 2

16 ☐

14. Indicate to what extent you agree with the following statements

Key: Strongly disagree = 1
Disagree = 2
Undecided = 3
Agree = 4
Strongly agree = 5

14.1 I know what TCHP is

17.1 ☐

14.2 I understand how TCHP works

17.2 ☐

14.3 I know what is included in the benefit package of TCHP

17.3 ☐

14.4 The benefit package of TCHP is satisfactory

17.4 ☐

14.5 TCHP is affordable

17.5 ☐

14.6 Paying premium via milk is an attractive payment method

17.6 ☐

14.7 TCHP is well promoted in the community

17.7 ☐

14.8 People talk positively about TCHP

17.8 ☐

14.9 I know how TCHP is set up and managed

17.9 ☐

14.10 I trust the TCHP management

17.10 ☐

15. How long do you have to travel to the nearest TCHP Health Centre? (Kaiboi, Kaigat, Chepkemel, Kabiemit, Chepterwai)

Key: Less than 30 min = 1
Between 30 min and one hour = 2
More than one hour = 3

18 ☐

16. Indicate to what extent you do agree with the following statements

Key: Strongly disagree = 1
Disagree = 2
Undecided = 3
Agree = 4
Strongly agree = 5

16.1 Health insurance helps people to prevent financial disaster

19.1 ☐

16.2 Health insurance is useful for my family

19.2 ☐

16.3 I don't mind contributing money to a health care plan and not benefit from it while others do

19.3 ☐

16.4 In the last 12 months my household had to pay a lot of money for health care and medication

19.4 ☐

16.5 I would rather wait and see whether TCHP is a good plan before I enrol

19.5 ☐

16.6 If I become really sick, the community will do a "harambee", so I don't need a health insurance

19.6 ☐

SECTION C: HEALTH SERVICES SATISFACTION

FOR TCHP ENROLLED

17. Did you make use of health services under TCHP?

Key: Yes = 1
No = 2

20 ☐

17.1 If not, specify why not.....

18. Which health care facility out of the following five facilities do you use most?

Key: Kaiboi Health Centre = 1
Kaigat Health Centre = 2
Chepkemel Health Centre = 3
Kabiemit Health Centre = 4
Chepterwai Health Centre = 5

21 ☐

IF NOT USED ANY OF THESE FACILITIES GO TO QUESTION 20

19. How do you perceive the services of the mentioned most visited Health Centre? Indicate to what extent you agree with statements about these services.

Key: Strongly disagree = 1
Disagree = 2
Undecided = 3
Agree = 4
Strongly agree = 5

19.1 Health services are available at any time of the day

22.1 ☐

THIS QUESTION IS ONLY FOR TCHP ENROLLED MEMBERS

19.2 Using the TCHP membership card is convenient

22.2 ☐

19.3 I do not wait long to see a doctor or nurse

22.3 ☐

19.4 The doctor or nurse attends to me professionally

22.4 ☐

19.5 The doctor or nurse attends to me in a friendly way

22.5 ☐

19.6 The doctor or nurse takes enough time to examine or treat me

22.6 ☐

19.7 The doctor or nurse explains to me well the disease and its treatment

22.7 ☐

19.8 I do not wait too long to get laboratory tests or results

22.8 ☐

19.9 I do not wait too long to get prescribed medicines

22.9 ☐

19.10 Prescribed medicines are always available

22.10 ☐

19.11 I am satisfied with the delivered services of the health centre

22.11 ☐

20. Do you have any comments you would like to make about TCHP?

.....

.....

.....

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MAHOJIANO JUU YA: SABABU ZINAZOCHANGIA USAJILI WA WAKULIMA WA MAZIWA KWA BIMA YA AFYA YA JAMII KWA HUDUMA BORA YA AFYA

Jibu maswali kwa kuweka nambari katika mabano katika mkono wa kulia

Kwa matumizi ya ofisi pekee **1-3** | | | | |

SEHEMU A: TABIA NA MITINDO YA KIJAMII

1.Jinsia

Mwanamke = 1
Mwanamume = 2

4 |

2. Je una miaka mingapi?

Kati ya miaka 18-24 = 1
25-34 = 2
35-44 = 3
45-54 = 4
55-64 = 5
65 au zaidi = 6

5 |

3. Je hali yako ya ndoa ni gani?

Hujaoa/hujaolewa = 1
Umeoa/umeolewa = 2
Talikiana/tengana/fiwa = 3

|

6

4. Je una watoto wangapi?

Kati ya watoto 0-2 = 1
3-4 = 2
5-6 = 3
7-8 = 4
9 au zaidi = 5

7 |

5. Ni kiwango kipi cha elimu ulichofikia?

Hakuna = 1
Shule ya msingi = 2
Shule ya upili = 3
Zaidi ya shule ya upili = 4

8 |

6. Ni lita ngapi ya maziwa kwa siku unayoleta katika kiwanda cha maziwa cha Tanykina?

Kati ya lita 1-3 = 1
4-6 = 2
7-9 = 3
10-12 = 4
12 au zaidi = 5

9 |

7. Ni miezi mingapi katika mwaka jana uliweza kupeleka maziwa katika kiwanda cha Tanykina?

Kati ya miezi 1-3 = 1
4-6 = 2
7-9 = 3
10-12 = 4

10 |

8. Je una mapato mengine kando na uuzaji wa maziwa?

Ndiyo = 1
La = 2

11 |

9. Je wewe au mmoja wa jamaa zako walio na bima ya afya kando na TCHP?

Ndiyo = 1
La = 2

12 ☐

9.1 Kama ndiyo, tafadhali fafanua bima hiyo……..

10. Je umesajiliwa katika TCHP?

Ndiyo	= 1 enda swali 12
Ndiyo, lakini sijalipa kwa mwezi moja	= 2 enda swali 11
Ndiyo, lakini sijalipa kwa miezi mbili au saidi	= 3 enda swali 11
La	= 4 ruka swali 11 na 12

13 ☐

11. Mbona haujasajiliwa kwa vyovyote katika TCHP?

Sababu ya kifedha	= 1
Kutoridhika na faida zake za kimapato	= 2
Sababu zingine	= 3

14 ☐

11.1 Tafadhali elezea sababu zingine……

12. Ni watu wangapi katika familia yako wamesajiliwa katika TCHP?

Mtu/watu	1	= 1
	2-3	= 2
	4-6	= 3
	7 au zaidi	= 4

15 ☐

SEHEMU B: SABABU ZA KUTOJIANDIKISHA

13. Je mkufunzi wa TCHP alitembelea nyumbani kwenyu kuwapa habari ama mafunzo juu ya TCHP?

Ndiyo = 1
La = 2

16 ☐

14. Elezea ni kwa kiwango gani unakubaliana na habari hizi

Sikubali kabisa =1
Sikubali =2
Niko kati kati =3
Nakubali =4
Nakubali kabisa =5

14.1 Ninajua TCHP ni nini

17.1 ☐

14.2 Naelewa jinsi TCHP inavyo fanya kazi

17.2 ☐

14.3 Naelewa faida zilizo jumuishwa katika TCHP

17.3 ☐

14.4 Faida za TCHP zinaridhisha

17.4 ☐

14.5 TCHP ni ya bei nafuu

17.5 ☐

14.6 Kulipa bima kupitia maziwa ni mpango mzuri ya malipo

17.6 ☐

14.7 Katika jamii, TCHP imesifika

17.7 ☐

14.8 Watu wanazungumzia vyema TCHP

17.8 ☐

14.9 Najua uanzilishi na usimamizi wa TCHP

17.9 ☐

14.10 Namini usimamizi wa TCHP

17.10 ☐

15. Je unasafiri umbali gani kwa hospitali cha TCHP? (Kaiboi, Kaigat, Chepkemel, Kabiemit, Chepterwai)

Chini ya dakika 30 = 1
Kati ya nusu saa na saa moja =2
Saidi ya saa moja =3

18 ☐

16. Elezea ni kwa kiwango gani unakubaliana na habari hizi

Sikubali kabisa =1
Sikubali =2
Niko kati kati =3
Nakubali =4
Nakubali kabisa =5

16.1 Bima ya afya inasaidia watu kuzuia janga la kifedha

19.1 ☐

16.2 Bima ya afya ni muhimu kwa jamii yangu

19.2 ☐

16.3 Sijali kuchangia fedha kwa mpango ya afya na nisifaidike licha ya wengine kufaidika

19.3 ☐

16.4 Kwa muda wa miezi 12 iliyopita, ilibidi watu wa jamii yangu kulipa pesa nyingi kwa huduma ya afya na matibabu.

19.4 ☐

16.5 Naona ni vyema kungoja na kuona mpango wa TCHP kama ni mzuri kabla sijajiandikisha

☐

19.5

16.6 Iwapo nitakuwa mgonjwa sana jamii watafanya mchango,hivo basi sitahitaji bima ya afya

19.6 ☐

SEHEMU C:KURIDHIKA KWA USAJILI

17. Je ulipata huduma chini ya mpango wa TCHP?

Ndiyo =1
La =2

20 ☐

17.1 Iwapo la eleza kwa nini ……

18. Ni vifaa vipi vya huduma ya matibabu chini ya TCHP Uliyotumia zaidi?

Hospitali ya Kaiboi =1
Hospitali ya Kaigat =2
Hospitali ya Chekemel =3
Hospitali ya Kabiemit =4
Hospitali ya Chepterwai =5

21 ☐

19. Je wazionaje huduma za vituo vya afya chini ya TCHP ulizozitembelea? Elezea ni kwa kiwango gani unachokubaliana na habari kuhusu hizi huduma.

Nakataa kabisa =1
Nakataa =2
Sijaamua =3
Nakubaliana =4
Nakubaliana kabisa =5

19.1 Huduma za afya zinapatikana wakati wowote

22.1 ☐

19.2 Kutumia kadi ya uwanachama wa TCHP ni mwafaka

22.2 ☐

19.3 Si subiri muda mrefu kumwona daktari au mwuuguzi

22.3 ☐

19.4 Daktari au mwuuguzi unihudumia jinsi inavyotakikana **22.4** ☐

19.5 Daktari au mwuuguzi unihudumia kirafiki **22.5** ☐

19.6 Daktari au mwuuguzi anachukua wakati mzuri kunichunguza na kunitibu **22.6** ☐

19.7 Daktari au mwuuguzi hunifahamisha vyema kuhusu ugonjwa na tiba yake **22.7** ☐

19.8 Si subiri muda mrefu kupata majibu kutoka chumba cha mahabara **22.8** ☐

19.9 Si subiri muda mrefu kabla ya kupata madawa niliyoandikiwa **22.9** ☐

19.10 Madawa yaliyoandikwa yanapatikana kila mara **22.10** ☐

19.11 Naridhika na huduma zinazotolewa na kituo cha afya **22.11** ☐

20. Je una habari yoyote ungelipenda kutoa kuhusu TCHP?

.....

.....

.....

Alfred Kipyegon Keter
P.O. Box 1268-30100
Eldoret, Kenya

Eldoret, October 4, 2012

To whom it may concern

Re: Confirmation of statistical services

Dear Sir/Madam,

With this letter I would like to confirm that I have been assisting Tineke de Groot (studentnr 43402038) on statistical issues in order to finalise her dissertation entitled: "Factors influencing enrolment of dairy farmers to a community health insurance scheme for better access to health care".

I have assisted Tineke in the review of the methodology, data entry and data analysis. I have also assisted her in the review of chapter 4 of her dissertation.

I hold a Bachelors degree in Mathematics and Statistics and a Masters degree in Biostatistics. I have over 6 years of statistical data analysis and consultancy experience. I have lectured mathematics and statistical courses in two public universities in Kenya. I have skills in the use of SPSS, SAS, STATA and R statistical packages.

I have gladly assisted her and expect it meets the expectations.

Yours sincerely,

Alfred K. Keter
Biostatistician
USAID- AMPATH Consortium

Annexure G: Data analysis report by Alfred Kipyegon Keter

Data analysis was performed by using STATA SE version 12.

Section A: Socio-demographic characteristics

Table 1: Socio-demographic characteristics

Characteristic	Key	Valid sample size	Enrolled (n; %)	Not enrolled (n; %)	Overall (n; %)
Gender	Female vs. Male	135	5 (29)	57(48)	62(46)
Age (years)	18-24	135	1(6)	2(2)	3(2)
	25-34		3(18)	25(21)	28(21)
	35-44		4(23)	40(34)	44(32)
	45-54		2(12)	22(19)	24(18)
	55-64		4(23)	16(13)	20(15)
	65+		3(18)	13(11)	16(12)
Marital status	Never married	135	3(18)	6(5)	9(7)
	Married		14(82)	104(88)	118(87)
	Divorced/Separated/Widowed		0	8(7)	8(6)
children	0-2	134	3(19)	21(18)	24(18)
	3-4		6(37)	41(35)	47(35)
	5-6		1(6)	33(28)	34(25)
	7-8		4(25)	12(10)	16(12)
	9+		2(13)	11(9)	13(10)
Education	None	135	8(47)	30(25)	38(28)
	Primary school		4(23)	40(35)	44(33)
	Secondary school		3(18)	36(30)	39(29)
	Post secondary		2(12)	12(10)	14(10)
Litres of milk averagely per day	1-3	135	0	12(10)	12(9)
	4-6		12(71)	50(42)	62(46)
	7-9		0	18(15)	18(13)
	10-12		4(24)	21(18)	25(19)
	12+		1(6)	17(15)	18(13)
Months in the past 12 months supplied milk to TDPL	1-3	135	1(6)	8(7)	9(6)
	4-6		4(24)	40(34)	44(33)
	7-9		6(35)	38(32)	44(33)
	10-12		6(35)	32(27)	38(28)
Another income source	Yes vs. No	135	15(88)	105(89)	120(89)
Another health insurance	Yes vs. No	135	5(29)	28(24)	33(24)
Other Health Insurance	Missing	33	1(20)	0	1(3)
	CIC		0	1(4)	1(3)
	NHIF		4(80)	27(96)	31(94)

Two farmers were terminated because of financial reasons.

Of the 17 members who were enrolled to TCHP:

- 4 (27%) had 2-3 persons,
- 8 (53%) had 4-6 persons,
- and 3 (20%) had 7 or more persons from their households who were enrolled to TCHP.
- The two who were terminated did not specify the number of enrolees.

Those who were supplying more than twelve litres per day had the distribution of their daily supply of milk as follows:

Table 2: Distribution of the litres of milk supplied by members supplying over 12 litres

N	missing	Mean	Std. dev	Min	Max	Range	Lower quartile	Median	Upper quartile
10	8	27.6	13.18	14.00	50.00	36.00	15.00	23.50	41.25

Section B: Factors related to (non) enrolment

Out of 132 respondents, 74 (56%) were visited by a sales executive, 15 (88%) enrolled and 59 (51%) not enrolled.

There were 45(34%), 59(45%) and 27(21%) respondents who indicated that they travel at most 30, between 30 and 60 and more than 60 minutes, respectively, to the nearest clinic. Four did not respond to this question. Table 4 shows the results stratified by the enrolment status.

Table 3: Time taken to the nearest healthcare facility

Travel time	Enrolled(n=17)	Not Enrolled(n=114)
<30 minutes	7(41.18)	38 (33.33)
30-60 minutes	5(29.41)	54(47.37)
>60 minutes	5(29.41)	22(19.3)

Table 4 shows the levels of agreement on the statements under section B

Table 4: Factors related to (non)enrolment (n, %)

Statement	Enrolled					Not enrolled				
	Strongly disagree	Dis-agree	Un-decided	Agree	Strongly agree	Strongly disagree	Dis-agree	Un-decided	Agree	Strongly agree
1. I know what TCHP is	0	0	0	9(53)	8(47)	6(5)	21(18)	7(6)	71(60)	13(11)
2. I understand how TCHP works	0	0	3(18)	6(35)	8(47)	7(6)	41(35)	7(6)	55(47)	8(8)
3. I know what is included in the benefit package of TCHP	0	1(6)	1(6)	10(59)	5(29)	9(8)	30(26)	21(18)	45(38)	12(10)
4. The benefit package of TCHP is satisfactory	0	0	2(12)	10(59)	5(29)	6(5)	23(27)	32(27)	49(42)	8(7)
5. TCHP is affordable	1(6)	2(12)	0	10(59)	4(24)	20(23)	27(23)	28(24)	31(26)	12(10)
6. Paying premium via milk is an attractive payment method	0	2(12)	1(6)	9(53)	5(29)	6(5)	7(6)	15(13)	80(68)	10(8)
7. TCHP is well promoted in the community	1(6)	1(6)	1(6)	11(65)	3(18)	2(2)	16(14)	21(18)	69(58)	10(8)
8. People talk positively about TCHP	0	1(6)	6(35)	9(53)	1(6)	0	8(7)	26(22)	69(58)	15(13)
9. I know how TCHP is set up and managed	1(6)	2(12)	1(6)	10(59)	3(18)	12(10)	32(27)	33(27)	29(25)	12(10)
10. I trust the TCHP management	1(6)	0	3(18)	7(41)	6(35)	7(6)	13(11)	41(35)	43(36)	14(12)
11. Health insurance helps people to prevent financial disaster	0	1(6)	1(6)	9(53)	6(35)	0	2(2)	4(3)	75(64)	37(32)
12. Health insurance is useful for my family	0	0	1(6)	9(53)	7(41)	0	1(1)	7(6)	57(49)	52(44)
13. I don’t mind contributing money to a health care plan and not benefit from it while others do	0	2(12)	0	12(71)	3(18)	1(1)	14(12)	14(12)	75(64)	13(11)
14. In the last 12 months my household had to pay a lot of money for health care and medication	2(12)	11(65)	0	4(24)	0	13(11)	46(39)	2(2)	37(31)	20(17)
15. I would rather wait and see whether TCHP is a good plan before I enrol	3(19)	10(63)	2(13)	1(6)	0	7(6)	23(20)	24(21)	52(44)	11(9)
16. If I become really sick, the community will do a "harambee", so I don't need a health insurance	6(35)	7(41)	2(12)	2(12)	0	38(33)	58(50)	8(7)	6(5)	6(5)

Section C: Health services satisfaction

There were 10 TCHP members who made use of health services under TCHP. Seven had not made use of the health services. Six of them indicated that they did not use the services because they had not fallen sick, one said that he was not sure of which hospital to attend.

Those who made use of TCHP health centres mostly visited Kaiboi, Kaigat and Kabiemit health facilities. These results are presented in Table 5.

Table 5: Health centres mostly attended by the farmers

Health Centre	Frequency (%)
Kaiboi	4(3)
Kaigat	43(23)
Kabiemit	15(11)
Not attending any health centre	73(54)
Total	**135(100)**

From Table 5, 55 (41%) people indicated their satisfaction on the used health facility, which is shown in Table 6.

Table 6: Health services satisfaction

Variable	Valid n	Strongly Disagree n(%)	Disagree n(%)	Undecided n(%)	Agree n(%)	Strongly Agree n(%)
1. Health services are available at any time of the day	55	0	2(3)	0	40(73)	13(24)
2. Using the TCHP membership card is convenient	14	1(7)	0	0	7(50)	6(43)
3. I do not wait long to see a doctor or nurse	55	1(2)	3(5.5)	3(5.5)	38(69)	10(18)
4. The doctor or nurse attends to me professionally	55	0	0	2(3)	35(64)	18(33)
5. The doctor or nurse attends to me in a friendly way	55	0	9(16)	1(2)	27(49)	18(33)
6. The doctor or nurse takes enough time to examine or treat me	55	0	1(2)	2(4)	35(64)	17(31)
7. The doctor or nurse explains to me well the disease and its treatment	55	1(2)	0	1(2)	37(67)	16(29)
8. I do not wait long to get laboratory tests or results	55	1(2)	4(7)	10(18)	30(55)	10(18)
9. I do not wait long to get prescribed medicines	55	0	2(4)	3(5)	38(69)	12(22)
10. Prescribed medicine are always available	55	1(2)	6(11)	1(2)	32(58)	15(27)
11. I am satisfied with the delivered services of the health centre	55	0	1(2)	1(2)	30(54)	23(42)

Table 7, 8 and 9 show the results per health facility

Table 7: Kaiboi

Variable	Valid n	Disagree n(%)	Undecided n(%)	Agree n(%)
1. Health services are available at any time of the day	4	0	0	4 (100)
2. Using the TCHP membership card is convenient	1	0	0	0
3. I do not wait long to see a doctor or nurse	4	0	0	4(100)
4. The doctor or nurse attends to me professionally	4	0	1(25)	3(75)
5. The doctor or nurse attends to me in a friendly way	4	0	0	4(100)
6. The doctor or nurse takes enough time to examine or treat me	4	0	0	4(100)
7. The doctor or nurse explains to me well the disease and its treatment	4	0	1(25)	3(75)
8. I do not wait long to get laboratory tests or results	4	0	1(25)	3(75)
9. I do not wait long to get prescribed medicines	4	0	0	4(100)
10. Prescribed medicine are always available	4	0	0	4(100)
11. I am satisfied with the delivered services of the health centre	4	0	0	4(100)

Table 8: Kaigat

Variable	Valid n	Disagree n(%)	Undecided n(%)	Agree n(%)
1. Health services are available at any time of the day	36	1(3)	0	35(97)
2. Using the TCHP membership card is convenient	8	1(12)	0	7(88)
3. I do not wait long to see a doctor or nurse	36	3(9)	3(8)	30(83)
4. The doctor or nurse attends to me professionally	36	0	1(3)	35(97)
5. The doctor or nurse attends to me in a friendly way	36	8(22)	1(3)	27(75)
6. The doctor or nurse takes enough time to examine or treat me	36	1(3)	2(6)	33(91)
7. The doctor or nurse explains to me well the disease and its treatment	36	1(3)	0	35(97)
8. I do not wait long to get laboratory tests or results	36	2(6)	6(17)	28(78)
9. I do not wait long to get prescribed medicines	36	2(6)	3(8)	31(86)
10. Prescribed medicine are always available	36	6(17)	1(3)	29(80)
11. I am satisfied with the delivered services of the health centre	36	1(3)	1(3)	34(94)

Table 9: Kabiemit

Variable	Valid n	Disagree n(%)	Undecided n(%)	Agree n(%)
1. Health services are available at any time of the day	15	1(7)	0	14(93)
2. Using the TCHP membership card is convenient	5	0	0	5(100)
3. I do not wait long to see a doctor or nurse	15	1(7)	0	14(893)
4. The doctor or nurse attends to me professionally	15	0	0	15(100)
5. The doctor or nurse attends to me in a friendly way	15	1(7)	0	14(93)
6. The doctor or nurse takes enough time to examine or treat me	15	0	0	15(100)
7. The doctor or nurse explains to me well the disease and its treatment	15	0	0	15(100)
8. I do not wait long to get laboratory tests or results	15	3(20)	3(20)	9(60)
9. I do not wait long to get prescribed medicines	15	0	0	15(100)
10. Prescribed medicine are always available	15	1(7)	0	14(93)
11. I am satisfied with the delivered services of the health centre	15	0	0	15(1003)

Table 10 gives an overview of the comments as given in response on open question 20

Table 10: Overview of the comments

	Comments	Frequency(Percent)
1	Affordable	1(0.75)
2	No ambulances	1(0.75)
3	Animals dry up	1(0.75)
4	Continue with good work	6(4.48)
5	Due to join	1(0.75)
6	Expensive	40(29.85)
7	Expensive and far	4(2.99)
8	Expensive, need education	1(0.75)
9	Far	5(3.73)
10	Good	7(5.22)
11	Good and convenient	3(2.24)
12	Good and helps many	1(0.75)
13	Good and helps when no money	2(1.49)
14	Good and planning to join	3(2.24)
15	Good at paying bills	1(0.75)
16	Good because it cuts down hospital bill	2(1.49)
17	Good but expensive	2(1.49)
18	Health centre far and poor services and no maternity and gynaecology	1(0.75)
19	Improve products to attract farmers	1(0.75)
20	Improve quality and delivery of service	1(0.75)
21	Inconvenient	2(1.49)
22	Need education	23(17.16)
23	Need free treatment	1(0.75)
24	Need promotion	3(2.24)
25	Need sensitization	11(8.21)
26	Need to add services in the health centres	1(0.75)
27	Need to wait and see how it works before joining	1(0.75)
28	Neglect by hospital	1(0.75)
29	Not efficient because it is localized	1(0.75)
30	Not seen sales executives	1(0.75)
31	Poor infrastructure during rainy season	1(0.75)
32	Review prices of milk	1(0.75)
33	Review prices of milk and try improve services	1(0.75)
34	Should be expanded to other farmers	1(0.75)
35	Should provide animal products and treatment and provide services at reduced cost	1(0.75)
	Total	134(100)

Factor analysis to reduce multidimensionality of the variables associated with enrolment

Table 11: Correlation matrix

Variable	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16
V1	1.0000															
V2	-0.3207	1.0000														
V3	-0.1320	-0.6341	1.0000													
V4	-0.3032	-0.0129	-0.2034	1.0000												
V5	-0.0734	0.0359	-0.0372	0.0242	1.0000											
V6	0.1985	-0.0347	-0.0243	-0.3521	-0.2293	1.0000										
V7	0.1238	-0.0792	0.0115	-0.1464	-0.0956	-0.1030	1.0000									
V8	-0.0185	-0.0940	0.0196	-0.0519	-0.1150	0.0232	-0.1652	1.0000								
V9	0.0230	-0.0139	-0.1490	-0.0573	0.0289	-0.0401	-0.2118	-0.0406	1.0000							
V10	-0.0736	-0.1533	0.0339	-0.1762	-0.2040	-0.1052	-0.0052	0.0195	-0.3513	1.0000						
V11	-0.0944	0.0300	0.0018	0.2152	0.2287	-0.1333	-0.1648	-0.2426	0.0544	-0.1408	1.0000					
V12	-0.1094	-0.1505	0.1259	-0.0431	-0.1307	0.0849	-0.0173	-0.1198	-0.1635	0.1730	-0.5053	1.0000				
V13	-0.1208	0.0913	0.0081	0.0680	0.2113	0.0295	-0.0962	-0.2813	0.1467	-0.2931	0.1101	-0.2964	1.0000			
V14	-0.0300	0.1063	-0.0587	-0.0512	-0.1262	0.0294	0.0186	0.0757	-0.0063	0.0939	-0.1015	-0.0884	-0.0297	1.0000		
V15	-0.1113	-0.0201	0.1478	0.1010	0.1534	-0.1407	0.0309	-0.0989	0.2000	-0.1443	0.1891	-0.0204	0.2054	-0.2092	1.0000	
V16	-0.0336	-0.2323	0.2706	0.1151	-0.0005	0.0315	-0.2506	-0.0247	-0.0921	0.1362	0.2384	0.2169	0.0953	-0.1144	0.0363	1.0000

The overall Keiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.813 (Table 14). This suggests that factor analysis was appropriate for use to reduce their multidimensionality. This is apparent from the table below. It is obvious from the table that the least KMO value from the individual variables was 0.60 suggesting that the requirements for inclusion in the factor analysis model were met for each individual variable too.

Table 12: Keiser-Meyer-Olkin (KMO) measure of sampling

Variable	KMO
V1	0.8588
V2	0.8306
V3	0.8442
V4	0.8842
V5	0.8046
V6	0.8562
V7	0.8794
V8	0.8407
V9	0.8934
V10	0.8572
V11	0.6088
V12	0.6013
V13	0.6074
V14	0.5978
V15	0.7457
V16	0.6143
V1	0.8125

Table 13: Factor analysis results with all the variables included

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.13862	3.33270	0.6548	0.6548
Factor2	1.80593	1.17337	0.2301	0.8849
Factor3	0.63255	0.19430	0.0806	0.9655
Factor4	0.43826	0.12227	0.0558	1.0214
Factor5	0.31599	0.03596	0.0403	1.0616
Factor6	0.28002	0.18850	0.0357	1.0973
Factor7	0.09153	0.01658	0.0117	1.1090
Factor8	0.07495	0.04298	0.0096	1.1185
Factor9	0.03196	0.05803	0.0041	1.1226
Factor10	-0.02607	0.01164	-0.0033	1.1193
Factor11	-0.03771	0.06789	-0.0048	1.1145
Factor12	-0.10560	0.03540	-0.0135	1.1010
Factor13	-0.14100	0.00236	-0.0180	1.0830
Factor14	-0.14336	0.04540	-0.0183	1.0648
Factor15	-0.18876	0.13080	-0.0241	1.0407
Factor16	-0.31956	.	-0.0407	1.0000

This model has only two factors with eigenvalues greater than one.

Table 14: Factor loadings of the unrotated matrix

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Uniqueness
V1	0.6501	-0.2005	-0.3773	0.0250	0.1407	0.0794	0.0630	-0.0141	0.0169	0.3636	0.6501
V2	0.8479	-0.1894	-0.2529	0.0938	0.1011	-0.0691	-0.0748	0.0435	-0.0464	0.1479	0.8479
V3	0.8626	-0.1594	-0.2730	-0.0382	-0.0149	-0.0994	-0.0276	-0.0145	-0.0213	0.1430	0.8626
V4	0.8148	-0.1976	-0.0073	-0.1473	-0.0188	0.0614	0.0424	-0.0707	0.1093	0.2524	0.8148
V5	0.4678	-0.2001	0.2479	-0.1473	0.0509	-0.0530	0.1205	-0.0752	-0.1067	0.6211	0.4678
V6	0.5960	-0.1029	0.3018	-0.2510	0.0080	0.0505	-0.0841	-0.0623	0.0162	0.4664	0.5960
V7	0.5928	0.0739	0.3176	0.2236	0.1242	-0.0343	-0.0333	-0.0288	0.0348	0.4725	0.5928
V8	0.4722	0.2237	0.0740	0.2104	0.1091	0.2249	-0.0570	-0.0688	-0.0420	0.6050	0.4722
V9	0.7364	0.0004	0.1769	0.0793	-0.0698	-0.1562	0.0283	0.1362	0.0319	0.3704	0.7364
V10	0.7426	0.0460	0.1558	-0.0824	-0.1342	0.1663	0.0160	0.1498	-0.0313	0.3460	0.7426
V11	0.2223	0.7249	-0.0066	-0.0382	0.1286	-0.0940	-0.1138	-0.0087	0.0019	0.3852	0.2223
V12	0.1576	0.7152	-0.0230	-0.0881	0.1244	-0.1422	0.0646	0.0183	0.0031	0.4151	0.1576
V13	0.2268	0.5066	-0.0585	0.1724	-0.068	0.2524	0.1179	-0.001	0.0089	0.5764	0.2268
V14	-0.1656	0.0301	0.0356	-0.1503	0.3261	-0.0238	0.1177	0.0406	0.0138	0.8253	-0.1656
V15	-0.3884	-0.2037	0.0064	-0.1937	0.2408	0.2227	-0.0832	0.0952	0.0023	0.6465	-0.3884
V16	-0.2074	-0.4701	0.1787	0.3385	0.1778	-0.0562	0.0247	0.0209	0.0143	0.5534	-0.2074

Table 15: Result of rotating the factor loadings

Factor	Variance	Difference	Proportion	Cumulative
Factor1	4.04040	2.24251	0.5148	0.5148
Factor2	1.79790	0.41633	0.2291	0.7439
Factor3	1.38156	0.90357	0.1760	0.9200
Factor4	0.47799	0.01061	0.0609	0.9809
Factor5	0.46738	0.06387	0.0596	1.0405
Factor6	0.40351	0.29673	0.0514	1.0919
Factor7	0.10679	0.01795	0.0136	1.1055
Factor8	0.08884	0.04340	0.0113	1.1168
Factor9	0.04544	.	0.0058	1.1226