

**PREDICTORS OF ENROLLMENT INTO COMMUNITY BASED HEALTH
INSURANCE SCHEMES AMONG PATIENTS WITH DIABETES
MELLITUS IN WAKISO DISTRICT – CENTRAL UGANDA**

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DECLARATION

I, Sarah Komugisha, hereby declare that this dissertation is my original work and has never been presented for the award of a degree in any institution.

Sarah Komugisha

Signature: _____ Date: _____

APPROVAL

This research project was conducted under my supervision and assistance and thereby ready for submission to the university.

Ms. Angela Namwanje Kawooya

Signature: _____ Date: _____

DEDICATION

This dissertation is dedicated to my dear husband **David Paul Alich** and sisters for the overwhelming support and sacrifice you have accorded to me during this period while undertaking the MPH program

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LIST OF ACRONYMS

BISP	Benazir Income Support Program
CDC	Centers for Disease Control
CHF	Community Health Financing
COVID19	Corona Virus Disease 19
DHS	Demographic Health Survey
FSD	Financial Sector Deepening
LMICs	Low and middle Income Countries
NDHS	Nigeria Demographic and Health Survey
NSO	National Statistical Office
OECD	Organization for Economic Corporation and Development
SHU	Save for Health Uganda
UHC	Universal Health Coverage
WHO	World Health Organization
WTJ	Willingness to Join

OPERATIONAL DEFINITIONS

Term	
Enrollment	This term refers to being an official member of any program or activity. In the current study, the term referred to being a member of the community based insurance scheme designed for persons diagnosed with diabetes. It entailed being currently able to access diabetes related healthcare without any need for out of pocket expenditure, following cover by the community based health insurance scheme for diabetics.
Predictors	This term referred to the characteristics that were found to have statistically significant relationships with community based health insurance enrollment. The predictors were three in number and they included intrapersonal, healthcare service and scheme related characteristics
Intrapersonal predictors	This term referred to the socio demographic and personal characteristics that were found to have statistically significant relationships with enrollment into the community based insurance scheme for diabetics
Healthcare service related predictors	This term referred to characteristics of healthcare provision at the available health facilities, that were found to have statistically significant relationships with enrollment into the community based insurance scheme for diabetics
Scheme related predictors	This term referred to the characteristics of the community based health insurance scheme including its operational policies, that were found to have statistically significant relationships with enrollment into the community based insurance scheme for diabetics

ABSTRACT

Background: This study was done to assess predictors of enrollment into community based health insurance schemes and patients with type II diabetes mellitus in Wakiso district – central Uganda. Diabetes is linked with 1.5 million deaths annually, with all deaths related to poorly controlled diabetes that arise, in part due to non-adherence to medication. Such non-adherence in most cases arises from financial limitations and so, diabetic patients need to have health insurance cover. Currently, CBHI schemes are the most common in developing countries and some have been customized for diabetes patients, as is the case in Wakiso district. However, enrollment into those schemes remains a challenge.

Method: The study was cross sectional, targeting 291 diabetic patients in Wakiso district, in which all the three facilities with the CBHI scheme were purposively sampled and patients randomly sampled, following which structured interviews were used to collect data. Data was analysed in SPSS 25 using the log-binomial model.

Results: The proportion of patients with diabetes mellitus in Wakiso district that is enrolled into community based health insurance schemes is 81.4% (237).

The prevalence of CBHI enrollment was higher among patients who were Catholics (aPR = 3.982 [CI = 1.190 - 13.318], P = 0.025), who had been educated to secondary school (aPR = 12.749 [CI = 3.716 - 43.735], P = 0.000), who rated their health status as being somehow okay had 16 times the odds of being enrolled (aPR = 16.526 [CI = 5.001 - 54.611], P = 0.000). It was however less among patients who had lived with diabetes for less than 5 years (aPR = 0.269 [CI = 0.127 - 0.568], P = 0.001), although it was higher among patients who reported that diabetes medication was always available at their respective health facilities (aPR = 1.979 [CI = 1.066 - 3.671], P = 0.030). No bivariate analysis could be conducted because of the null integers in the cells of all cross tabulations between the independent variables and the dependent variable. The null integers notwithstanding, it is evident that there could have been significantly higher proportions of enrolled patients who agreed to the institutional assertions than, those who disagreed.

Conclusion: Enrollment into the CBHI among diabetic patients in Wakiso district is high, but not universal, contrary to ideal standards. It is mainly predicted by intrapersonal characteristics and to some extent by institutional characteristics, although it was possible that scheme characteristics are also been of conceivable importance. Behavior change communication will go a long way in increasing enrollment among the patients

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.0 Introduction

This study was done to assess predictors of enrollment into community based health insurance schemes and patients with type II diabetes mellitus in Wakiso district – central Uganda.

Globally, Diabetes mellitus is one of the most fatal Non-Communicable Diseases (NCDs) of this; up to 422 million people live with diabetes currently (WHO, 2022a). The disease is responsible for more than 1.5 million deaths annually (WHO, 2022b), in part due to the severe sequelae associated with it (Tsuji et al., 2020; Mouri, 2020; WHO, 2020a). Its mortality risk has been heightened many fold since the advent of the COVID19 pandemic, diabetes being one of the risk factors for infection (Freed, 2020) and mortality from it (Chai et al., 2022; Li et al., 2022; Bramante et al., 2021; Pelle et al., 2022). The severity of all the diabetes sequelae solely depends on blood sugar level control among the patients (Goyal, 2020), with those having controlled blood glucose suffering little to no complications (Lucier, 2020). Blood sugar level control nonetheless almost solely depends adherence to diabetes pharmacological treatment (Sendekie et al., 2022; Tsuji et al., 2020), yet it is costly (Alowayesh et al., 2022; American Diabetes Association, 2020). That makes diabetes one of the most costly to treat diseases in the world, with the direct health care costs significantly increasing (Freed, 2020).

Of concern, diabetes currently affects even the socio economically disadvantaged (WHO, 2022b; Mukherjee et al., 2020; Bavuma et al., 2020). It so happens therefore that whereas there is a current push to have universal health coverage achieved globally (Oraro-Lawrence et al., 2020; World Bank, 2020), in the main part, through the implementation of health insurance schemes targeting the most at risk persons for catastrophic health expenditure (Save for Health Uganda (SHU), 2020a), diabetic patients may be among the persons with the highest need for insurance cover. However, enrollment into those tailored programs remains a challenge among diabetes patients even with subsidized premiums.

1.1 Background of the study

Universal health coverage remains a cornerstone for the achievement of sustainable development goal 3 in its entirety (World Bank, 2020; Armocida, 2020; Tangcharoensathien et al., 2020; Oraro-Lawrence and Wyss, 2020), given that all targets ultimately rest on access to health care services. One of the most notable ways through which universal health coverage is being globally fostered by the implementation of community based health insurance schemes meant to offset direct health care costs (WHO, 2020) among the rural poor. That is in addition to those who have illnesses that are associated with high direct health care costs, and yet they are socio economically disadvantaged. Community based health insurance models are premised on the voluntary collection of funds by community members for purposes of off-setting direct health care costs (WHO 2020c). With such a model of operation, community based health insurance schemes remain as one of the most potent grantors of UHC, particularly in this time and age where national health insurance schemes are existent in only a few countries.

However, whereas health insurance schemes are meant to target all persons there are particular groups of people that perhaps need them most; one of those are diabetic persons. That follows immense evidence to the effect that persistent hyperglycemia due to none or sub optimal adherence to diabetes medication is the leading cause of severe morbidity and mortality among diabetics (Schubert et al., 2020; Alzaid et al., 2020; Goyal, 2020; Lucier, 2020; Tsuji et al., 2020), with the two phenomena (non-adherence), being inextricably linked with the high costs of medication (Emery et al., 2020; American Diabetes Association, 2020; Erzse et al., 2019). Diabetes treatment costs are some of the highest in the world (Alzaid et al., 2020) for a single disease, costing up to 845.0 billion USD (International Diabetes Federation, 2019). Outpatient costs range from \$5 to over \$40 with annual inpatient costs being up to \$1000 (Moucheraud et al., 2019). Such costs hinder blood sugar control, and predispose diabetes patients to severe morbidity and a heighten mortality risk (Alzaid et al., 2020; Mukherjee et al., 2020; Ling et al., 2020). The mortality risk arises from sequelae including retinopathies, kidney failure, cardiovascular dysfunction (Cosentino et al., 2020; WHO, 2020; Shrestha et al., 2020L Li, 2020; Tsuji et al., 2020; Zatońska et al., 2020; Adnan et al., 2020; Schubert et al., 2020), Cerebrovascular (Mouri, 2020), diabetic ketoacidosis, and hyperglycaemic diabetic coma

(Goyal, 2020) all of which shorten life expectancy (Schubert et al., 2020; Goyal, 2020; Lucier, 2020; WHO, 2020a).

In addition, uncontrolled blood sugar levels among diabetics have significant links with maternal child and reproductive health (International Diabetes Federation, 2020; Denney et al., 2018). Poorly managed diabetes during pregnancy is a known risk factor for pregnancy induced hypertension (Machado et al., 2020), premature rupture of membranes (Zhuang et al., 2020) and antepartum hemorrhage (Muche et al., 2020; CDC, 2019). The effects persist to the intrapartum period where the risk of adverse child birth complications increase and hence the risk of cesarean delivery (Ali et al., 2020; Bawah et al., 2019). Children born to mothers with poorly managed diabetes are more likely to be born preterm (Stogianni et al., 2019) and be admitted into intensive care units (Eshetu et al., 2019). The effects of poor managed diabetes on reproductive health are enormous. Poorly managed diabetes has been known to be one of the leading causes of infertility (Zauner et al., 2020; Chronicle, 2020; Martins et al., 2019) in males and females (Corona et al., 2020; Fachetti, 2020).

Persistent hyperglycemia among males causes erectile dysfunction (Corona et al., 2020; Bahar et al., 2020), affects ejaculatory volume and sperm cell function (Ibrahim et al., 2019). Among females it causes menstrual cycle disorders (Crețu et al., 2020) sexual dysfunction (Barnard et al., 2019; Asefa et al., 2019; Fachetti et al., 2020), and PCOS (Al-Thuwaini et al., 2020; Kazemi et al., 2019; Rodgers et al., 2019; Forslund et al., 2020). It thus follows therefore that blood glucose control (Lingaraj et al., 2020; Banerjee et al., 2020; Stegbauer et al., 2020) remains as the only route for preventing diabetes related morbidity and mortality. But, as earlier mentioned, blood glucose control among diabetic patients is largely dependent on consistent access to diabetes treatment, which is costly and even more costly with the management of sequelae (Zho et al., 2020; Moucheraud et al., 2019). That buttresses the importance of having all diabetic patients enrolled in health insurance schemes; most importantly community based ones, particularly given the increasing prevalence of the disease (Alzaid et al., 2020; WHO, 2020b; CDC, 2020a; WHO, 2020a; Lin et al., 2020).

It has actually been reported that diabetic patients with insurance have 40% more physician office visits and receive all medications prescribed compared to the uninsured (American Diabetes Association, 2020). That is in part why community based health insurance has been found to be very effective in averting mortality due to low health care access that accrues from high direct health care costs (Docrat et al., 2020; Demissie et al., 2020; Haven et al., 2018), and catastrophic health expenditure (Sun et al., 2020; Ijeoma, 2019; Mekonen et al., 2018). Despite the benefits however, Community based health insurance schemes world over are still faced with the challenge of enrollment. In West Africa, enrollment rates range from 5% to 20% (Yusuf et al., 2019; Salari et al., 2019; Ridde et al., 2018) and in East Africa, it ranges from 0.1% to 20% (Ndomba et al., 2019; Renggli et al., 2019). In Wakiso district, there exists a scheme designed for diabetic patients. However, despite having been in existence for more than a decade, it is reported that its enrollment levels are not optimal enough.

1.2 Statement of the problem

For the time that the diabetic patient CBHI schemes have been in existence at select facilities in Wakiso district, they have registered dismal enrollments of diabetes patients. In 2017, the scheme at Wakiso HC IV had 278 active diabetes patients subscribed, which was an increment of only 5% compared to the previous year (2016). As of 2020, the number was only 350 out of 648 patients registered in the diabetic clinic which was an increment of only 4.2% (Facility diabetic Association records, 2020, Unpublished). The same was true at Kajjansi health center IV; CBHI enrollees were only 212 out of 504 patients registered (Facility diabetic Association records, 2020, Unpublished). At Bulondo health center III the number of enrollees was a paltry 13 out of the 52 patients (Facility diabetic Association records, 2020, Unpublished).

There were evident gaps in enrollment among those patients, majority of whom would otherwise be enrolled given that they are provided with sensitization and health education about the CBHI. That is despite of the fact that protocol at Kajjansi health center IV, Wakiso health center IV and Bulondo health center III, where the CBHIs are, is that each newly diagnosed diabetes patient is oriented about the scheme and requested to enroll when they can. What was perhaps more of a concern was that despite such schemes having been in existence for almost 10 years, there had never been a study of why diabetic patients are not universally enrolled in them. There have been

studies conducted in Uganda to assess CBHI enrollment (Basaza et al., 2019; Nshakira-Rukundo et al., 2019; Haven et al., 2018; Derriennic, 2005; Basaza, 2010; Basaza, 2007). Despite the many studies on CBHI enrollment, there had been virtually none done that centered on enrollment among patients with diabetes. Therefore, there was a research gap in the context of what the predictors of enrollment in community based health insurance were among diabetic patients who received treatment from the three facilities with the scheme.

1.3 Objectives of the study

1.3.1 General objective

To assess predictors of enrollment into community based health insurance schemes and patients with type II diabetes mellitus in Wakiso district – central Uganda

1.3.2 Specific objectives

1. To determine the proportion of patients with diabetes mellitus in Wakiso district that were enrolled into community based health insurance schemes
2. To assess the intrapersonal predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda
3. To determine the health care service predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda
4. To establish the insurance scheme related predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda

1.4 Research questions

1. What was the proportion of type II diabetes mellitus patients in Wakiso district that was enrolled into community based health insurance schemes?
2. What were the intrapersonal predictors of enrollment into community based health insurance schemes among patients with type II diabetes mellitus in Wakiso district – central Uganda?

3. What were the health care service predictors of enrollment into community based health insurance schemes among patients with type II diabetes mellitus in Wakiso district – central Uganda?
4. What were the insurance scheme related predictors of enrollment into community based health insurance schemes among patients with type II diabetes mellitus in Wakiso district – central Uganda?

1.5 Significance of the study

The administrations of the respective CBHIs at Kajansi health center IV, Bulondo health center III and Wakiso health center IV will certainly be a beneficiary of the findings of the study given that until now, what they have known to be the predictors of enrollment of into the CBHI are largely anecdotal. With the findings, it is expected that the administrators of the scheme will be evidently informed about what predicts enrollment of the many diabetic patients, at patient, health care service and scheme levels. The administrators may thus be able to make necessary policy adjustments tailored to averting any attributes that may be found not to be protective of enrollment.

The study may be of significance to diabetic patients within Wakiso district and perhaps those beyond the district as well. That will be to the effect that when disseminated, the patients will not only get to know the imperativeness of being medically insured as diabetic patients but also what their enrollments are and what determines that enrollment at the level of the patient. The prevalence of enrollment into CBHI, now that was found to be fairly high, may independently trigger behavior change among non-enrolled diabetic patients in Wakiso district. The non-enrolled will also get to know which of their intrapersonal characteristics is not protective of enrollment, which may empower them to perhaps make personal initiatives to make necessary personal modifications.

Since part of the findings will highlight the healthcare service related predictors of enrollment into the community health insurance scheme for diabetics, this study will also be of significance to health care providers and leaders in Wakiso district. Those persons will also be informed about which of the institutional characteristics are protective of diabetics' enrollment into the

CBHI and those which are not, so that appropriate interventions can be devised to augment the former and minimize the latter.

The fact that this study may arguably be among the very few that have been conducted to assess the enrollment of diabetic patients into community based insurance schemes tailored for their own benefit, the study will certainly be a trigger within the health community, to conduct more such similar studies among other diabetic populations with access to tailored CBHIs. In addition, since there is currently little in-country literature related to the predictors of enrollment of diabetic patients into CBHIs, the study will also be a valuable source of literature for studies that will be conducted along similar lines.

1.6 Conceptual framework

This study was delimited to assessing enrollment into the Community Based Insurance Scheme, which was the dependent variable and conceptualized as a binary variable with two indicators. They were; “enrolled” and “not enrolled”, with the former referring to diabetic patients who were found to be active members (having valid scheme identification) of the CBHI for diabetics, at Kajansi health center IV, Wakiso health center IV and Bulondo health center III. Being an active member was established by both self-reports (reporting being able to obtain the whole range of diabetes related healthcare from Kajansi health center IV and Wakiso health center IV without out of pocket expenditure), and membership card verification. Given that enrollment into any community based health insurance scheme is a health related behavior, the triadic theory of influence by flay (2009) was used to inform this study. According to that theory, health behavior is influenced by a triad of factors operating at a proximal level (individual level), at a distal level (institutional / healthcare service level) and at an ultimate level (policy level or programmatic level).

Therefore, this study had three independent variables, one being the intrapersonal predictors of enrollment into the community based health insurance scheme, the second being the healthcare service predictors of enrollment into the community based health insurance scheme and the third being the insurance scheme predictors of enrollment into the CBHI. The choice of the three independent variables was also informed by numerous related studies (Nshakira-Rukundo et al., 2019; Panda et al., 2014; Atnafu et al., 2018; Gobena et al., 2018; Ozawa et al., 2016; Antwi et

al., 2014; Parmar et al., 2014; Reshmi et al., 2018; Alatinga and Williams, 2015; Adhikari et al., 2019; Ghimire et al., 2019; Aregbeshola & Khan 2018; Taddesse et al., 2020; Nageso et al., 2020)

Independent variables

Intrapersonal characteristics

- Age
- Gender
- Awareness about CBHI
- Perceived health status
- Education level
- Religion
- Duration since diagnosis with diabetes
- Diabetes type
- Prognostic characteristics
- Type of medication taken
- Marital status

Health care service related characteristics

- Distance to facility
- Travel time to health care facility
- Availability of diabetes medication
- Waiting time at facility
- Favoritism of insured patients
- Service level

Scheme related characteristics

- Amount of premium
- Benefits package composition
- Sensitization
- Integration of CBHI within government structures
- Packages covered in insurance scheme
- Nature of administration
- Exemption policies
- Waiting time at insurance office
- Trust in scheme

Enrollment into diabetic patient CBHI

- Enrolled (Currently active member of the facility CBHI for diabetics)
- Not enrolled (Not currently an active member of facility based CBHI)

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter includes a review of literature informed by findings that have been obtained in previous conducted related studies between the years 2014 and 2021. The chapter is organized in four sections, each of which contains literature related to one of the four study objectives. The first section (2.1) includes literature related to enrollment into health insurance schemes; the second (2.2) includes literature related to the intrapersonal predictors of enrollment into community based health insurance schemes, the third (2.3) includes literature related to the healthcare service predictors of enrollment into the insurance scheme while the fourth section of the chapter (2.4) includes literature related to the insurance scheme related predictors of enrollment into insurance schemes. Databases including PubMed, EMBASE, Science direct, SAGE and springer link were searched for peer reviewed articles that were reviewed.

2.1 The proportion of patients with diabetes mellitus enrolled into community based health insurance schemes

Before the advent of COVID19, the global challenge of rising socio economic inequity had been recognized as being apparent (OECD, 2021), along with increasing costs of healthcare and inability of most people to afford it. That has especially been true for developing countries, where the socio economic inequity has increased even more following the advent of COVID19 (Ferreira, 2021; OECD, 2021; World Economic Forum, 2021). Therefore, one of the ways through which gaps in healthcare access due to economic inequity are being closed is through the implementation of health insurance schemes. Since many countries in Africa have not implemented national health insurance schemes, easily locally implementable community based health insurance schemes have been much embraced. Such schemes involve local organization of people who then collectively aggregate funds in form of small premiums, to cater for majorly primary healthcare costs. Participation and/or enrollment into the schemes are usually voluntary and the amount of premiums paid depends on participant's healthcare needs (WHO, 2020). Given the possibility of making tailor made CBHI schemes, there have been health insurance schemes devised for diabetic patients only, to enable them access healthcare without the fear or

burden of out of pocket expenditure (WHO, 2020). Whereas such schemes are still few, nonetheless, Wakiso district in Uganda has already has them set up. The aching challenge to the scheme like all other general schemes is low enrollment (WHO, 2020).

In India, a systematic review by Reshmi et al. (2021) reported that health insurance uptake was low. A 2019 national survey in India reported a level of uptake of 14% among rural residents and an uptake of 18% among urban residents (National Statistical Office, 2019). In Indonesia, Muttaqien et al. (2021) national surveys that were conducted in 2016 reported that only 25% of the persons in the informal sector were willing to pay for insurance, which is symbolic of low enrollment in general.

In Pakistan, Habib and Zaidi (2021) whose study was cross sectional and including 167 female beneficiaries of a program referred to as the Benazir Income Support Programme (BISP), among whom it was reported that more than 80% were willing to enroll into the health care insurance scheme. Although the study did not explicitly focus on enrollment into the scheme, the high levels of willingness to pay for the scheme is indicative of the fact that enrollment into the programs may also have been high thereafter. That finding is comparable to findings by Shewamene et al. (2018) which was conducted in Jeddah Saudi Arabia in which willingness to pay was reported to be 69.6%. On the whole, studies in that have been conducted in Low and middle Income Countries (LMICs) have reported low enrollments in CBHIs (van Hees et al., 2019; Kanmiki et al., 2019; Abiola et al., 2019). It should be noted that in none of the aforementioned studies were diabetic patients sampled, implying that the level of enrollment of such patients is little known in Asia and the Middle East.

In West Africa, enrollment rates into CBHI have been reported to range from 4.5% to 45%, with the majority of the enrollment rates being in the region of 4% to 10%. In a study by Yusuf et al (2019) that was conducted in Nigeria only 4.5% of the respondents were found to have been apparently enrolled in the CBHI. An earlier study by Aregbeshola et al. (2018) however reported a lower prevalence of CBHI enrollment; they reported coverage of 2.1%, following use of secondary data from the 2013 Nigeria Demographic and Health Survey (NDHS). The coverage was however biased on only women. However, Ogundeji et al. (2019) found the level of willingness to pay and hence possibly enrollment, to be 82%, which is similar to findings by

Akwaowo et al. (2018) which was conducted among Rural Residents in Akwa Ibom State, Nigeria.

In Ghana, Demographic Health Survey (DHS) data showed that 35.5% of the women and men in 2014 had a valid insurance card and were able to show it to the enumerator (Paola et al., 2019), a rate which is higher than that which was recorded in Nigeria. A slightly higher level of enrollment was reported in Senegal, where an ambitious overall target of covering 75% of the total population with the three schemes including CBHI by 2017 had been earlier set was not achieved (Ridde et al., 2018). The coverage by that year was reported to have been 47%, with the majority of the members being inactive however. Like in Asian and Middle Eastern countries, there have been no studies conducted to assess enrollment in health insurance schemes among diabetic patients in West Africa.

In Ethiopia, CBHI enrollment has been reported to be significantly varied region to region (Kado et al., 2020). In 2015, the enrollment at national level was around 48%, and particularly ranging from 36% to 61% (Ethiopian Health Insurance Agency, 2015). Region specific studies have however reported lower enrollment rates; Nageso et al. (2020) found that only 12.8% of households in the Southern part of the country had been enrolled into a community based health insurance scheme, which is lower than what was reported in a later study by Abdilwohab et al. (2021), who found the level of enrollment to be 33.30%. In close agreement, Tadesse et al (2020) whose study based on the 2007 national census conducted by the Central Statistical Agency of Ethiopia (CSA) reported that only 35% of the households had been enrolled to CBHI. Nonetheless, another study by Nageso et al. (2020) on the other hand, which collected primary data, covering 632 households reported an enrollment rate of 12.8%.

Like West Africa, East Africa has also registered low enrollments of households in the community based health insurance schemes, with ranges of 0.1% to 20%. Kenya is one of the East African countries that have considered nationally rolling out health insurance schemes in a bid to achieve universal health coverage (Masengel et al., 2017) and reduce out-of-pocket. However, it has been reported that penetration of health insurance in Kenya is between 11% and 20% in some counties (Masengel et al., 2017). A study by Wasike (2017) which was conducted

among slum dwellers in Kibera, Nairobi County reported that the proportion of respondents who had taken up health insurance in the informal settlement were 27.1%.

In Tanzania, it has been reported that the Community Health Financing (CHF) scheme has not achieved its intended objectives (Ndomba et al., 2019). Enrolment rates in the country are still low and there is also high dropout of members from CHF (Renggli et al., 2019; Joseph, 2017; Maluka, 2014). The national CHF enrolment rate in 2015 was reported to be around 4.5% (Ministry of Health, Community Development, Gender, Elderly and Children, 2016); which was below the national target of 30% enrolment for that year (United Republic of Tanzania, 2016)

In the Ugandan context, a study by the financial Sector Deepening (FSD) (2018) reported that only 0.1% of all adults are insured in community-based medical schemes, which is arguably the lowest coverage of CBHI in Africa.

2.2 The intrapersonal predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus

In many studies (Mirach et al., 2019; Kanmiki et al., 2019; Seddoh and Sataru, 2018; Dartanto et al., 2020; Nshakira-Rukundo et al., 2019; Adu, 2019; Boateng et al., 2017; Panda et al., 2016a; Mebratie et al., 2015) age has been found to be a significant predictor of enrollment into CBHI. In some of them (Dartanto et al., 2020; Nshakira-Rukundo et al., 2019; Adu, 2019; Boateng et al., 2017; Panda et al., 2016a; Mebratie et al., 2015), older age was reported to be protective of enrollment in CBHI. However, there has been a substantial number of other studies that have also reported that it is younger persons that are more likely to be enrolled in a CBHI compared to their older counterparts (Savitha et al., 2017; Atnafu, 2018; Herberholz et al., 2016; Duku et al., 2016; Panda et al., 2016a; Mladovsky, 2014). In fact, Kagaigai et al. (2021) reported that there were decreasing odds of enrollment into health insurance with increasing age.

It has been found in almost all studies that with high awareness about health insurance schemes increases chance of enrolment (Fite et al., 2021; Basaza et al., 2019; Mirach et al., 2019; Ghaddar et al., 2018; Michael et al., 2019; Ogundeji et al, 2019; Macha et al., 2014). Kado et al. (2020) found that people who had good knowledge about CBHI were twice as likely to be enrolled into the CBHI, while Abdilwohab et al. (2021) found the chances to be 13 times higher among those who had good knowledge and Fite et al (2021) the odds to be 4 times higher.

Similarly, Demissie and Atnafu (2021), Shewamene et al. (2021), Surendar et al. (2019), and Ayanore et al. (2019) found low level of awareness about community-based health insurance to be a barrier to enrollment. Mirach et al. (2019) and Dror (2016) observed that good CBHI awareness increased insurance uptake by up to 3.77 times, while Nshakira-Rukundo (2019) reported that having knowledge about health insurance premiums increased enrollment odds by 17 times. Nageso et al. (2020) similarly, reported that CBHI enrollment was less among participants who were unaware about it.

There have been conflicting findings as regards what the effect of religion on health insurance enrollment is. Whereas some studies have reported that being a Muslim increases the chances of being enrolled, some have reported otherwise. Dixon et al. (2014) reported that females who belonged to Muslim and Traditional religion were more likely to have enrolled compared to their Christian counterparts. However, Badu et al. (2018) reported that Muslims were less likely to have their health insurance active as compared with Christians. Surprisingly, Reshmi et al. (2018) reported that the likelihood of Muslims, Christians, and Jains to have active health insurance.

The effect of education on CBHI uptake has been widely tested, with the majority of studies reporting a positive relationship between the two (Atnafu et al., 2018; Badu et al., 2018; Alatinga, 2015; Kimani et al., 2014; Manortey, 2014a). It is previously reported that individuals educated at higher level, preferably tertiary, have higher odds of enrolling and renewing their NHIS policy. Manortey (2014a) reported an increase in the odds of enrolling and renewing NHIS among households educated at tertiary level varies, ranging from about 2.1 to 5.9 times more higher than those with lower or no education.

Similar findings were reported by Paola et al. (2019) who reported that women and men with secondary education had 35% higher chances of being insured and Nageso et al. (2020) who reported that having secondary & above were almost 3 times more likely to be enrolled than those who were illiterates. Consistently, Nageso et al. (2020), Al-Hanawi et al. (2018), and Wasike (2017) reported that having secondary school education & above increased the chances of being insured, while Badu et al. (2018) and Maina (2016) found the effect to be higher among

those who had received tertiary education. Similarly, Manortey (2014a) reported an increase in the odds of enrolling and renewing NHIS among persona educated at tertiary level varies, ranging from about 2.1 to 5.9 times higher than those with lower or no education. Similar findings were reported by Paola et al. (2019) who reported that women and men with secondary education had 35% higher chances of being insured and Nageso et al. (2020) who reported that having secondary & above were almost 3 times more likely to be enrolled than those who were illiterates. Consistently, Wasike (2017) reported that having secondary school education & above increased the chances of being insured. A study by Maina (2016) also found that possessing tertiary education was positively related to uptake, similar to findings Badu et al. (2018), in which having tertiary level education was associated with 2.44 times higher chances of being insured

Some studies have however reported inconsistent findings; Kado et al. (2020) found that having primary education increased the odds of enrollment into the CBHI by 5 times, similar to findings by Ogundeji et al. (2019) who also found a negative association between education and insurance uptake. Nonetheless, Dixon (2014) reported that males with primary or no education were more likely to have never enrolled, and Garedeew et al. (2020) and Dixon (2014) found low education to be a barrier to enrollment into CBHI.

Enrollment into insurance has been found to vary by marital status (Atnafu et al., 2018; Taddesse et al., 2020; Paola et al., 2019; Badu et al., 2018; Masengel et al., 2017; Masengeli et al., 2017; Maina, 2016). Studies by Taddesse et al (2020), Paola et al. (2019) and Masengel et al (2017) reported that health insurance coverage was more prevalent among married patients. Similarly, married individuals in Ghana stood higher odds of enrolling and renewing their NHIS policy, according to findings by Amu (2016). Badu et al. (2018) also reported that respondents who were married consistently had 48 times higher odds having an active health insurance status. Additionally Maina (2016) identified higher uptake of health insurance among married women in Kenya, Ghana and South Africa. Another Kenyan study by Masengeli et al (2017) also found that married patients were found to be 10 times more likely to own a health insurance cover as compared to patients who were never married.

Perceived and actual health status have also been found to be of importance in predicting enrollment into CBHI. A perception of poor health was found to increase the odds of enrollment by nearly 6 times in a study by Fite et al. (2021). Although the study by Abdilwohab et al. (2021) considered an entire household as a study unit, it determined that with increasing frequency of illness, came greater odds of enrollment into health insurance. However, Mirach et al. (2019) reported that households with good perceived family health status were 0.38 times less likely to enroll compared with those with poor family health.

Trust in the CBHI scheme has also been positively related with enrolment into it (Kwon, 2018; Nurie, 2017; Atnafu, 2018; Gobena, 2018). Studies by Nageso et al. (2020), Tadesse et al (2020), Wasike (2017) and Adebayo et al (2015) found a relationship between trust in insurance schemes and their uptake at household level. Nageso et al (2020) and Wasike (2017) reported that participants who had no trust in available scheme management were less likely to uptake CBHI. Consistently, Tadesse et al. (2020) also reported that having trust in the insurance program was related to having up to 4 times the odds of being enrolled in community-based health insurance. Chanie and Ewunetie (2020) similarly reported that participants with negative perceptions towards the CBHI scheme in terms of the scheme not being beneficial, and not being trusted decreased odds of enrollment into the scheme.

The perception of membership cost among household heads, has also been found to matter; Tadesse et al. (2020) reported that household heads who had a perception that the amount of membership contribution was medium were twice as likely to be members of a CBHI. Another study by Reshmi et al. (2018) found a relationship between the average annual household expenditure on health care and the chances of being enrolled in health care. They reported that expenditure of less than or equal to Rs. 3000 had taken up the CBHI schemes as compared to those who had spent more. The implication of those findings is that households that had spent less on health care were more likely to uptake CBHI.

There have been conflicting findings as regards what the effect of religion on health insurance enrollment is. Whereas some studies have reported that being a Muslim increases the chances of being enrolled, some have reported otherwise. Dixon et al. (2014) reported that females who

belonged to Muslim and Traditional religion were more likely to have enrolled compared to their Christian counterparts. However, Badu et al. (2018) reported that Muslims were less likely to have their health insurance active as compared with Christians. Surprisingly, Reshmi et al. (2018) reported that the likelihood of Muslims, Christians, and Jains to have active health insurance

One study by Kibret et al. (2019) reported that households that had ever borrowed for purposes of covering medical expenses were 2.7 times more likely to join CBHI scheme than those who had never borrowed for the same.

2.3 The health care service predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus

Given that enrollment into any health insurance schemes ultimately enables one to interface with available healthcare service providing facilities. That therefore brings in the importance of healthcare services in possibly predicting enrollment into health insurance schemes. Nageso et al. (2020) found a negative association between dissatisfaction with healthcare services provided and enrollment into CBHI. That finding is corroborated by Abdilwohab et al. (2021), Kigume and Maluka (2021), Atnafu et al. (2018), Shewamene et al. (2021) all of whom found poor healthcare services to be a barrier to CBHI enrolment. A perception of good quality of care was found to be related to 21 times higher odds of enrolment into a CBHI, by Fite et al. (2021).

However, studies by Atnafu et al. (2018), Mebratie (2015) and Adhikari et al. (2019) found particular relationships between travel time to the nearest health facility and enrollment into a health facility. All the three studies found found a negative association between enrolment to the scheme and travel time.

In the same context of local healthcare service provision, some studies have found accessibility to services to be related to enrollment into the CBHI (Ndomba et al., 2019; Maluka and Bukagire, 2014). Kado et al. (2020) reported that easy access to a public health facility increased the odds of enrollment into the CBHI by 2 fold.

Availability of medical equipment was positively related with enrolment into CBHI in studies by Atnafu et al. (2018), and Mebratie (2015)

Some studies (Wasike, 2017; Nageso et al., 2020) observed that the quality of health care services provided determined enrollment. The two studies reported that household's enrollment

in CBHI among respondents who were dissatisfied by services in nearby facility were also significantly less likely than those who were satisfied.

Some studies (Ndomba et al., 2019; Masengel et al., 2017) have also recorded significant relationships between stock outs at facility level and enrollment into CBHI. Masengel et al. (2017) reported that stock-out of essential drugs and supplies and longer waiting time in covered health facilities discouraged enrollment to schemes.

One study by Ndomba et al. (2019) reported particular relationships between the availability of health care workers and CBHI enrollment. They reported that their participants frequently found health facility closed for a whole day, which was a negative predictor of enrollment into a CBHI. Ndomba et al. (2019) also noted that there were severe shortages of health care providers in the health facilities, a situation discouraged members of the community from joining the CHF scheme.

In one study by Ndomba et al. (2019), what was also reported to be a determinant of enrollment into CBHI was the observation of the prioritization of patients who paid cash for their health care services, by the non-insured.

Waiting time for health care services at available health care facilities has also been found to predict enrolment into CBHI in studies by Entele (2016) and Mukangendo (2018). Mukangendo (2018) reported that they found an association between low enrolment to CBHI and long waiting time to be seen by a medical care provider and between services. Waiting time was also negatively related with the utilization of CBHI according to findings by Entele (2016)

Gebremeskel (2014) reported that long distance to a health care facility was negatively related with the participation in, enrolment to and Willingness to Join (WTJ) CBHI. However, studies by Atnafu et al. (2018), Mebratie (2015) and Adhikari et al. (2019) found particular relationships between travel time to the nearest health facility and enrollment into a health facility. All the three studies found a negative association between enrolment to the scheme and travel time.

2.4 The insurance scheme related predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus

Studies by Mukangendo (2018) and Masengel et al. (2017) found relationships between the affordability of premiums charged by insurance organizations and CBHI uptake. Mukangendo

(2018) showed that premium not being affordable affected enrollment. Similar findings were reported by Masengel et al. (2017). Surendar et al. (2019), Ayanore et al. (2019), Boateng et al. (2017) and Mladovsky (2014) found that a perception that insurance premium was high has a negative effect on enrollment into CBHI. Only one study (Atnafu et al., 2018) found high premiums to be related to increased odds of enrollment into CBHI.

Some studies have reported that the timing of premiums collection by insurance providing organizations affected enrollment. In a study by Nageso et al. (2020) it was found that participants who complained about the timing of collecting premium were significantly less likely than those who did not. Fadlallah et al. (2018) also reported that the amount and timing of premium collection had a negative influence on enrollment. Similar findings were reported by Wasike (2017).

Whereas sensitization about health insurance as a form of behavior change communication has been reported to be effective in increasing uptake of health insurance, some studies have found its significance to be negligible. Bocouma et al. (2020), for instance whose study included the provision of an information package about health insurance to over 2000 households, concluded that although there had been improvements in insurance knowledge, there was no significant effect on insurance uptake. However, it has been reported that sensitization about risk reduction and the need to save for health has been reported to have an effect on CBHI enrollment (Mirach et al, 2019). Studies by Mebratie (2015) and Macha (2014) concluded that non sensitization about risk reduction and health saving reduced the chances of enrollment.

The integration of community based insurance schemes and government structures have been found to uphold successful implementation of such schemes (Feleke, 2015), and thus increase enrollment. This was echoed in an earlier study by Fadlallah et al. (2018) who noted that government involvement, in scheme management, facilitated its implementation and enrollment rates.

Studies by Molla (2014), Mirach (2019), Abebe (2014) and Jembere (2018) found relationships between the nature of the benefits package and enrollment into CBHI. Fadlallah et al (2018) found that CBHI insurance packages that included both outpatient and inpatient health care cover were more likely to be enrolled into.

Administrative dynamics of community based health insurance schemes have also been reported to have an influence on enrollment into the CBHI. One study by Abebe (2014) revealed that the nature and dynamics of insurance organization administrations affected enrollment CBHI. They found that governance and administrative complexity of the insurance was a negative predictor to enroll to CBHI. In many studies, management committees and structures have been reported to be less trusted (Atnafu, 2018; Mladovsky et al., 2014), which has been found to have a negative influence on enrollment (Hussien and Azage, M, 2021; Nageso et al., 2020; Kamau and Njiru, 2014; Mladovsky et al., 2014). The lack of trust in insurance schemes is reported to be related to a lack of transparency, poor accountability (Ayanore et al., 2018) and managerial commitment (Abdilwohab et al., 2021), and non-transparent operations (Ayanore et al., 2018). Mistrust of scheme management and corruption tendencies were reported to be barriers to enrollment into CBHIs by Surendar et al. (2019), and Ayanore et al. (2019).

There have also been reports of some schemes not being all-embracing of other family members of the enrollee, to the extent that such exemptions affect enrollment. In some studies (Nsiah-Boateng et al., 2019; Adu, 2019; Duku et al. 2016), the exemption of family members like children and pregnant women increased enrollment into CBHI.

Panda (2014) reported that the offering of insurance through women's Self Help Groups (SHGs) increased the inclusiveness of the CBHI schemes. However, this study did not analytically come to that conclusion, that is, they did not use relationship analysis to deduce.

2.5 Literature summary and gap

There have been many studies conducted to assess enrollment into CBHI among persons in various economic sectors and across various age groups. Across all the studies on CBHI enrollment, the challenge of low enrollment is evident. However, one particular category of people has not received as much attention despite the disproportionate effect that non-access to healthcare can have on them. Their level of enrollment into CBHIs is not documented in most countries and neither are the predictors of their enrolment into the schemes. This study was conducted to assess the predictors of CBHI enrollment among diabetic patients, taking the context of Wakiso district in Uganda.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter covers the methodology that the study adopted in order to achieve its objectives. The chapter is organized into 10 sections in which descriptions and justification of the study design, study area, study population, sample size calculation, sampling procedures, data collection methods, and data collection tools, quality control techniques, data management and analysis plan, ethical considerations and the dissemination plan are covered.

3.1 Study design

This study used a cross sectional survey design, which is one of the positivist and hence quantitative designs used when there is an interest in quantifying the prevalence of a given outcome and establishment of its influencers (UN Women, 2020; Cherry, 2019). Such a situation was the case in the current study since one of the study aims was to determine the level of enrolment into Community based health insurance schemes with the other specific aims being the establishment of predictors to that effect. The other merit of the cross sectional design that further made it the most suitable design for this study is that it involved the use of questionnaires as the data collection tools, hence ensuring that all data collected can be quantifiable. That is in addition to the fact that every respondent sampled was studied in one instance (UN Women, 2020; Cherry, 2019), without need for follow up, implying that there was no need to find out whether non-enrollees had enrolled after some years. As such, with a cross sectional design, the study was able to concurrently obtain data on the current level of enrollment into the insurance scheme and its predictors.

3.2 Study area

The study was conducted among diabetic patients in Wakiso District; the largest district in central Uganda. The district was chosen as a study district among the many because it is among the few that have a community based health insurance scheme explicitly dedicated to providing insurance cover to diabetic patients. Most importantly however, despite presence of that scheme at some of the facilities in the district, the enrollment of diabetic patients therein has remain non-universal over years and sub optimal in some cases. The district is bordered to the North by Nakaseke and Luweero districts, to the east by Mukono district, to the south by Kalangala

district, to the Southwest by Mpigi district and to the Northwest by Mityana district (Wakiso District Local Government, 2021). The district is comprised of two counties (Busiro and Kyadondo), within which are 146 parishes, and 704 villages (Wakiso District Local Government, 2021). The district health system is comprised of 230 health center IIs, 155 health center IIIs, 15 health center IVs, and 10 hospitals (MOH, 2018). Among the health facilities in the district, two health center IVs (Kajansi and Wakiso) and one health center III (Bulondo) have currently operational CBHIs tailored for patients with diabetes. Therefore, those three health facilities served as the study sites within the district; with the additional premise being that they despite having tailored made CBHIs for diabetics, per facility; enrollment of targeted patients is far from universal.

3.3 Study population

This study targeted diabetic patients in Wakiso district. Specifically, the study population was diabetic patients who were receiving related care and treatment from Wakiso health center IV, Bulondo health center III and Kajansi health center IV, given that the three aforementioned facilities have running CBHI schemes with sub optimal diabetic patient enrollment. Diabetic patients were targeted because among them, the difference between a good quality of life and morbidity and/or mortality lies in optimal glycemic control that usually requires consistent access to glycemic control medication and care (Sendekie et al., 2022). Such healthcare access ought not to be interrupted by socio economic inequity, which can be significantly certain by health insurance.

3.3.1 Eligibility criteria

Inclusion

- The study included diabetic patients who had been registered as bona fide patients at the diabetic clinics of Wakiso health center IV, Bulondo health center III and Kajansi health center IV. This criterion was considered on the premise that, by being registered at those facilities, their inclusion would ensure that all data collected from them is representative of patients at the three facilities.
- The study included diabetic patients who had been receiving diabetic healthcare and treatment for at least 1 quarter (3 months) at any of the facilities with the insurance

scheme in place. Such a time allowance ensured that all sampled respondents had already been become familiar with the insurance scheme, and decided to enroll or not to enroll into it. With this criteria, data bias was minimized.

Exclusion

- The study excluded diabetic patients at Wakiso health center IV, Bulondo health center III or Kajjansi health center IV who had private healthcare insurance. That is because such patients do not need to be covered in any CBHI since having private insurance cover already guarantees them healthcare access.
- The study excluded patients who exhibited lethargy, or appear to be in severe pain related to diabetes or any other comorbidity given that such patients will not be expected to sustain a 40 minute interview without faltering, which may reduce the reliability of the study.

3.4 Sample size calculation

Sample size was calculated using the formula by Cochran (1955), whose choice was based on three presumptions. One of them was that there was no known prevalence (p) of enrollment of diabetic patients into a CBHI, which implied that the study was not in position to use formulae for single proportions. Secondly, the total number of diabetic patients at all the three targeted facilities was less than 10000 (they are 1204), with the implication that the study had to use a formula that caters for population correction in cases when the target population size is less than 10,000, if an accessible population size was to be computed.

With those two assumptions a formula by Cochran (1955) for population correction was adopted.

The formula is given by;

$$S = \frac{n_o}{1 + n_o / N}$$

Where;

S = required sample size

n = Sample size at a probability of 50% for an unknown magnitude such as the level of diabetics enrollment into CBHI = 384

N = Target population size

Therefore;

$$S = \frac{384}{1 + 384 / 1204}$$

$$S = \frac{384}{1 + 0.3189}$$

$$S = \frac{384}{1.3189}$$

$$S = 291$$

3.5 Sampling procedures

This study was conducted at three health facilities (Kajjansi HC VI, Wakiso health center IV, and Bulondo HC III), all of which were purposively sampled on the premise of being health facilities in Wakiso district that have CBHIs designed for diabetic patients. The three facilities have a total of 1204 diabetic patients some of whom are certainly enrolled into the said CBHI while some are not. The population size was sufficient to allow for the use of simple random sampling, and so, at each of the facilities, patients were sampled using simple random sampling. This was done by writing out 5 pairs of pieces of paper; with each pair being comprised of inscriptions of 'T' and 'X', with the former representing sampled. Each diabetic patient found in the waiting area was presented with the five pairs and requested to pick one piece of paper after a ruffle, without replacement. The paper picked was unfolded to reveal the letter inscribed and sampling status, with those picking letters with 'T' considered sampled. Such an approach ensured no sampling or selection bias, but, to avoid oversampling of patients, the sample size

was proportionated according to the target population size of diabetics at each of the facilities. That was done using the formula below;

$$N_0 = N_1 / N_2 \times n$$

Where;

N_0 = Number of diabetic patients required from a given facility

N_1 = Number of diabetic patients registered at that facility

N_2 = Total number of diabetic patients registered at all the three facilities

n = Sample size

Health facility	N_1	N_2	N	N_0
Kajjansi health center IV	543	1206	291	131
Wakiso health center IV	443	1206	291	107
Bulondo health center III	220	1206	291	53

3.6 Sources of data

This study used two sources of data, the first of which was primary data that was obtained during structured interviews with the diabetic patients. Secondary data sources, in the form of CBHI membership cards, which were reviewed to verify active membership in the CBHI and hence enrollment status into the scheme

3.7 Study variables

Table 1 below shows the variables that this study had, indicating that there were three independent variables including Intrapersonal characteristics, Health care service related characteristics and Scheme related characteristics. The attributes in those variables were measured as nominal, scale, and ordinal during analysis, and were analyzed at both descriptive, bivariable, multivariable levels.

Table 1: Description of the study variables

Variable type	Attributes	Measurement during analysis	Analysis type
Dependent variable	<p><u>Enrollment into diabetic patient CBHI</u></p> <ul style="list-style-type: none"> • Enrolled (Currently active member of the facility CBHI for diabetics) • Not enrolled (Not currently an active member of facility based CBHI) 	Nominal	Descriptive only
	<p><u>Intrapersonal characteristics</u></p> <ul style="list-style-type: none"> • Age • Gender • Awareness about CBHI • Perceived health status • Education level • Religion • Duration since diagnosis with diabetes • Diabetes type • Prognostic characteristics • Type of medication taken • Marital status 	Nominal and ordinal	Descriptive, bivariable, multivariable
Independent variables			
	<p><u>Health care service related characteristics</u></p> <ul style="list-style-type: none"> • Distance to facility • Travel time to health care facility • Availability of diabetes medication • Waiting time at facility • Favoritism of insured patients • Service level 	Nominal, scale and ordinal	Descriptive, bivariable, multivariable
	<p><u>Scheme related characteristics</u></p> <ul style="list-style-type: none"> • Amount of premium • Benefits package composition • Sensitization • Integration of CBHI within government structures • Packages covered in insurance scheme • Nature of administration • Exemption policies • Waiting time at insurance office • Trust in scheme 	Nominal, scale and ordinal	Descriptive, bivariable, multivariable

3.8 Data collection techniques/methods

The study used two data collection methods, one of which was structured interviews that were used to collect primary data from the patients, and the second being document review. Structured interviews were used to collect responses on socio demographics, enrollment status, intrapersonal, health service and scheme related characteristics in a close ended manner. During structured interviews, each of the patients was asked a similar set of questions, each of which was accompanied with a set of multiple choices from which each patient chose the most appropriate in their opinion. With such an interview method therefore, it was possible to collect quantifiable data that was descriptively and inferentially analyzed in all the four study objectives. That is in addition to the fact that by being close ended, structured interviews could be conducted within 40 minutes, which was of importance in the current study in which all interviews were conducted at exit, among patients, some of which were possibly in a hurry to get to their other destinations. However, structured interviews can only collect self-report and so were not be solely used to assess CBHI enrollment status. Therefore, document review was also used for the purpose of verifying self-reports of being enrolled into a given CBHI. With the document review, a patient who reported being an enrollee was requested to produce a membership form or card that shows current active membership in the CBHI.

3.9 Data collection tools

The information collected from structured interviews was captured on structured questionnaires, which were correspondingly designed with close ended questions. The questionnaires were primarily designed to capture close ended and hence quantifiable data, which additionally made them suitable for the study. The questionnaires were interviewer administered for purposes of ensuring that the data collected is valid and accurate. The questionnaire (Appendix B) was designed with five sections, A, B, C, D and E in which socio demographic, enrollment status, intrapersonal, health service and scheme related characteristics questions was covered respectively.

3.10 Data analysis and management plan

All filled questionnaires were mobilized from the data collection assistants and each of them checked for filling errors and completion while still in the field. Only two questionnaires that were found to have errors in filling, with at least one invalid response, and those two were compensated for by having two extra patients sampled, one at Wakiso health center IV and the other at Kajjansi health center IV. The questionnaires were then prepared for data entry, which was done in SPSS version 25 for windows. Each of the questions was accorded appropriate names, and labels and multiple choice responses given appropriate codes. The data in each questionnaire was then serially entered with code entry till completion. Manual perusal through each of the columns was done to look out for any entry errors and if none is found, analysis was conducted. The analysis was done at three levels including at univariate, bivariate and multivariate levels. Univariate analysis was conducted for all the variables in all the four study objectives, with the main aim of determining the frequency distributions and valid percentages of each.

For objective 1, only univariate analysis using descriptive frequencies was done given that that objective only required the quantification of the level of enrollment in the community based health insurance scheme. For variables in objective 2, 3 and 4, bivariate analysis was conducted to analyze the relationship between each of them and the dependent variable. The bivariate analysis was conducted using the log binomial model on the presumption that the level of enrollment into CBHI was found to be more than 10% at which magnitude the model (log-binomial) is considered to be among the most accurate (Greenland, 2004; Nijem et al., 2005; McNutt et al., 2003; Behrens et al., 2004). The alpha level was set at a significance of 5% and significant findings were reported using prevalence ratios along with their confidence intervals at 95%. However, when it came to the consideration of variables that could be taken for multivariable analysis, the alpha was raised to 0.2, in order to maximize on the chances of detecting all predictors of CBHI enrolment.

Variables from the relationships between intrapersonal, health service, scheme characteristics and enrolment into CBHI that had p values less than 0.2 were fitted into a multivariate log-binomial model in which they were adjusted for confounders. In order to determine the

predictor's of CBHI enrollment, level of statistical significance was set at 5% but with the findings reported in terms of adjusted prevalence ratios at 95% confidence.

3.11 Quality control techniques

The principal investigator recruited three persons who were tasked with aiding her collect data among a section of some of the patients as she engages others. Data collection assistants were necessary because the targeted health facilities were set kilometers apart from each other and yet they shared similar clinic days for diabetes patients, on which a large number of those patients is expected to turn up. The assistants were all graduates and already experienced in survey data collection. They were oriented about the study in a training session that was organized by the principal investigator a few weeks from the data collection. The training involved taking the assistants through each of the items in the questionnaire (Appendix B), and training them about how enrollment into CBHI was assessed. That was in addition to briefing the assistants about how the sampling was done at facility level and how the data was collected from a sampled patient.

Validity of the study tool was also tested prior to using it for pretesting and in the main data collection exercise. Content validity index (CVI) testing is purposed for indicating the extent to which a study tool along with all its items was able to achieve its intended use (obtaining data that was able to address the objectives). In computing the CVI, four persons regarded as experts in the area of health insurance were selected and given a rating scale that they used to rate each of the items in the questionnaire. The scale was as follows; 4 for a very relevant item, 3 for a relevant item, 2 for a somewhat relevant item and 1 for a non-relevant item. They were requested to rate the relevance of each item in terms of ability to address a corresponding objective. There ratings were as follows; 36, 32, 34 and 37, respectively. The mean number of items that had been rated as 4 or 3 were computed as follows; $36 + 32 + 34 + 37 = 139$. The CVI was computed using the formula below;

$$\text{CVI} = \frac{\text{Number of items rated 4 or 3}}{\text{Total number of items in the tool}} = \frac{139}{150} = 0.92$$

Therefore, since the CVI was found to be between 0.7 and 0.99, the tool was considered to be valid enough to be used during the training of the assistants and data collection.

Pre-test

The tool was pretested once among a section of 28 diabetic patients at Kiwoko Hospital which is one of the few facilities in Uganda that has a CBHII meant to be utilized by diabetic patients, but also faced with enrollment challenges. The facility is located in Nakaseke District and it was a suitable pre-test site for this study that was expected to yield pre-test information that could inform the conduction protocol of the main study. The pre-test was conducted with the main purpose of enabling the principal investigator to ascertain particular dynamics of data collection that may, if necessary, be used to prepare perhaps better for the main data collection exercise. The ease of sampling eligible staff, the length of the interviews, the comprehensibility of the questions to the patients, and whether there was need for direct translation or the translation of the entire tool to the local dialect. Any necessary adjustments were made on the tool before being used in the final data collection exercise, and those included the paraphrase of some questions, and amendment of responses in questions 21 and 22.

3.12 Ethical considerations

Approval to conduct this study was obtained from the research ethical committee of Clarke International University (Appendix C), and an introductory letter from the dean was used to seek permission from the district health office of Wakiso district. Each of the sampled patients was allowed to exercise their right to self-determination and consent by choosing to participate through written consent. Prior to seeking their consent, they were each briefed about the study, its procedures and what they were required of as participants. It was stressed to each respondent that their participation in this study was voluntary, to the extent that they had the right to decline participating in it at their own discretion. Confidentiality was also observed; all data provided was kept with the principal investigator and will only be shared with any other entity after concealing the identities of the respondents. The names of the respondents were not captured on questionnaires, as a way of upholding the ethic of anonymity. That is in addition to the fact that all interviews were conducted in private, that is, in an area where only the interviewee and interviewer were the only ones able to clearly listen to their interaction. All standard operating procedures for the prevention of COVID19 were also observed in order to protect the respondents from harm, them being among the persons with a high mortality risk due to the disease.

3.13 Dissemination plan

Since this study was conducted in a population that has not yet received much attention among investigators of CBHI dynamics, there is a plan to disseminate it widely starting with the University to which a copy will be provided. A copy will also be provided to the administrations of each of the CBHIs at Kajjansi health center IV, Bulondo health center III and Wakiso health center IV in addition to practically organizing meetings with them to verbally elaborate the findings to them. Following that, an article will be prepared for publication in one of the health journals with good impact.

CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter presents the findings of the study, organized in four sections, in which demographic, CBHI enrollment, and predictors of CBHI enrollment findings are presented, respectively. In section 4.3, there are three other sub sections in which the intrapersonal, healthcare service and scheme related predictor findings are presented.

4.1 Socio demographics

Table 1: Socio demographic characteristics of the patients

Variable	Category	Frequency	%
Gender of patient	Female	225	77.3
	Male	66	22.7
Age of patient	<20 years	4	1.4
	30-39 years	23	7.9
	40-49 years	75	25.8
	50-59 years	87	29.9
	60-69 years	76	26.1
	>69 years	26	8.9
Marital status	Single	62	21.3
	Married	135	46.4
	Cohabiting	4	1.4
	Separated	43	14.8
	Widow	44	15.1
	Widower	3	1.0
Religious denomination	Catholic	70	24.1
	Anglican	108	37.1
	Muslim	44	15.1
	SDA	8	2.7
	Born again	57	19.6
	Jehovah' Witness	4	1.4
Received formal education	Yes	256	88.0
	No	35	12.0
Level of education	Primary	145	56.6
	Secondary	91	35.5
	Post-secondary	20	7.8
Currently employed	Yes	124	42.6
	No	167	57.4

More than three quarters of the respondents 225(77.3%) were female, more than a quarter 87(29.9%) were in the age range of 50 to 59 years, while almost half of them 135(46.4%) were

married. More than a third of the patients 108(37.1%) were Anglican by religious denomination and 256(88.0%) and the majority had received formal education. Among those who were formally educated, more than half 145(56.6%) had been educated to primary level. The majority of the respondents 167(57.4%) were not employed

4.2 Enrollment into community based health insurance scheme

Table 2: Proportion of patients with diabetes mellitus in Wakiso district that is enrolled into community based health insurance schemes

Variable	Category	Frequency	%
Currently a member of the CBHI for diabetic patients at this facility	Yes	237	81.4
	No	54	18.6
Duration as member of diabetic patient CBHI	Less than 2 years	85	35.9
	More than 2 years	152	64.1
Plan to join the CBHI in the near future	Yes	50	92.6
	No	4	7.4
Period within which joining will be done	Less than a year	50	100.0

The majority of the patient 237(81.4%) were current members of the CBHI for diabetic patients at their respective facilities and nearly two thirds of them 152 (64.1%) had been members of the CBHI for more than 2 years. Almost all those who were not members at the time mentioned that they planned to join the CBHI in the near future 50(92.6%), with all of them intending to do so in less than a year 50(100.0%). Therefore, the proportion of patients with diabetes mellitus in Wakiso district that is enrolled into community based health insurance schemes is 81.4% (237).

4.3 Bivariable and multivariable analysis

4.3.1 Intrapersonal predictors

Table 3: of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda

Variable	f	%	Enrollment status		cPR (95% CI)	P value	aPR (95% CI)	P value
			Enrolled [237]	Not enrolled [54]				
Gender of patient								
Female	225	77.3	186(82.7%)	39(17.3%)	1.070 (0.926 - 1.235)	0.358		
Male	66	22.7	51(77.3%)	15(22.7%)	1.000			
Age of patient								
<20 years	4	1.4	0(0.0%)	4(100.0%)				
30-39 years	23	7.9	11(47.8%)	12(52.2%)				
40-49 years	75	25.8	61(81.3%)	14(18.7%)				
50-59 years	87	29.9	79(90.8%)	8(9.2%)				
60-69 years	76	26.1	64(84.2%)	12(15.8%)				
>69 years	26	8.9	22(84.6%)	4(15.4%)				
Marital status								
Single	62	21.3	42(67.7%)	20(32.3%)				
Married	135	46.4	116(85.9%)	19(14.1%)				
Cohabiting	4	1.4	0(0.0%)	4(100.0%)				
Separated	43	14.8	32(74.4%)	11(25.6%)				
Widow	44	15.1	44(100.0%)	0(0.0%)				
Widower	3	1.0	3(100.0%)	0(0.0%)				
Religious denomination								
Catholic	70	24.1	66(94.3%)	4(5.7%)	3.946 (1.183 - 13.162)	0.026*	3.982 (1.190 - 13.318)	0.025*
Anglican	108	37.1	77(71.3%)	31(28.7%)	0.594 (0.273 - 1.294)	0.190	0.631 (0.287 - 1.387)	0.252
Muslim	44	15.1	40(90.9%)	4(9.1%)	2.391 (0.706 - 8.102)	0.161	2.779 (0.791 - 9.762)	0.111
SDA	12	4.1	8(66.7%)	4(33.3%)	0.478 (0.122 - 1.880)	0.291	0.456 (0.114 - 1.822)	0.266
Born again	57	19.6	46(80.7%)	11(19.3%)	1.000		1.000	
Received formal education								
Yes	256	88.0	206(80.5%)	50(19.5%)	0.532 (0.179 - 1.575)	0.254		
No	35	12.0	31(88.6%)	4(11.4%)	1.000			
Level of education								
Primary	145	56.6	115(79.3%)	30(20.7%)	5.750 (2.157 - 15.331)	0.000*	4.655 (1.608 - 13.480)	0.005*
Secondary	91	35.5	83(91.2%)	8(8.8%)	15.562 (4.919 - 49.241)	0.000*	12.749 (3.716 - 23.735)	0.000*
Post-secondary	20	7.8	8(40.0%)	12(60.0%)	1.000		1.000	
Currently employed								
Yes	124	42.6	100(80.6%)	24(19.4%)	0.912 (0.503 - 1.655)	0.763		
No	167	57.4	137(82.0%)	30(18.0%)	1.000			

Aware of the CBHI for diabetic patients								
Yes	248	85.2	237(95.6%)	11(4.4%)				
No	43	14.8	0(0.0%)	43(100.0%)				
Main function of the CBHI for diabetic patients								
Provide a psychosocial support for diabetic patients	19	6.5	19(100.0%)	0(0.0%)				
Provide medical cover to diabetic patients whenever they need it	124	42.6	120(96.8%)	4(3.2%)				
Provide psychosocial support, medical cover & Collect money from patients, in form of saving	62	21.3	62(100.0%)	0(0.0%)				
Provide a psychosocial support for diabetic patients & Provide medical cover to diabetic patients whenever they need it	16	5.5	16(100.0%)	0(0.0%)				
Provide medical cover & Collect money from patients in form of saving	20	6.9	20(100.0%)	0(0.0%)				
Don't	50	17.2	0(0.0%)	50(100.0%)				
My blood glucose levels are well controlled								
Strongly agree	32	11.0	28(87.5%)	4(12.5%)	1.312 (0.260 - 6.619)	0.742	1.580 (0.276 - 9.036)	0.607
Agree	177	60.8	154(87.0%)	23(13.0%)	1.255 (0.339 - 4.647)	0.733	1.369 (0.339 - 5.535)	0.659
Disagree	63	21.6	39(61.9%)	24(38.1%)	0.305 (0.080 - 1.156)	0.081	0.630 (0.150 - 2.635)	0.526
Strongly disagree	19	6.5	16(84.2%)	3(15.8%)	1.000		1.000	
Generally rate of health status								
Am very healthy	74	25.4	63(85.1%)	11(14.9%)	3.316 (1.244 - 8.840)	0.017*	6.090 (2.181 - 17.003)	0.001*
Somewhat healthy	187	64.3	155(82.9%)	32(17.1%)	2.804 (1.217 - 6.460)	0.015*	16.526 (5.001 - 24.611)	0.000*
Sickly	30	10.3	19(63.3%)	11(36.7%)	1.000		1.000	
Type of diabetes								
Type 1	12	4.1	8(66.7%)	4(33.3%)	0.812 (0.542 - 1.216)	0.313		
Type 2	279	95.9	229(82.1%)	50(17.9%)	1.000			
Time since diagnosis with diabetes								
Less than 5 years	152	52.2	109(71.7%)	43(28.3%)	0.218 (0.107 - 0.443)	0.000*	0.269 (0.127 - 0.568)	0.001*
More than 5 years	139	47.8	128(92.1%)	11(7.9%)	1.000		1.000	
Ever missed medication because couldn't pay								
Yes	117	40.2	91(77.8%)	26(22.2%)	0.671 (0.370 - 1.216)	0.189	0.975 (0.880 - 1.080)	0.624
No	174	59.8	146(83.9%)	28(16.1%)	1.000			
Ever suffered from any complications of uncontrolled diabetes (chronic hyperglycemia)								
Yes	132	45.4	110(83.3%)	22(16.7%)	1.260 (.692 - 2.295)	0.450		
No	159	54.6	127(79.9%)	32(20.1%)	1.000			

More than three quarters of the patients 248(85.2%) reported that they were aware of the CBHI for diabetic patients, and the majority agreed that their blood glucose levels are well controlled 177(60.8%). Nearly two thirds of the respondents generally rated their health status as being somewhat healthy 187(64.3%), whilst almost all of them were living with type 2 diabetes 279(95.9%). Form more than half of the patients, it had been less than 5 years since they had been diagnosed with diabetes 152 (52.2%). The majority of the patients reported that they had never missed medication because couldn't pay 174(59.8%), and that they had never suffered from any complications of uncontrolled diabetes (chronic hyperglycemia 159 (54.6%).

All the four intrapersonal characteristics that were statistically significant at bivariable level remained statistically significant after adjustment for confounders. The prevalence of CBHI enrollment was nearly 4 times as high among patients who were Catholics (aPR = 3.982 [CI = 1.190 - 13.318], P = 0.025) compared to those who were born again. Patient who had been educated to secondary school showed 12 times more chances of being enrolled, compared to those who had received post-secondary education (aPR = 12.749 [CI = 3.716 - 43.735], P = 0.000). Patients who rated their health status as being somehow okay had 16 times the odds of being enrolled (aPR = 16.526 [CI = 5.001 - 54.611], P = 0.000) compared to those who were sickly.

The prevalence of enrollment was less by 73% among patients who had lived with diabetes for less than 5 years (aPR = 0.269 [CI = 0.127 - 0.568], P = 0.001), compared to those who had lived with the disease for more than five years.

4.3.2 The health care service predictors

Table 4: The health care service predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda

Variable	F	%	Enrollment status		cPR (95% CI)	P value	aPR (95% CI)	P value
			Enrolled [237]	Not enrolled [54]				
Type of medication prescribed for diabetes management								
Oral medication	182	62.5	162(89.0%)	20(11.0%)				
Injectable Insulin	105	36.1	71(67.6%)	34(32.4%)				
Both Oral medication & Injectable Insulin	4	1.4	4(100.0%)	0(0.0%)				
Accessibility to healthcare facilities in this area								
Easy	223	76.6	183(82.1%)	40(17.9%)	1.033 (0.902 - 1.184)	0.635		
Difficult	68	23.4	54(79.4%)	14(20.6%)	1.000			
Travel time to reach a health facility								
Less than 30 minutes	102	35.1	90(88.2%)	12(11.8%)	2.143 (1.071 - 4.286)	0.031	1.496 (0.735 - 3.043)	0.267
More than 30 minutes	189	64.9	147(77.8%)	42(22.2%)	1.000		1.000	
Distance to nearest diabetes care and treatment providing facility								
Less than 1km	31	10.7	31(100.0%)	0(0.0%)				
More than 1km	260	89.3	206(79.2%)	54(20.8%)				
Diabetes medication always available at this health facility								
Yes	151	51.9	131(86.8%)	20(13.2%)	2.101 (1.143 - 3.862)	0.017	1.979 (1.066 - 3.671)	0.030*
No	140	48.1	106(75.7%)	34(24.3%)	1.000		1.000	
Sought a refill of diabetes medication and told that they were out of stock								
Yes	181	62.2	139(76.8%)	42(23.2%)	0.405 (0.203 - 0.809)	0.010	0.513(0.206 - 1.279)	0.152
No	110	37.8	98(89.1%)	12(10.9%)	1.000		1.000	
Waiting time to receive diabetes related healthcare services at this facility								
Less than 30 minutes	11	3.8	7(63.6%)	4(36.4%)	0.380 (0.107 - 1.349)			
More than 30 minutes	280	96.2	230(82.1%)	50(17.9%)	1.000			
Insured diabetic patients favored more when it comes to receiving healthcare at this facility								
Yes	54	18.6	46(85.2%)	8(14.8%)	1.385 (0.612 - 3.134)	0.435		
No	237	81.4	191(80.6%)	46(19.4%)	1.000			

The majority of the patients interviewed 182(62.5%) were taking oral medication, and they rated their accessibility to healthcare facilities in their areas of residence, as easy 223(76.6%). Nearly two thirds of the respondents mentioned that they travelled for more than 30 minutes 189 (64.9%) to reach the facility from which they received diabetes related care and treatment. More than three quarters of the patients reported that their nearest diabetes care and treatment providing facilities were located more than 1km away from their households 260(89.3%). Slightly more than half of the patient's 151(51.9%) reported that their medications were always available at the health facilities, while the majority of them also mentioned that they had ever sought a refill of diabetes medication and told that they were out of stock 181(62.2%).

Almost all the patients 280 (96.2%) reported that they waited for more than 30 minutes to receive diabetes related healthcare services at their respective health facilities. The majority of them 237(81.4%) denied that insured diabetic patients were favored more when it comes to receiving healthcare at this facility.

Of the three healthcare service characteristics that showed statistical significance at bivariable level, only one remained statistically significant after adjustment for confounders. The prevalence of enrollment into the CBHI for diabetic patients was higher by 98% among patients who reported that diabetes medication was always available at their respective health facilities (aPR = 1.979 [CI = 1.066 - 3.671], P = 0.030) compared to those who reported that diabetes medication was not always available.

4.3.3 Insurance scheme related predictors

Table 5: The insurance scheme related predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda

Variable	F	%	Enrollment status		cPR (95% CI)	P value	aPR (95% CI)	P value
			Enrolled [237]	Not enrolled [54]				
The amount of premium charged by the CBHI is affordable to any diabetic patient								
Agree	137	47.1	137(100.0%)	0(0.0%)				
Disagree	105	36.1	100(95.2%)	5(4.8%)				
Don't know (Not a Member of the CBHI)	49	16.8	0(0.0%)	49(100.0%)				
The benefits package provided by the CBHI for diabetic patients is sufficient enough to cater for healthcare needs of any diabetic patient insured								
Agree	108	37.1	108(100.0%)	0(0.0%)				
Disagree	134	46.0	129(96.3%)	5(3.7%)				
Don't know (Not a Member of the CBHI)	49	16.8	0(0.0%)	49(100.0%)				
Administrators of the CBHI for always sensitize diabetic patients to enroll into the insurance scheme								
Agree	227	78.0	227(100.0%)	0(0.0%)				
Disagree	14	4.8	10(71.4%)	4(28.6%)				
Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)				
CBHI scheme integrated into the local government structures of the district								
Agree	169	58.1	169(100.0%)	0(0.0%)				
Disagree	72	24.7	68(94.4%)	4(5.6%)				
Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)				
CBHI scheme for diabetic patients is integrated into the administrative structures of the facility								
Agree	199	68.4	199(100.0%)	0(0.0%)				
Disagree	42	14.4	38(90.5%)	4(9.5%)				
Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)				
The administration of the CBHI is very accountable								
Agree	230	79.0	230(100.0%)	0(0.0%)				
Disagree	11	3.8	7(63.6%)	4(36.4%)				

Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)
The administration of the CBHI is very transparent				
Agree	236	81.1	236(100.0%)	0(0.0%)
Disagree	5	1.7	1(20.0%)	4(80.0%)
Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)
The CBHI only covers diabetic patients and not their relatives or family				
Agree	230	79.0	185(100.0%)	0(0.0%)
Disagree	11	3.8	52(92.9%)	4(7.1%)
Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)
Registration into the CBHI for diabetics is very bureaucratic				
Agree	87	29.9	87(100.0%)	0(0.0%)
Disagree	154	52.9	150(97.4%)	4(2.6%)
Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)
I trust the insurance scheme for diabetics				
Strongly agree	237	81.4	237(100.0%)	0(0.0%)
Agree	4	1.4	0(0.0%)	4(100.0%)
Don't know (Not a Member of the CBHI)	50	17.2	0(0.0%)	50(100.0%)

No computation of bivariable or multivariable analysis was made because all the cross tabulations had a null integer in at least one of their cells.

Almost half of the patients agreed that the amount of premium charged by the CBHI is affordable to any diabetic patient 137(47.1%), but disagreed that the benefits package provided by the CBHI for diabetic patients is sufficient enough to cater for healthcare needs of any diabetic patient insured 134(46.0%). The majority of the patients 227(78.0%) agreed that administrators of the CBHI for always sensitize diabetic patients to enroll into the insurance scheme, that the CBHI scheme is integrated into the local government structures of the district 169(58.1%), that the CBHI scheme for diabetic patients is integrated into the administrative structures of the facility 199 (68.4%) and that the administration of the CBHI is very accountable Agree 230 (79.0%).

More than three quarters 236 (81.1%) of the patients interviewed reported that the administration of the CBHI is very transparent, and agreed that the CBHI only covers diabetic patients and not their relatives or family 230(79.0%). However, more than half of the respondents 154(52.9%) disagreed that the registration into the CBHI for diabetics is very bureaucratic. More than four fifths of the respondents strongly agreed that they trusted the insurance scheme for diabetics 237(81.4%).

However, no bivariate analysis could be conducted because of the null integers in the cells of all cross tabulations between the independent variables and the dependent variable. However, the null integers notwithstanding, it is evident from the cross tabulations that there could have been a statistically significant difference in the number of patients who agreed to the assertions, that had been enrolled in to the CBHI scheme.

All patients who agreed that the amount of premium charged by the CBHI is affordable to any diabetic patient, that the benefits package provided by the CBHI for diabetic patients is sufficient enough to cater for healthcare needs of any diabetic patient insured, that administrators of the CBHI for always sensitize diabetic patients to enroll into the insurance scheme, that the CBHI scheme is integrated into the local government structures of the district, that the CBHI scheme for diabetic patients is integrated into the administrative structures of the facility, that the administration of the CBHI is very accountable, that the administration of the CBHI is very transparent, that the CBHI only covers diabetic patients and not their relatives or family, that the registration into the CBHI for diabetics is very bureaucratic and that they trusted the insurance scheme for diabetics were enrolled into the scheme.

CHAPTER FIVE: DISCUSSION

5.1 The proportion of patients with diabetes mellitus in Wakiso district that is enrolled into community based health insurance schemes

There are more people living with diabetes (>400 million) than there are people annually, than there are people infected with tuberculosis, HIV, and malaria combined, annually (WHO, 2022a; WHO, 2022b). However, the high burden of diabetes is only one part of the problem, one of the main challenges faced by people with diabetes is poor glycemic control, than in part arises from non-access to medication, that is mediate by financial constraints. Knowledge of that fact led to the development of insurance schemes that could provide an economic buffer and ensure that each of the diabetic patients has unlimited access to diabetes medication, without out of pocket expenditure (Al-Hanawi et al., 2020; Al-Hanawi et al., 2021; Sriram et al., 2020; Harish et al., 2020; Ahmed, 2020). However, like other health general CBHI's there were reports that diabetic patient CBHIs were also marred with enrollment challenges, albeit without much evidence to that effect. This study, that was conducted among diabetic patients in Wakiso district, to some extent, differed from the aforementioned assumption given that the proportion of patients with diabetes mellitus in the district that were enrolled into community based health insurance schemes was found to be 81.4% (237). This is quite a high level of enrollment into the Community Health Insurance Scheme; since it translates to about 8 in every 10 diabetic patients being actively enrolled into the scheme tailored to enable them have consistent access to medication. From a programmatic and policy perspective, this finding is quite reassuring that the administrators of the CBHI scheme for diabetic patients in Wakiso district have gone to great lengths to promote the CBHI among diabetic patients, perhaps through mass sensitization.

However, the current level of enrollment into the CBHI, despite being high, would be better if universal or near-universal as it is supposed to be. About 2 in every 10 diabetic patients in the district, that access healthcare from facilities that have the CBHI in place, are not enrolled into the scheme. That also implies that 2 in every 10 diabetic patients who receive related care and treatment from Wakiso, Kajjansi, and Bulondo health center IVs may be at risk for not only having intermittent access to diabetes medication, but also catastrophic health expenditure (CHE) that may arise from out of pocket expenditure. Such a scenario is a possibility, given that stock

outs of diabetes medications are a common occurrence in government owned Ugandan facilities (Mukundiyukuri et al., 2020; Kibirige et al., 2017; Lugada et al. 2020).The resultant CHE may result into non-adherence to medication, hyperglycemia, increased insulin resistance, and all effects of poor controlled blood glucose including multi-organ dysfunction, and a multitude of cardiovascular complications including coronary artery disease. It is from such sequelae that direct healthcare costs increase more; making access to healthcare even more challenging, for 20% of the diabetic patients, whose mortality risk will certainly increase if enrollment into the CBHI is not increased more.

On a more positive note however, a comparison and contrast of the level of enrollment into insurance among diabetic patients in Wakiso and persons in other studies reveals that the level or enrollment in the study area was significantly higher than what was reported in other studies. It was higher than what was reported in India by Reshmi et al. (2021) (14%),and the National Statistical Office (2019) (18%), in Indonesia by Muttaqien et al. (2021) (25%), in Pakistan by Habib and Zaidi (2021) (<80%),in a systematic review by Shewamene et al. (2018) (69.6%), in Nigeria by Yusuf et al (2019) (4.5%), Aregbeshola et al. (2018) (2.1%),Akwaowo et al. (2018), and Ridde et al.(2018). The level of enrollment among diabetic patients in Wakiso is also higher than what was reported by Kado et al. (2020), Nageso et al. (2020) (12.8%), Abdilwohab et al. (2021) (33.30%), Taddesse et al (2020) (35%), Masengel et al. (2017) (11% and 20%), Wasike (2017) (27.1%). The fact that the majority of the aforementioned studies have reported significantly lower levels of enrollment buttresses assertions by numerous previous studies which had it that low enrollment into community based health insurance schemes was a global challenge (Renggli et al., 2019; Joseph, 2017; Maluka, 2014; van Hees et al., 2019; Kanmiki et al., 2019; Abiola et al., 2019).

However, it should be noted that unlike all the aforementioned studies with lower enrollment levels, the current study included only diabetic patients, who by virtue of having a chronic disease condition that requires life-long treatment, may have had a higher perceived need to have health insurance cover of any sort. Secondly, the CBHI schemes that were considered in this studywere all localized and housed at particular facilities from which the respondents were receiving treatment from. As such, the respondents in this study were more exposed to the health

insurance scheme they were supposed to enroll into. Such a privilege may not have been available to respondents in all the other studies that have been compared with. To most of the respondents in those studies, CBHI scheme administrators were not as available as those at facilities in Wakiso, and the respondents in those same studies weren't as frequently exposed to behavior change communication as those in the current study. Therefore, there was a justifiable difference between the findings of this study and the findings of other studies which had no diabetic patients as respondents. On a more positive note, of the patients who were found not to be currently enrolled into the scheme, the majority mentioned that they intended to join within a years' time (Table 2).

5.2 Intrapersonal predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda

The triadic theory of influence suggests that behavior such as enrollment into a CBHI such as that for diabetic patients is influenced at three levels, one of which is the proximal (personal level). The findings of this study fully agreed with the supposition by the triadic theory of influence, as has been the case in many other studies (Fite et al., 2021; Basaza et al., 2019; Mirach et al., 2019; Kanmiki et al., 2019; Demissie and Atnafu, 2021; Shewamene et al., 2021). Four intrapersonal characteristics were found to be statistically significant predictors of enrollment into the CBHI. One of the predictors identified was religion, for which the prevalence of CBHI enrollment was nearly 4 times as high among patients who were Catholics (aPR = 3.982 [CI = 1.190 - 13.318], P = 0.025) compared to those who were born again. This finding implies that Catholic diabetic patients were more likely to be enrolled into the CBHI than patients in other religions, contrary to findings by Dixon et al. (2014), Badu et al. (2018) and Reshmi et al. (2018) in which Muslims were found to have a higher likelihood of enrolment into a CBHI. The difference in the findings could have stemmed from the difference in study settings, given that the other studies were conducted in settings (India and Ghana) with a significantly higher Muslim population than Uganda (Benedikt, 2021; Sasu, 2022), that believes in Islam compliant Insurance (Takaful). However, in the Ugandan setting the Catholic community unlike all other religions went step ahead to promote insurance penetration in the Catholic community of Uganda by setting up a fully-fledged insurance company (Pax insurance). Catholic community leaders have gone ahead to sensitize all Catholics about the need for insurance, with the implication that

Catholics have gained increasing awareness about the need for insurance to the extent that when it comes to the CBHI for diabetics, Catholic patients find it even more easier to enroll, given their prior awareness of enrollment benefits (). The positive effect of awareness of insurance on enrollment has already been established in previous studies (Fite et al., 2021; Basaza et al., 2019; Mirach et al., 2019; Ghaddar et al., 2018; Michael et al., 2019; Ogundeji et al., 2019; Macha et al., 2014; Kado et al., 2020; Abdilwohab et al., 2021).

The positive effect of awareness about health insurance, on enrollment into health insurance schemes is more likely to be more eminent and realized among patients who are educated. It is not surprising that patient who had been educated to secondary school showed 12 times more chances of being enrolled, compared to those who had received post-secondary education (aPR = 12.749 [CI = 3.716 - 43.735], P = 0.000). This is consistent with findings by Atnafu et al. (2018), Badu et al. (2018), Alatinga (2015), Kimani et al. (2014), and Manortey (2014a), Nageso et al. (2020), Al-Hanawi et al. (2018), Badu et al. (2018) and Maina (2016). However, the particular finding in this study indicated that whereas the chances of enrolling increased with increase in education level, they tapered when it came to patients who had been educated to post-secondary level. This may have been related to the fact that more highly educated people are more likely to have or at least contemplate having private health insurance, or consider themselves to be economically sound enough to procure diabetes medication in case they have to (Alesane et al., 2018). Such perceptions are certainly antagonistic to CBHI enrollment but are protagonists to private insurance.

The study also revealed that patients who rated their health status as being somehow okay had 16 times the odds of being enrolled (aPR = 16.526 [CI = 5.001 - 54.611], P = 0.000) compared to those who were sickly. This finding implies that perceived good health status increased odds of enrollment contrary to findings by Fite et al. (2021) and Abdilwohab et al. (2021) who found that it is being sickly that increased odds of enrolment into the CBHI. A perception of good health status, at least in the context of diabetes management, calls for a need to have ones' health only get better, which for diabetic patients, calls for unabated access to medication. It is only with such access that optimal glycemic control can be achieved and a good health status maintained. Consequently, diabetic patients who rate themselves as healthy tend to be less hesitant to join a

health insurance scheme that can guarantee access to medication even when there are stock outs at facility level. The dynamics change when it comes to patients who perceive themselves as sickly; for them, the persistent hyperglycemia and diabetes sequelae cause severe morbidity that calls for more healthcare costs, which the CBHI doesn't cover. For sickly patients therefore, the CBHI becomes of little relevance since they not only be in a position of requiring drugs like Metformin as guaranteed by the scheme, but also treatment for other complications, not covered by the scheme.

There is evidence that the effect of diabetes morbidity becomes more pronounced among patients who have lived with the disease for a shorter timeframe (Ghouse et al., 2019; Herrington et al., 2018). Therefore, there is more likelihood of patients who have lived with diabetes for less than five years, to be sicklier, as they try to cope with dietary changes and daily medication for blood glucose control. Such patients, as explained earlier are less likely to enroll into a CBHI which only guarantees access to diabetic medication, with no cover for other health issues. That explains why the prevalence of enrollment was less by 73% among patients who had lived with diabetes for less than 5 years (aPR = 0.269 [CI = 0.127 - 0.568], P = 0.001), compared to those who had lived with the disease for more than five years.

5.3 The health care service predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda

The study found a relationship between institutional characteristics and enrollment, however, unlike intrapersonal predictors, the study identified only one healthcare service predictor of enrollment into the community based health insurance schemes among patients with diabetes mellitus in Wakiso district. That healthcare service characteristic was the constant availability of diabetes medication. The study found that the prevalence of enrollment into the CBHI for diabetic patients was higher by 98% among patients who reported that diabetes medication was always available at their respective health facilities (aPR = 1.979 [CI = 1.066 - 3.671], P = 0.030) compared to those who reported that diabetes medication was not always available. This finding is similar to findings by Atnafu et al. (2018), and Mebratie (2015). The positive effect of having medications available has multiple pathways, one of which is reassurance that the CBHI will be

in position to guarantee access to the same medications even when stock outs happen. Such confidence builds trust in the scheme, which trust has been found to be independently protective of enrollment into CBHI schemes (Kwon, 2018; Nurie, 2017; Atnafu, 2018; Gobena, 2018; Nageso et al., 2020; Taddesse et al., 2020; Wasike, 2017; Adebayo et al., 2015; Chanie and Ewunetie, 2020).

Besides the trust built by drug availability, it also cultivates more satisfaction with the quality of care provided at facility level, and hence higher enrollment into the available health insurance scheme (Nageso et al., 2020; Abdilwohab et al., 2021; Kigume and Maluka, 2021; Atnafu et al., 2018; Shewamene et al., 2021; Fite et al., 2021). The third pathway is through being an antagonist of drug stock outs; having drugs available at all times implies that stock outs are minimal, and that alone builds trust in the scheme, increasing enrolment, as has been found to be the case in previous studies (Ndomba et al., 2019; Masengel et al., 2017; Masengel et al., 2017). The fact that drug availability can influence enrollment into the CBHI through influence on multiple other institutional variables, makes it not surprising that it (availability) was the only healthcare service variable that was significant in this study.

5.4 The insurance scheme related predictors of enrollment into community based health insurance schemes among patients with diabetes mellitus in Wakiso district – central Uganda

According to the Triadic theory of influence, it was expected that insurance scheme related characteristics would be of significance in predicting enrollment into the CBHI. However, as earlier mentioned, no bivariate analysis could be conducted because of the null integers in the cells of all cross tabulations between the independent variables and the dependent variable. Going by the findings in table 5, it is evident that the null integers came from the fact that some respondents, who were not members of the CBHI scheme were not aware about certain dynamics of the scheme that were asked during the structured interview, and they all happened to be in the outcome category of ‘Not enrolled’, leaving a null integer in all cross tabulations.

Nonetheless, going by the absolute figures in the cross tabulations, particularly in the outcome category of ‘Enrolled’, it is evident that all respondents (100%) who agreed to the assertions were enrolled into the scheme (Table 5). All patients who agreed that the amount of premium charged by the CBHI is affordable to any diabetic patient, that the benefits package provided by

the CBHI for diabetic patients is sufficient enough to cater for healthcare needs of any diabetic patient insured, that administrators of the CBHI for always sensitize diabetic patients to enroll into the insurance scheme, that the CBHI scheme is integrated into the local government structures of the district, that the CBHI scheme for diabetic patients is integrated into the administrative structures of the facility, that the administration of the CBHI is very accountable, that the administration of the CBHI is very transparent, that the CBHI only covers diabetic patients and not their relatives or family, that the registration into the CBHI for diabetics is very bureaucratic and that they trusted the insurance scheme for diabetics were enrolled into the scheme. It suffices to mention that had it not been for the null integers, there would have been statistical significance noted across all the variables. In other words, all the scheme related variables would have turned out to be statistically significant and consistent with findings from other studies like Mukangendo (2018) and Masengel et al. (2017), Masengel et al. (2017), Surendar et al. (2019), Ayanore et al. (2019), Boateng et al. (2017) and Mladovsky (2014), Atnafu et al. (2018), Atnafu (2018) and Hussien and Azage (2021) would have been noted. All the scheme related characteristics may have had a protective effect on enrolment into the CBHI.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Enrollment into the CBHI among diabetic patients in Wakiso district is high, but not universal, contrary to ideal standards. It is mainly predicted by intrapersonal characteristics and to some extent by institutional characteristics, although it is possible that scheme characteristics may have also been of conceivable importance. The intrapersonal characteristics included religion, education level, perceived health status and duration with diabetes. Only one healthcare service characteristic predicted enrollment into the Community Based Health Insurance Scheme, it is the availability of medications at the facility.

6.2 Recommendations

6.2.1 For practice

There is need to achieve a high level of awareness about the benefits of insurance among all diabetic patients that subscribe to all religions, as is the case among Catholics. That can be done by adopting an intensive decentralized model of sensitization that the Catholic Church uses. The scheme administrators are urged to designate a dedicated health educator and behavior change communication staff tasked to educate diabetic patients about the available CBHI, how it works, what it takes to be a member and the benefits of being a member to all non-enrolled patients. With such education provided repetitively, it is highly likely that awareness across board, irrespective of religious affiliation.

With the aforementioned health education and sensitization program adopted awareness will be created among all the diabetic patients even to the level of people who have been formally educated. In other words, the effect of formal education on enrollment may be achieved through the education provided to patients.

The health education program provided to all patients should include particular emphasis on the fact that being sickly or morbid due to diabetes shouldn't imply that one doesn't need to be a member of a CBHI. The patients should be informed that however minimal the CBHI package may be, it can still go a long way in reducing CHE even in cases of complications not covered under the scheme.

The administrators of the diabetic patient CBHI scheme should liaise with the respective administrations of the facilities with the CBHI schemes to always ensure that there is consistent supply of diabetic medication and consumables. A CBHI delegate could be placed at each facility to monitor stock levels of diabetic medication and supplies, in conjunction with a designate facility staff so that in case of any impeding stock outs, more can be procured using the pull system.

6.2.2 Further studies

For further study, it will be prudent to have a qualitative study done targeting only those who are not enrolled, to explore their barriers to enrollment into the CBHI, using focus group discussions or in-depth interviews.

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APPENDIX A: CONSENT FORM

Title of study: Predictors of enrollment into community based health insurance schemes and patients with type II diabetes mellitus in Wakiso district – central Uganda

Principal investigator: Sarah Komugisha

Introduction: Universal Health Coverage (access to quality healthcare by every one without financial burden) is one of the most important global agendas currently especially given the rising cost of healthcare and the socio economic inequity that has been perpetuated by COVID19. However, whereas all patients need to pay for healthcare, those with chronic disease face a higher burden of direct healthcare costs since they have to continuously receive treatment for their diseases. One particular group of patients stands out in that respect, that is, patients with diabetics who need to keep their blood glucose levels in check at all times. Any gaps in healthcare access due to financial limitations can therefore increase risk of mortality from the disease and so, such patients need to have health insurance cover. Currently, CBHI schemes are the most common and some have been customized for diabetes patients, and three of those are in Wakiso district.

Purpose: The purpose of the study will be to assess predictors of enrollment into community based health insurance schemes and patients with type II diabetes mellitus in Wakiso district – central Uganda

Who the study is targeting: The study is targeting Type II diabetic patients, who receive care from Wakiso health center IV, Bulondo health center III, Kajjansi health center IV

Why you have been sampled: You have been sampled because you happen to be a diabetes patients who has received healthcare services from either Wakiso health center IV, Bulondo health center III, or Kajjansi health center IV for at least 2 months. That makes you eligible for the study

What you will be required of: If you choose to participate in the study, you will only be required to participate in a structured interview in which you will be asked questions related to socio demographic, CBHI enrollment, individual and institutional characteristics in a close ended manner.

Risks of participation: Since you will only be required to participate in interviews and not any experiment, we do not expect you to experience any side effects or be at risk of any trauma before, during or after participation in the study.

Benefits of participation: The administrations of the respective CBHIs at Kajansi health center IV, Bulondo health center III and Wakiso health center IV will certainly be a beneficiary of the findings of the study given that till now, what they have known to be the predictors of enrollment of into the CBHI are largely anecdotal. With the findings, it is expected that the administrators of the scheme will be evidently informed about what predicts enrollment of the many diabetic patients, at patient, health care service and scheme levels. The administrators may thus be able to make necessary policy adjustments tailored to averting any attributes that may be found not to be protective of enrollment.

The study may be of significance to diabetic patients within Wakiso district and perhaps those beyond the district as well. That will be to the effect that when disseminated, the patients will not only get to know the imperativeness of being medically insured as diabetic patients but also what their enrollments are and what determines that enrollment at the level of the patient. The prevalence of enrollment into CBHI, if found to be low or sub optimal, may independently trigger behavior change among non-enrolled diabetic patients in Wakiso district. The non-enrolled will also get to know which of their intrapersonal characteristics is not protective of enrollment, which may empower them to perhaps make personal initiatives to make necessary personal modifications.

Since part of the findings will highlight the healthcare service related predictors of enrollment into the community health insurance scheme for diabetics, this study will also be of significance to health care providers and leaders in Wakiso district. Those persons will also be informed about which of the institutional characteristics are protective of diabetics' enrollment into the CBHI and those which are not, so that appropriate interventions can be devised to augment the former and minimize the latter.

Voluntary participation: Your participation in this study is purely voluntary; you will be able to withdraw from this study at your will, without any repercussions.

Confidentiality: You can be assured that all the information you will provide in this study will be kept confidential, it will neither be shared with the local administration of this village or the district task force unless you identifying information is concealed.

APPENDIX B: QUESTIONNAIRE

SECTION A: SOCIO DEMOGRAPHIC CHARACTERISTICS

Number	Question	Multiple choice	Code of choice
1	Gender of patient	1. Female 2. Male	
2	Age of patient	
3	What is your marital status?	1. Single 2. Married 3. Cohabiting 4. Other	
4	To what religious denomination do you belong?	1. Catholic 2. Anglican 3. Muslim 4. SDA 5. Born again 6. Other.....	
5	Did you receive formal education	1. Yes 2. No	
6	If yes to what level?	1. Primary 2. Secondary 3. Post-secondary	
7	Are you currently employed?	3. Yes 4. No	

SECTION B: ENROLLMENT INTO CBHI

Number	Question	Multiple choice	Code of choice

8	Are you currently a member of the CBHI for diabetic patients at this facility?	1. Yes 2. No	
9	If yes, for how long have you been a member?	1. Less than 2 years 2. More than 2 years	
10	If no, do you plan to join the CBHI in the near future?	1. Yes 2. No	
11	If yes in how long?	1. Less than a year 2. More than a year	

SECTION C: INTRAPERSONAL CHARACTERISTICS

Number	Question	Multiple choice	Code of choice
12	Are you aware of the CBHI for diabetic patients available at this facility?	1. Yes 2. No	
13	What is the main function of the CBHI for diabetic patients?	1. Provide a psychosocial support for diabetic patients 2. Provide medical cover to diabetic patients whenever they need it 3. Collect money from patients, in form of saving 4. It is like a SACCO	
14	My blood glucose levels are well controlled	1. Strongly agree	

		<ul style="list-style-type: none"> 2. Agree 3. Disagree 4. Strongly disagree 	
15	How would you generally rate your health status	<ul style="list-style-type: none"> 1. Am very healthy 2. Somewhat healthy 3. Sickly 	
16	What type of diabetes were you diagnosed with?	<ul style="list-style-type: none"> 1. Type 1 2. Type 2 	
17	How long has it been since you were diagnosed with diabetes	<ul style="list-style-type: none"> 1. Less than 5 years 2. More than five years 	
18	Have you ever missed a dose of your medication because you couldn't but them?	<ul style="list-style-type: none"> 1. Yes 2. No 	
19	Have you every suffered from any complications of uncontrolled diabetes (chronic hyperglycemia)	<ul style="list-style-type: none"> 1. Yes 2. No 	
20	What type of medication have you been prescribed for diabetes management?	<ul style="list-style-type: none"> 1. Oral medication 2. Injectable Insulin 	

SECTION C: HEALTH CARE SERVICE RELATED CHARACTERISTICS

Number	Question	Multiple choice	Code of choice
21	How would you rate the level of accessibility to healthcare facilities in this area	<ul style="list-style-type: none"> 1. Very easy 2. Easy 3. Difficult 	
22	For how long do you have to travel in order to reach a health facility in this area?	<ul style="list-style-type: none"> 1. Less than 30 minutes 2. More than 30 	

		minutes	
23	How far is the nearest diabetes care and treatment providing facility from your home?	1. Less than 1 km 2. More than 1km	
24	Is diabetes medication always available at this health facility?	1. Yes 2. No	
25	Have you ever sought a refill of diabetes medication and told that they were out of stock?	1. Yes 2. No	
26	For how long does one have to wait for diabetes related healthcare services at this facility	1. Less than 30 minutes 2. More than 30 minutes	
27	Are insured diabetic patients favored more when it comes to receiving healthcare at this facility?	1. Yes 2. No	
28	What is the level of facility that you receive diabetes related care and treatment from?	1. Yes 2. No	

SECTION D: SCHEME RELATED CHARACTERISTICS

Number	Question	Multiple choice	Code of choice
29	The amount of premium charged by the CBHI is affordable by any diabetic patient	1. Strongly agree 2. Agree 3. Undecided 4. Disagree 5. Strongly Disagree	
30	The benefits package provided by the CBHI for diabetic patients is sufficient enough to cater for healthcare needs of any diabetic	1. Strongly agree 2. Agree 3. Undecided	

	patient insured	4. Disagree 5. Strongly Disagree	
31	The administrators of the CBHI for diabetics at this facility always sensitize diabetic patients to enroll into the insurance scheme?	1. Strongly agree 2. Agree 1. Undecided 2. Disagree 3. Strongly Disagree	
32	The CBHI scheme for diabetic patients at this facility is integrated into the local government structures of the district	1. Strongly agree 2. Agree 3. Undecided 4. Disagree 5. Strongly Disagree	
33	The CBHI scheme for diabetic patients at this facility is integrated into the administrative structures of the facility?	3. Strongly agree 4. Agree 4. Undecided 5. Disagree 6. Strongly Disagree	
34	The administration of the CBHI is very accountable?	1. Strongly agree 2. Agree 3. Undecided 4. Disagree 5. Strongly Disagree	
35	The administration of the CBHI is very transparent?	1. Strongly agree 2. Agree 3. Undecided 4. Disagree 5. Strongly Disagree	
36	The CBHI only covers diabetic patients and not their relatives or family?	1. Strongly agree 2. Agree	

		<ul style="list-style-type: none"> 3. Undecided 4. Disagree 5. Strongly Disagree 	
37	Registration into the CBHI for diabetics is very bureaucratic?	<ul style="list-style-type: none"> 1. Strongly agree 2. Agree 3. Undecided 4. Disagree 5. Strongly Disagree 	
38	I trust the insurance scheme for diabetics	<ul style="list-style-type: none"> 1. Strongly agree 2. Agree 3. Undecided 4. Disagree 5. Strongly Disagree 	

END

APPENDIX C: LETTERS (CIU)



(+256) 0312 307400
rec@ciu.ac.ug
www.rec.ciu.ac.ug

21/03/2022

To: Sarah Komugisha

Clarke International University
+25678528449

Type: Initial Review

Re: CLARKE-2021-320: “PREDICTORS OF ENROLLMENT INTO COMMUNITY BASED HEALTH INSURANCE SCHEMES AMONG PATIENTS WITH DIABETES MELLITUS IN WAKISO DISTRICT – CENTRAL UGANDA, ,

I am pleased to inform you that at the **27th** convened meeting on **21/03/2022**, the Clarke International University REC, committee meeting, etc voted to approve the above referenced application. Approval of the research is for the period of **21/03/2022** to **21/03/2023**.

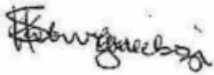
As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **21/03/2023** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Clarke International University REC:

No.	Document Title	Language	Version Number	Version Date
1	A clean copy of the proposal	English	2.0	2022-03-02
2	Informed Consent forms	Luganda	1.0	2022-01-24
3	Data collection tools	English	1.0	2022-01-24
4	Informed Consent forms	English	1.0	2022-01-24
5	Risk Management plan	English	1.0	2022-01-24
6	Data collection tools	Luganda	1.0	2022-01-24

Yours Sincerely



Samuel Kabwigu
For: Clarke International University REC

7th Feb 2022

.....
.....

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from Clarke International University (CIU) - Formerly International Health Sciences University (IHSU).

This is to introduce to you **Ms. Komugisha Sarah** Reg. No. 2019MPHWD –F03 a student of our university.

As part of the requirements for the award of a Master of Science in Public Health, the student is required to carry out field-based research for the submission of a Research Dissertation.

Sarah would like to carry out research on issues related to. **Predictors of enrollment into community-based health insurance schemes among patients with diabetes mellitus in Wakiso District – Central Uganda**

I therefore request you to render the student such assistance as may be necessary for the success of her research project.

I, and indeed the entire University Administration would like to thank you in advance for the assistance you will render to the student.

Sincerely yours,



Alege John Bosco
Senior Lecturer / Dean

#Make a Difference



Plot 1717 | Bukasa | Kyeyitabya
P.O. Box 7782 Kampala, Uganda

APPENDIX D: LETTER (WAKISO DISTRICT)



WAKISO DISTRICT LOCAL GOVERNMENT

OFFICE OF THE DISTRICT HEALTH OFFICER
P.O. Box 7218, Kampala Uganda,
Email: wakisodlo@yahoo.co.uk / Website: www.wakiso.go.ug



Med/218/019/2022

4th August 2022

The In Charge

- Wakiso Health Centre IV
- Kajjansi Health Centre IV
- Bulondo Health Centre III

PERMISSION TO CONDUCT RESEARCH BY MS. KOMUGISHA SARAH.

This is to introduce to you the above-mentioned student from Clarke International University who has requested for permission to conduct her study, using your facilities as her study sites, for her study titled **"Predictors of Enrolment into community-based health insurance schemes among patients with diabetes mellitus in Wakiso District."**

Permission has been granted to her to carry out the above research at your facility.

Kindly accord her necessary assistance.


Nabuganda Beta
ADHO-MCH, Wakiso


Cc. Chief Administrative Officer, Wakiso
Cc. Ms. Komugisha Sarah, Student