SOCIO-ECONOMIC DETERMINANTS OF BLOOD DONATION IN TANZANIA

A CASE OF MOROGORO MUNICIPALITY

SOCIO-ECONOMIC DETERMINANTS OFBLOOD DONATION IN TANZANIA
A CASE OF MOROGORO MUNICIPALITY

By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Project Planning and Management (MSc PPM) of Mzumbe University

2017

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled "***Socio-Economic Determinants of Blood Donation: A Case of Morogoro Municipality***", in partial/fulfillment of the requirements for award of the degree of Masters of Science in Project Planning and Management of Mzumbe University.

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DECLARATION

I, Ernest Lawrence Mramba, declare that this dissertation is my original work and that it had not been presented and will not be presented to any other university for a similar or any other degree award.

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Last but not least, I would like to thank all those who contributed to this study in one way or another. Their contributions are sincerely appreciated. However, the mistakes that may be found in this work remain to be mine.

DEDICATION

This work is dedicated to my lovely parents for their moral and financial support that has culminated to attain the level of education I have now. Their support is very much appreciated.

I would also like to dedicate this work to my loving wife and daughter for their patience during the whole process of this work. Their patience has never been in vain.

LIST OF ABBREVIATIONS

AIDS	-	Acquired Immunodeficiency Syndrome
GoT	-	Government of Tanzania
HBV	-	Hepatitis B Virus
HCV	-	Hepatitis C Virus
HDI	-	Human Development Index
HIV	-	Human Immunodeficiency Virus
NBTS	-	National Blood Transfusion Service
RC	-	Roman Catholic
RHO	-	Region health Office Morogoro
SPSS	-	Statistical Package for Social Sciences
USD	-	United States Dollars
USP	-	Universidade de São Paulo
WHO	-	World Health Organization

ABSTRACT

The main purpose of this study was to investigate the effect of socio-economic determinants on blood donation in Tanzania, a case of Morogoro Municipality. The specific objectives were (i) to determine the effect of social factors on blood donation, specifically age, sex, level of education, health status, cultural beliefs, religious beliefs, fear for HIV test results and social network at community level and (ii) to examine the effect of economic factors on blood donation specifically income level, employment status, and health insurance. The study involved a sample of 128 respondents. The descriptive findings on blood donation found that, only 33 (26%) of out of 128 respondents had donated blood while 95(74%) out of 128 had never donated blood in their life. The logistic regression results showed sex (i.e. male), level of education (i.e. higher level of education) and religious beliefs (i.e. religious commitments) were positively related with blood donation at 1%, 10%, 10% level, respectively, with p values of 0.007, 0.077, 0.094 as theory suggested. Health status (. i.e. high sickness frequency), cultural beliefs (. i.e. cultural restrictions), fear for HIV test results, and health insurance (i.e. insured) were negatively related with blood donation at 1%, 5%, 10%, 1% level with p values of 0.000, 0.011, 0.070, 0.012, respectively, as per assumption. However, age, strong social network at community level, employment status, and level of income were not significant factors. Conclusively, blood donation was largely determined by sex, level of education, health status, cultural beliefs, religious beliefs, fear for HIV test results and health insurance. To increase blood donation, females must be encouraged, emphasis on education, eradication of the myths and misconception about blood donation, partnerships between national blood transfusion and religious bodies, need for more community's awareness about blood donation so as to alleviate unfounded fear (i.e. fear for HIV test results), need of improving health status of the people and donor recruitments programs strategies must be improved.

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CHAPTER ONE

BACKGROUND AND PROBLEM STATEMENT

1.1 Background information

Blood is lifesaving medicine for critically ill patients. Blood donations save many lives in the world. As such, blood is very important for vitality of humans and a sustainable economy. It is very critical to maintain safety of donor and recipient. The donor selection is the most important criterion of blood donation to patient so that to match blood group. The progressively raised of blood demand by 5% for health services imply that hospitals depend on a constant supply of blood (Ferguson, 1996). In 2006, blood requirement worldwide was estimated to be 8 million units, however only 3.2 million units were collected which is 41.5 percent of the world demand of the blood. For example, South-East Asia needs 25% of world blood yearly while it collects only 9 percent of world's blood supply. WHO (2009) revealed that, world's blood supply stands at 7 million units per year which remained below to an estimated 15 million units per year required worldwide. Generally, over 81 million donations of blood are collected annually but only 45% of these are donated in developed and transitional countries.

Blood donation in Africa is very low which can lead to a shaky economy. About 5 per 1000 people donate if compared to 47 per 1000 people in developed countries (Bates *et al.* 2008). WHO (2010) indicated that 35 countries in Africa collected less than half of the blood needed to meet the transfusion requirement of the population in given countries. A survey by Alex (2010) revealed that severe anemia occurs more frequently in Africa than other part of the world. This is contributed by a high number of patients with pregnancy-related complications such as malaria, sickle cell, worm infestation and malnutrition disease. For example, an estimated 287,000 women per year die worldwide from complications related to pregnancy and childbirth (WHO, 2009). Out of all these

maternal deaths from severe bleeding in sub-Saharan Africa, an estimated 26% are directly related to a lack of an emergency supply of blood. More than half of maternal deaths equivalent to 56% occur in sub-Saharan Africa with severe bleeding. On other hand, road accidents and related incidents cause heavy injuries that lead blood bleeding which medically increase the demand of blood to offset the loss of blood through injury.

According to the MoH (2005), several economic steps were taken in response to the growing demand for blood in Tanzania. One of these steps was to make blood officially collected by Tanzania National Blood Transfusion Service (TNBTS). This led to the establishment of a sustainable nationally coordinated blood transfusion service with support of necessary policy, regulation and standards to guide blood collection. The strategy ensures the adequate availability of safe blood in the country. According to the same source, the GoT created a sustainable mechanism for allocating enough financial resources for smooth running of the Blood Transfusion Service. Moreover, efforts were made in recruiting adequate personnel. On other hand, human resource is being strengthened through training to meet specific requirements of the NBTS activities. Other effort was launching of extensive awareness programs and promotion of recruitment and retention of healthy, voluntary, non-remunerated and regular blood donors so as to ensure adequate availability of safe blood (NBTS, 2013).

In addition to that, the GoT introduced an effective mechanism for maintaining quality, efficiency and effectiveness of the National Transfusion Service activities. For example, testing of donated blood includes screening for transfusion transmissible infections, blood group and compatibility testing of blood (NBTS, 2013). Not only that more efforts by the government towards this move were seen in encouraging appropriate clinical use of blood and blood products. Also, government promotes and encourages research in the field of transfusion medicine and related technology and established a legal framework for blood transfusion safety in Tanzania (MoH, 2005; NBTS, 2013).

1.2 Problem statement

Despite of all efforts and program to enhance availability of blood in Tanzania, the blood shortage has continued to exist, causing a lot of consequences to ill people, which could finally translate to a weak and unproductive population in the economy. Given the consequence of blood shortage, about 26% of inpatient deaths from maternal hemorrhage in the country are caused by non-availability of blood (Bates *et al.*, 2008). Currently, the statistics show that the national demand for blood stands at 400,000 to 450,000 units per year which is higher than the supply of blood which is 160,000 units per year countrywide (NBTS, 2013). This is equivalent to 38 percent of the annual blood needed to meet Tanzania's blood demand hence the continued persistent shortage of safe blood in the qualified health hospitals (Mauka *et al*, 2015).

The reasons for this shortage are not clear. But Alfouzan *et al.* (2014), Mauka *et al.* (2015), Nwogoh *et al*. (2015) Finck *et al.* (2016) and in their studies tried to highlight the major causes as fear, lack of knowledge, poor health and culture of potential donor. However, when it comes to fear, it was not well explained what kind of fear becomes an obstacle to blood donation because someone can fear the needle while another one fears to be discovered to have HIV positive. When it comes to culture, again, it was not clearly defined especially when it comes to religion and some unfounded beliefs since some religious are against blood transfusion, they could possibly discourage its donation. Besides that, the effect of income, wealth and insurance were completely not examined. People with better income, wealth or health insurance can think they are secure and so they do not need to volunteer for blood donation because when their turn comes, they can easily afford to buy some blood from the bank. Apart from that, these authors simply examined the factors without grouping them into social factors and economic factors to see which ones had stronger effects for policy to focus on. Thus, different from these studies, because of blood's importance to people's health statuses to contribute to a strong and stable economy. This study is examining such factors as age,

gender, level of education, employment, income, level of illness, cultural beliefs, religious and fear of being discovered with HIV, strong social network at community level and health insurance. And it groups them into social and economic factors to determine which group had more influence on blood donation.

1.3 Research Question

1.3.1 Main research question

What are the socio-economic determinants of blood donation in Tanzania?

1.3.2 Specific research questions

i. What are the effect of social factors on blood donation?
ii. What are the effect of economic factors on blood donations?

1.4 Objectives of the Study

1.4.1 General objective

The general objective of the study was to investigate the effect of socioeconomic factors on blood donation in Tanzania.

1.4.2 Specific objectives

i. To determine the effect of social factors on blood donation.
ii. To examine the effect of economic factors on blood donation.

1.5 Scope of the study

The study intended to examine the socio-economic determinants for blood donation in Tanzania and Morogoro Municipal Council as a case study.

1.6 Significance of the Study

The importance of the finding of this study is the contribution of useful information for policy implication and decision makers in the efforts towards reduction of scarcity of

blood in the economy. As we agree blood donation plays a greater role in maintaining the labor force of the economy by saving life through blood transfusion therefore availability of blood is crucial for country development. Furthermore, availability of blood increases the life expectation, health status of the people which both of these are indicators of economic development of a country.

1.7 Organization of the report

This research report was organized into five chapters: Chapter one is about the introduction of a problem, statement of the problem, research questions, research objectives, scope, significance of the study, and organization of the report; chapter two was dealing with literature review providing the theoretical framework, empirical review and conceptual framework the study, chapter three which covered the research methodology. Chapter four included presentation of the findings and discussions. The last chapter five presented summary of the study, conclusion and policy implication of the findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical review

The chapter presents review of various studies with the sake of learning their contents relative to this study. The review mainly covers the definition of concepts, blood situation in Tanzania, blood situation in Africa, importance of blood, theories related to the study and finally the empirical studies.

2.1.1 Definition of terms

2.1.1.1 Blood

Blood is defined as a reddish fluid found inside the living body that contains red and white blood cells, proteins, platelets, and other components (Burdine, 2013). It is transported throughout the body by the circulatory system. For humans' blood is greatly important as it helps to save the life of those who happen to have some deficiencies in blood contents. Blood is mostly needed by patients who are wounded in accidents, organ transplant, heart surgery, organ transplant, patient receiving treatment for leukemia and other illnesses, such as sickle-cell anemia and Thalassemia (Shenga et al., 2009; Pathak, 2010). Besides these groups, the ageing population and pregnant women do greatly have demand for blood sometimes. Therefore, there is an extreme need for assuring a constant supply of blood. Finally, blood donation is therefore, very crucial for facilitating the entire process of blood transfusion.

2.1.1.2 Blood donation

According to Olaiya & Olatunji (2004) defined that blood donation is the process of giving of some of your blood to be used by another person for medical, while blood transfusion is a procedure in which blood is taken from one individual and put into

another individual´s body, particularly after an accident or during medical or operation purposes. Blood donation can be categorized into three, which are non-remunerated or unpaid blood donation, commercial or paid blood donation and a family replacement donation. The unpaid donation of blood involves free will giving of blood with no search for payment either in cash or in kind, which could be a substitute for money (Tagny, 2011). When blood donation involves a family member or community member, the action is family replacement donation. Paid or commercial blood donation is an act of which a person donate blood and get paid afterwards by the recipient (Tagny, 2011; WHO, 2011). However, paid or commercial blood donation is strictly prohibited by world health organization (WHO and International Federation of Red Cross and Red Crescent Societies, 2010). In the entire process a person who donates blood to another person in need or to the blood banks for the sake of constant blood supply is referred to as the blood donor, whereas the one who receives blood is called blood receipt (Lai et al., 2003).

2.2.1 Blood situation in worldwide

Worldwide statistics from 177 countries showed that approximately 21 million liters of plasma and 82 million units of blood were donated in the period of 2002- 2003 annually; whereas 62% of the blood supply in global was donated in developed countries. Only 38% were donated in least developing countries where 82% of the world population lives. Differences at blood donation frequencies mostly replicate differences in the level of development of health care systems in these countries (WHO, 2004).

The demand for safe and sufficient blood supply is a global problem. In countries with more advanced health care systems, blood and blood products are predominantly used to sustain developed medical and trauma care, clinical processes and the treatment of patients with conditions such as hematological disorders and leukemia (Geofrey, 2006). The strategy of blood usage is varied in countries where facilities and treatment options

are more limited, with a greater percentage of transfusions being suggested for treatment of unforeseen complications during pregnancy and giving birth, severe childhood anemia and shock. An Approximately more than half a million women die each year from difficulties associated to pregnancy and childbirth in the global, 99% of them in least developing countries (LDC's). In developing countries, maternal conditions are the third primary reason of deaths among women between 16 and 45 years. Heavy breeding during giving birth is responsible for 25% of these deaths. Malaria, a main cause of a life-threatening deficiency of red blood cells (i.e. anemia), is one of the leading courses of death among small children aged 0-4 with 8% of all deaths in that age group and up to 71% of all blood transfusions in third world countries are given to children with severe blood deficiency. Worldwide, road traffic accidents injuries are second foremost cause of death for people aged 6-30. The transfusion of blood is often essential to the management of all the circumstances (Jacobs and Berege, 1995; WHO, 2004a; 2004b).

2.2.2 Blood donation in Africa

Attainability of sufficient blood supply remains a serious problem of concern, particularly in African countries where 84% of the global population lives. Surprising, only 40% of the global blood supply comes from there (WHO, 2004). It was projected that by 2013, African blood transfusion services would achieve specific targets such as drafting and blood transfusion services in Africa should achieve specific objectives such as drafting and executing a national blood policy and collecting blood from more than 80% of volunteering unpaid donors (Tagny, Owusu-Ofori, Mbanya, & Deneys, 2010). Knowledge of the sociologic characteristics of the blood donor is crucial to ensuring adequate blood supply in Africa and several studies have been carried out in various African countries to determine these characteristics. Some noted that in Sub-Saharan Africa, the blood donor was more often a family or replacement donor and accounted for over 69.6% blood donor populations usually (Tagny et al., 2010). Most blood donors

were found under 30 years of age (Cunha *et al.,* 2007) and more than 70% of the donors were male. There are very few studies that have investigated the factors that affect blood donation and cultural perceptions in African; Among the few includes Olaiya *et al*. (2004) in west Africa (.i.e. Nigeria) and (Agbovi *et al*., 2006). These studies showed that people who donated blood had fear for unknown: such as fear of being infected with diseases, fear for knowing one's HIV test status and myths which purport blood donation can cause high blood pressure, weight loss and death. Several African countries implemented programs to counter these fears and one Ghanaian study showed that by providing a good environment that acclimates to the local cultural beliefs is effective not only in recruitment of people to donate blood but also retaining repeated donations (Allain *et al*., 2003). Another study from Senegal found that the main motivation determinants for blood donation were altruism (43%), awareness of scarcity of blood (20.3%) and never having been asked to give by any one was the first obstacle for donating blood (37.3%) (Duboz *et al.,* 2010). Most sub-Saharan countries have not reached their blood reserve targets hence more efforts are needed.

2.2.3 Blood donation situation in Tanzania

Similarly, to other least developed countries in Africa, Tanzania has a very ineffective and bureaucratic blood donation system. Mainly it has based in hospital blood transfusions services, however it had executed a national blood policy and constituted a national blood service, which it was initiated at early 2006 by the MoH. It is mainly a hospital based blood transfusion services, but it had implemented a national policy and established a national blood services, which started early 2006 by the MoH. But a NBTAC was formed in 1991 which established a general National Guidelines for Safe Blood Transfusion (NGSBT) covering all aspects from Transfusion to collection of blood (MoH, 2005). Moreover, approval strategies for the prescription of blood transfusion commenced in 1991 (Gumodoka *et al*., 1993). By the end of 1989 screening

for HIV antibodies among donors was official introduced and implemented country wide (Lyamuya *et al*., 1996).

In the years of 2000, most of the blood donated were for family replacement and only very few were for voluntary donation 80% versus 20% respectively, HIV screening was compulsory, inadequate information was available about diagnosis of HBV/HCV/Syphilis and other transfusion communicable diseases. In nutshell, like several African countries, blood usage guidelines were neither available nor applied in many hospitals (WHO, 2004).

2.2.4 Beliefs towards blood donation

In generally most people misjudge health risks, and there is now a growing body of indication showing that individuals also perceive both blood donation and transfusion as risky (Lowe and Ferguson, 1996; Farrell et al., 2002). The investigation of peoples' beliefs is crucial for better understanding on the individual blood donation behaviors like why one donate blood and the other do not. In Mwanza, Tanzania, studies on local beliefs and altitudes among people towards blood donation concluded that many donors to be infected with HIV or getting sickness while donating blood (Jacobs and Berege, 1995).

In Nigeria, the highest populated country in Africa, though most of them are educated but they believe HIV is spread by blood donation. 50% of people who had donated blood wished to know their status of HIV and hepatitis. A lot of people are scared of what they concern as side effects, such as feeling dizziness, sudden death, weight loss, sexual failure, high blood pressure and seizures. Other do not like to donate blood due to religious and cultural beliefs (Olaiya et al., 2004). In Tanzania, special efforts must be enacted to increase public awareness of the difference between blood donation and transfusions. Also, reduction of misconceptions of risk of getting HIV and fear for being

isolated by the community if your diagnosed with HIV positive therefore this tender to deter donors (Bingi, 2002). Also, misconceptions about the effects of blood donation are widespread, even among educated persons worldwide. Many wrong myths are found in African countries. Traditional Chinese cultural belief harbor strong misconceptions amplifying the destructive effect of blood donation.

2.2.5 Reasons for not donating blood

In most developing countries, various studies have revealed alike reasons for donating blood. For example; in a study conducted out in China, it concluded that pushing factors for blood donation were such as social network, checking one's health status and altruism (Zaller et al., 2005). Altruism seems key factor for blood donation among many African countries (Hosain et al., 1997). Singh et al. (2005) found that professionals, literates, older people and male were more likely to donate blood relative to non-professionals, illiterates, and women, with men deemed more likely to voluntarily donate blood compared to women due to masculinity nature in India. In Thailand, different studies have found that the major reasons for donating blood religious beliefs and social services (Wiwanitkit, 2002). For the case of East African countries like Tanzania, people donated blood due to family replacement, few voluntarily donated, and some donated blood for money (Bingi, 2002). Moreover, in West Africa particularly in Nigeria, more people donated blood due to some benefits such as antenatal registration they obtained from health centers and saving lives of their relations (Olaiya et al., 2004).

2.2.6 Importance's of blood donation

The importance of blood to human life is non-comparable because no factory can manufacture blood albeit recent advancement in medical technology. Human blood is only made by human body and circulated. Therefore, it is only through blood transfusion that human beings can save their fellows who need blood for their medical reasons.

Shortage of blood may cost human life. Hence, blood storage is very important for its prompt availability in times of emergency like accidents, medical operations, and pregnancy complications (Neken, 2005). The shelf life of blood is only 21 days, thus posing a potential blood shortage if people do not donate blood frequently.

2.2.7 Theory related to the study

Different theories could be used to explain the relationships between determinants for blood donation. In this study, the social capital theory, public good model and Motivation theory were used to explain the independent variables and their relationship to the dependent variable.

2.2.7.1 The Social Capital theory

Building from social capital that Bourdieu (1986) conceives as the aggregate of the actual potential resources linked to possession of a durable network of more of less institutionalized relationships of mutual acquaintance or recognition'. The social capital theory therefore provident from the need to enjoy the profit made in the society through the networking of actors. According to Gillespie & Hillyer (2002), the social capital theory is among the widespread theories used to explain donor behavior. In keeping with the preference toward voluntary, public, nonprofit, low cost blood system donors draw greatly from the concepts of social capital and public goods. The donation of blood is a result of the perceived benefits of the blood as resource shared among people in need in the locality. Donors feel it is part of their personal norms and responsibility to volunteer for blood donation so as to contribute for the betterment of the entire society. The push here derives from the feeling of togetherness, concern and relatively the sense of solidarity because the donated blood will be of use even for the individual or his or her intimate in case of need. Donors therefore build a conviction that that it is within their responsibility to donate blood the saving the human lives. Most of the social factors attributed to affect blood donation functions in response to this theory. The social factors

such as the question of age, individual tend to donate blood in their youth age so as to contribute for young and old people of their society.

2.2.7.2 Public goods model

The public goods are conceived to be goods that cannot be supplied by the market as or if supplied will not be in sufficient quantity. On the other side, these goods once supplied could not be limited to some only as every individual could profit from the benefits of the good (Stiglitz, 2002). The model is likely to be applied to account for the potential donor's behaviors as the blood bank once harvested from the donors, it could be transfused to any of the individual recipient regardless of whether the person had ever donated blood or not. Likewise, human blood being a product that can only be gotten from the donor and no industry up to this moment can make and supplying blood, the government should intervene to make sure that the supply of blood is maintained. One of the means to ensure the supply of blood is to encourage her citizens across the country to donate voluntary and not just enjoy the free rider provision of blood.

2.2.7.3 The motivation theory

To draw the attention of the individual to donate blood motivational strategies are said to be core aspects. The motivation theories propound that individual's actions are products of some stimuli that prompt a person to respond to it either positively or negatively. With regard to blood donation there are several factors that could promote blood donation but mainly categorized into altruism and incentive perspectives (Titmus, 1971; Glynn *et al*., 1997; Wiwanitkit, 2002; Bingi, 2002). The Altruism perspective contends that donor volunteer to donate blood for their personal prestige in the society. Gillespie & Hillyer (2000) defined altruism as a "pro social behavior that had no obvious benefit for the respondent but is beneficial to the recipient. It is argued that donor do voluntarily donate blood if they perceive that it responds to their inner conviction of humanitarian

responsibility to be charitable and good citizens. These convictions are embedded in other factors such as religious belief and cultural ties. While in some cases though, the question of blood donation is strictly forbidden in as far as religious and cultural precepts are concerned, there are a number of religious beliefs that encourages their people to be charitable, and be ready to offer their blood for the needy. Apart from the sense of duty or altruism being the motivating factor, different incentives are also accounted for push or pull factors towards blood donation. The level of knowledge, income, and other benefits such as insurance identity cards and mass counseling are accounted as positive factors that culminates blood donation. Schreiber et al. (2003) examined including other factors implicated in donor motivation in developed countries are community needs and support, family assurance, blood credits and social pressures. However, the study did not consider other factors such as fear from pain, deferral medication, and other misleading conceptions regarding blood donation.

2.3 Empirical literature review

Mauka, Mahande, Msuya, & Philemon (2015) examined factors related to repeat blood donation in northern Tanzania found that, repeat blood donation was affected *inter alia* by closeness of donating site, blood donation interval, willingness to donate blood and personal blood donation behaviour. The study recommended that sustaining education on blood donation among health staff in particular and society in general is a prime motivating factor for repeat blood donation. However, the study did not consider other important variables like cultural beliefs, religious, fear HIV test, and employment among others that might be driving factors for repeat blood donation.

Csákvári et al. (2016) assessed undergraduates' habits of blood donation found that 54% of respondents never donated blood, 17% of the respondents gave blood once, and 28% did it regularly. The main reason for not donating blood was the fear of the process, while motivating factors for donating blood were recognition and the need to help others. However, the study is limited in scope and content because it was conducted in Hungary and findings could not be replicated to Tanzania's situation particularly in Morogoro Municipality. Moreover, the study left out other important variables that might be limiting or motivating factors to blood donation.

Melku et al. (2016) conducted a study to assess the knowledge, attitude, and practice of adult population towards blood donation in Gondar town, Ethiopia. The study found that knowledge, good attitude, and experience were important factors of blood donation. Furthermore, some variables like age, health status and religion significantly affected blood donation in Ethiopia. However, this study did not consider health insurance, income, and social network at the community level. The study, albeit having important variables, it is limited in scope as it was conducted in Ethiopia. Thus, its findings could be replicated to suit the situation of Tanzania.

Pule, Rachaba, Magafu, & Habte (2014) conducted a study in South-East Botswana to determine the level of intention of the general people towards donating blood. A study had a sample of 384 participants. The cross-sectional data was collected using interviewer-administered questionnaire. The data was analyzed using combination of descriptive and logistic regression. Major finding of study indicated that 104 (27.1%) respondents had donated blood in the past and 269 (70.1%) respondents revealed that they would donate blood. Moreover, the analysis of logistic regression results indicated that education was an important determining blood donation. The secondary school and awareness about a family member who had donated blood before. They concluded that

there is an association of education system and intention to donate blood. The study also revealed that awareness about family planning increased the willingness to donate blood. The present study examined the socio-economic determinants of blood donation in Tanzania.

Precisely, Zangiacomi *et al*. (2014) conducted an investigation to examined the relationship between blood donation behavior and religiousness among university students' in Universidade, Brazil. Using samples of 227 students with ages ranging 21 to 55 years. Their study found that, only 24% of the student were regular blood donors. Furthermore, they found that religiousness was linked with altitudes towards blood donation. This also indicates evidence that people who donate blood have higher intrinsic religiousness than those who never donated or donated only once.

Amatya (2013) also conducted a study on how knowledge, attitude and practice of blood donation among students of different colleges of Kathmandu, Nepal. It was a cross-sectional study conducted on 177 students of donor eligible age from different colleges of Kathmandu. The self-administered structured questionnaire was used to collect data. The mean age of students was 20.46 years, girls comprised 58.8%. Eighteen percent students had donated before; 31.5% of boys and 8.7% of girls had donated. Average knowledge was about (32.4%). Practice of blood donation had male propensity and positive correlation with knowledge.

Abderrahman & Saleh (2013) investigated the effects of knowledge and attitudes of blood donors and barriers about blood donation in Jordan. Using a cross-sectional data from 500 blood donors the finding shows that inadequate knowledge about blood donation was found as only 28.6% of participants scored their knowledge above the average. Other findings with mentioning includes friends, encouraging media, and

religion were influential factors affecting their knowledge and attitudes related to blood donation.

On a similar study conducted in Nigeria, Olaiya et al. (2004) found that fears, misconceptions and religious reasons were important factors contributing to inadequate availability of blood. Also, in the same study found that females constitute only 1% of the donor population, because of myths that women are a weaker sex and do not have enough blood to donate.

Renzaho & Polonsky (2012) conducted a study to examine correlation and their effects between demographic and socio-economic factors of blood donation among African migrants in Australia. Using a cross-sectional data from 425 African migrants and refugees living in Victoria and South Australia. The study indicated that, religion, pre-migration area of residence, country of birth, length of stay in Australia, and previous blood donation status were main determinants of blood donation. While age, gender, educational attainment, migration and employment status were insignificant.

Merav & Lena (2011) examined factors affecting blood donation in Israelis. Using samples of 190. The results were, perceived behavior control of their blood donations, subjective norms and intention to donate blood were important factors influencing blood donation. Moreover, the finding shows that members of the Ethiopian Jewish community displayed an extremely limited intention to donate blood.

Charbonneau, Cloutier & Carrier (2016) conducted a study focusing on lapsed blood donors and/or no donors. They analyzed obstacles pertaining to blood donation and found that the fear for needles, inconveniencies in medical reasons, negligence, lifestyle, lack of marketing communication, lack of knowledge and some negative experience after first donation to be some barriers to the practice of blood donation. Moreover, with

regard to the gender the study found that, women were found to be more reluctant to blood donation as compared to men.

Focusing on social and cultural factors of blood donation, Umeora, Onuh, & Umeora (2005) found that witchcraft, not being strong, libido/loss of manhood, not having enough blood and lack of HIV/AIDS awareness, ignorance, misconceptions and misinformation concerning effects and safety of blood donation were main deterrents of blood donation in Nigeria.

Karacan, Cengiz Seval, Aktan, Ayli, & Palabiyikoglu (2013) conducted a study of factors impacting blood donation decision in Turkey. They used a cross section design and they had a sample of 189 respondents. They found that the regressions results indicated that only social responsibility had a positive significant effect on independent of age, level education and income. They concluded that blood donation decision is not only associated with altruistic motives but also self-regarding motives too.

Finck, Ziman, Hoffman, Phan-Tang, & Yuan (2016) conducted a study on understanding of the motivating and potential deterrents factors of blood donation in high schools in USA. They found that altruistic, prosocial empathetic, beliefs and thoughts as the motivating factors for donating blood. Whereas pain was the only utmost frequently chosen as deterrent factor for blood donation. Moreover, the study left out other important variables that might be limiting or motivating factors to blood donation.

2.4 Conceptual framework

Figure 2.1 presents the conceptual framework that provided a guide to the study in analysing the research questions. It provides the relationship of social and economic factors and blood donation. The social factors examined include age, gender, education, strong social network at community level, health status, cultural beliefs, religious

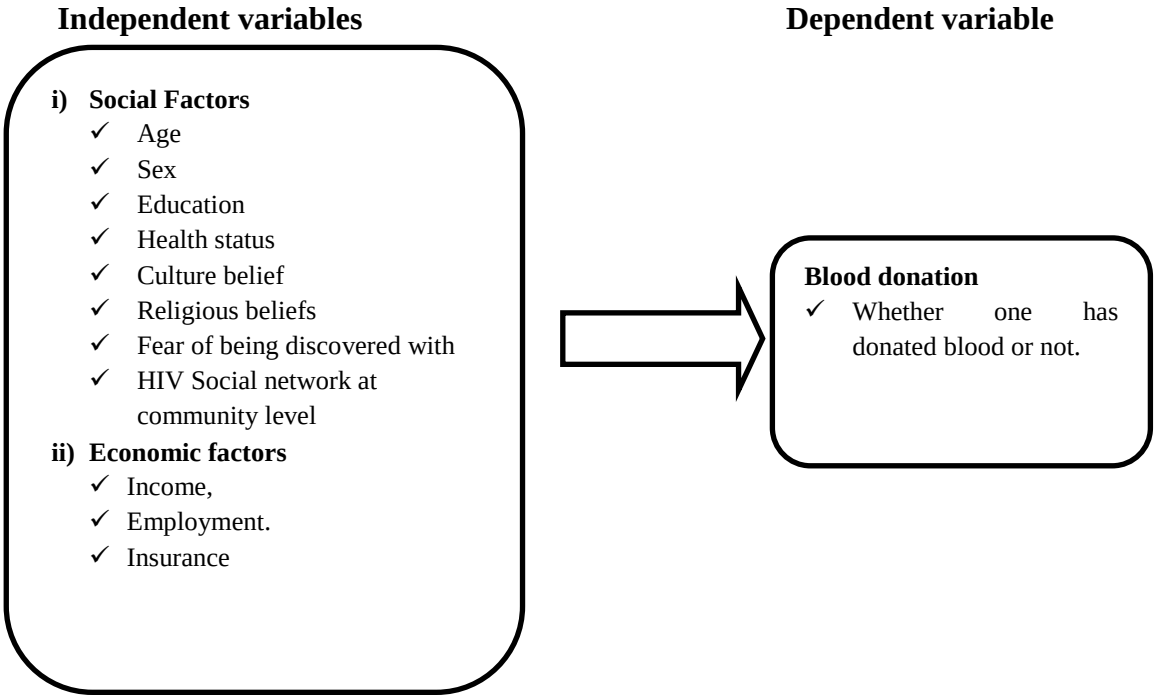
beliefs, fear of being discovered with HIV, and economic factors include employment, insurance and level of income. Starting with the effect of income, employment, and health insurance is completely not clear. People with better income, wealth, and health insurance can think they are secure and so do not need to volunteer for blood donation because when their turn comes, they can easily afford to buy some blood from the bank.

WHO (2015) thinks that, men donate blood more than women globally. This was backed by two reasons: first, women are not eligible to donate blood while in menstruation period and secondly the women can't contribute blood to blood bank while in pregnancy. This made women to lag behind the men in blood donation. On other hand theoretically, age of blood donor is considered as an important factor. The eligible age for blood donation starts from 18 years up to an age less than 65 year. Being youth of little age may donate more blood. Some studies suggest that people of age donate more blood than people of high age. Possibly that people with high age are more risk or are often easily by disease than people of young age because of decreased immunity.

Education ought to play great role in motivating people to donate blood. However, that is not always the case. Sometimes, people with education are more reluctant to donate blood than people with less or no education. Education is not only the motivator for blood donation thus why people hesitate to donate blood. Culture and religion may hinder people to donate blood due to misinformation, ignorance and misconception of blood donation. Martinez *et al.* (2014) argued that religion influence people decision to donate blood. Moreover, people with ties to religion are expected to donate blood. Godin *et al.* (2007) claimed that medical unfitness, possibly that might only be subjectively perceived, negatively influences the willingness for potential donors to donate blood. This could be because of people who are medically unfitness are subjected to diseases and also others are disqualified from donating due to the uses of medications and illness. Strong social networks may actor as motivator to blood donation, since person with

strong relationship with community are expected to be blood donors. They thought that even when it comes to his/her personal's need of blood,

Figure 2.1: Conceptual framework of socioeconomic determinants for blood donation.



Source: Researcher's Model 2017

CHAPTER THREE

RESEARCH METHODOLOGY

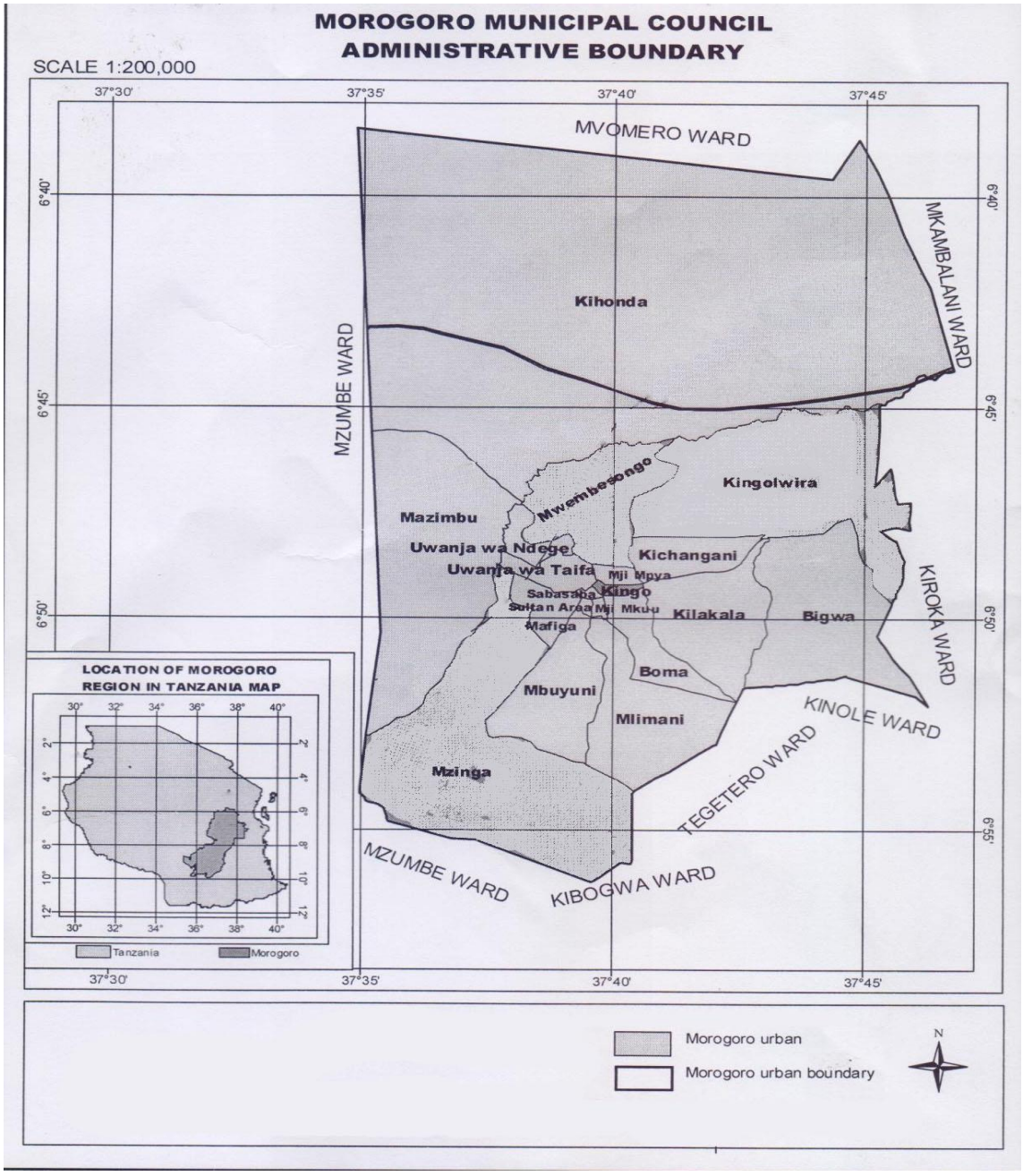
3.1 Research Design

Cross sectional research design was adopted by this study. Hence data was collected at once in a point of time. The main reasons for adopting this study design was that, the method required little resources such as money, manpower and time. The study design was adopted from a study of (Shenga et al., 2009).

3.2 Study Area

This study was conducted in Morogoro Municipality. It is one of the 9 councils in Morogoro region. It is approximately 195 kilometres to the West of Dar es Salaam and is located on the lower slopes of Uluguru Mountains whose peak is about 2640 meters (8634 feet) above sea level. Morogoro Municipality lies between latitude 4.49 south of Equator and longitude 37.0 east of_ Greenwich. It covers an area of 531 square kilometres and it is boarded by seven wards (Figure 3.1). Morogoro Municipality is a fast-growing business place due to fact that, it enjoying one peculiar benefit of being a hub whereby; there is a highway road link to East, West, South and Northern parts of the country and it is nearest to biggest city of Dar es Salaam. Therefore, the area was chosen because it was one of the regions with low level of voluntary blood donors due to fear of HIV test as it was documented in 1999/2004 RHO and also the researcher was familiar with the place and convenience because the researcher's relative lives there which easy resource availability for successful research Source: Study findings (2017) completion. Therefore, Morogoro Municipal Council was an ideal place for the study.

Figure 3.1: The map of Morogoro Municipality



Source: Morogoro Municipal Council (2017)

3.3 Target Populations and Units of analysis

The population for this study were the people living in Morogoro Municipality specifically from 6 wards namely Saba saba, Mji mkuu, Mazimbu, Mwembesongo, Kilakala and Boma Road. Also, the units of analysis were the people of Morogoro Municipal Council between the age of 18 to 65 years. The age range was taken because for one to be an illegible donor must have that age range (Njambi, 2012).

3.5 Sample size

The study used a sample size of 128 people, which was determined by the Slovin's formula, which was as follows:

$$\eta = \frac{N}{N \times d^2 + 1}$$

Where; η = number of sample size

N = sampling frame/ Total number of population

d = error margin = 0.09 (9%)

$$\eta = \frac{15955}{15955 \times 0.09^2 + 1} \approx 128$$

Lemeshow and Sturdivant (2013) recommend a minimum sample size of 10 observations per independent variable in the model, nevertheless caution that 20 observations per variable should be sought if possible. All sample units were contacted. The study adopted Slovin's formula in calculating the number of respondents from a study of (Dhokhikah *et al.*, 2015).

Table 3.1: Sampling frame and sample size of Morogoro municipality

Number of wards	Streets	Estimated Population	Sampled Number	Percentage
SABA SABA WARD	Kikundi	134	1	0.8%
	Makongoro	74	1	0.5%
MJI MKUU	Boma	690	6	4.3%
	Mlapokolo	1064	9	6.7%
MAZIMBU	Msamvu B	2771	22	17.4%
	Modeko A	2409	19	15.1%
MWEMBESONGO	Saadan	1657	13	10.4%
	Mtawala	2134	17	13.4%
KILAKALA	Kilakala	1747	14	10.9%
	Bigwa sokoni	1069	9	6.7%
BOMA WARD	Nguzo	287	2	1.8%
	Madizini	1919	15	12.0%
TOTAL		**15955**	**128**	**100%**

Source: Household survey (2012)

3.6 Sampling Techniques

The study used a simple random probability sampling. A simple random probability sampling technique was used to choose respondents. This technique was opted because every individual in a population had equal chance to be chosen as representative sample. Moreover, simple random sampling technique was used to select wards and streets, whereby each ward and street was selected randomly from the map of Morogoro Municipality.

3.7 Types and source of data

The study used primary data in which it the researcher administered structured questionnaire as a tool for data collection and also secondary data was used in which it included all data obtained from the organization documented records, such as organizational reports, journals and government surveys. Secondary data was important to be used since statistical information and records might be of a particular use to answer

research questions and objectives. These data were obtained especially in documented form. The secondary source of data includes written documents related to the study, example, library, journals and articles on blood donation.

3.8 Data Collection Methods

The structured questionnaire which contained the closed ended questions was used. It was administered to respondents who were supposed to respond to all questions based on the study objectives. The study administered questionnaires to respondents whom were publics of Morogoro Municipality, they included close ended questions. This method was useful and each item of questionnaire developed addressed a specific objective and research question. The method involved reading various documents concerning blood donation. It includes the review of journals, manuals, books and other publications concerning blood donation.

3.9 Analytic Model

It captures the central ideas of social-economic determinants of blood donation in Tanzania. The relationship between these factors determines whether or not factors affect blood donation. A Logit model analyzed the relationship between a dependent variable which is in binary form and its outcome is between 1 and 0 (i.e. 1 if one has donated blood while 0 if one has not donated blood) and a set of independent variables. The Binary Logit model used a logistic cumulative distribution function to estimate probabilities as shown. The Logit function is presented as follows:

$$P=\frac{e^{\beta \times}}{1+e^{\beta \times}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textit{(i)}$$

$$1-P=1-\frac{e^{\beta \times}}{1+e^{\beta \times}}=\frac{1}{1+e^{\beta \times}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textit{(ii)}$$

Where, P is the probability of success or failure given *e* denotes the base of natural logarithms, *Xi* represents the *ith* independent variables; and represents the vector of parameters to be estimated.

$$Y = \beta_0 + \beta_i X_i + \varepsilon$$

Where Y= Blood donation (1 if one has donated, 0 if one has not donated blood)

X_i = set of independent variables (Factors)

ε = error term

From equation (ii) the study had analyzed this regression equation

$$Log(\frac{Y_i}{1-y_i}) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon$$

Where Y = Blood donation

X_1 = Age,

X_2 = Sex,

X_3 = Education,

X_5 = Health status,

X_6 = Culture beliefs,

X_7 = Religious beliefs,

X_8 = Strong social network at community level,

X_9 = Fear of being discovered with HIV.

X_{10} = Income,

X_{11} = Employment.

X_{12} = Health insurance

Ɛ = Error or disturbance term

Table 3.2: Variables and their measurements

MAIN VARIABLE	VARIABLE	MEASUREMENT AND CODING	SOURCE OF DATA
Dependent variable	Blood donation	Whether one has donated or not. • Coded as, 1= If donated, 0= If has not donated	respondents
Social factors	Age	Number of years in school	respondents
	Sex	1= Male, 0 = female	
	Education	Number of years in schooling	
	Health status	Frequency of sickness within the last three months	
	Cultural beliefs	Whether there are cultural beliefs that restrict blood donation services. • Coded as, 1= Yes, 0= No	
	Religious beliefs	Whether a person is religious committed or not. • Coded as, 1= Yes, 0 = No	
	Strong social network at community level	Whether someone has strong social network at community level • Coded as, 1= Yes, 0 = No	
	Fear of being discovered with HIV.	Whether one worries about HIV test results. • Coded as, 1= Yes, 0= No	
Economic factors	Income	The respondent income rate per month in Tanzania shilling.	respondents
	Employment	Employment status of a respondent. Coded as 1= Employed, 0= otherwise, 1= Self-Employed, 0= otherwise and 1= Unemployed, 0= otherwise	
	Health Insurance	Whether someone is insured or not • Coded as, 1= Yes, 0= No	

3.11 Data Processing and Analysis

Data was coded in SPSS template before analysis carried out and also management was done by cleaning and checked for accuracy. The SPSS was used for some analysis such as frequency, mean, percentage, Pie-chart and histogram. However, for complex analysis, Stata software was used to facilitate the analysis of logit model.

3.12 Validity

Pilot study was conducted to test the validity of data collection instruments particular questionnaires and the improvements were made after the pilot. Some questions were rephrased and leading questions were removed to make the questionnaire more understandable. Thus, the validity of the collected data was assured.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Introduction

The general objective of the study was to investigate the socio-economic determinants of blood donation in Tanzania. The specific objectives were; i) to determine the effect of social factors on blood donation, specifically age, sex, and level of education, health status, cultural beliefs, religious beliefs, fear for HIV test results and social network at community level; ii) to examine effect of economic factors on blood donation specifically income level, employment status, and health insurance. The organization of this chapter is as follows: it first presents the sample size and its characteristics. It is followed by a presentation of data on research questions and objectives; with priority of an overall picture of how research findings answer an overall objective of the study.

4.2 Sample Size and Characteristics of Respondents

The study comprised 128 respondents of whom, 75 (58.6%) were males and 53 (41.4%) females. The age of respondents varied from 18 to 60 years old with the largest group of (65) which translates to 50.8% are aged between 34 to 60 years and with the rest (63) equal to 49.2% aged between 18-33 years. Majority of respondents were married 70 (54.7%), 45(35.2%) were single, widowed and divorced were 9 (7%) and 4 (2.3%) respectively. Nearly all (70) respondents were Christians (54.7%), Muslims were 45(35.2%) and other religions were 9 (7%). Most of respondents (47), which translates to 36.7%, were employed; 27 (21.1%) were self-employed and 35 (27.3%) were unemployed. Majority of respondents i.e. 73 (57%), had university/college education; 27 (21%) had secondary education; 19 (14.8%) had primary education; and only 9 (7%) had no education. A good number of the respondents, i.e. 42 (32.8%), had an income of less than 320000 Tanzania shillings; 37 (28.3%) had an income that ranged Tshs 320001 to

567000 and the income of 49 (38.8%) them ranged Tshs 567001 to 2600000 per month. Table 4.1 presents these results.

Table 4.1: Summary of respondents' characteristics

Characteristics	Attributes	Frequency	Percent
Gender	Female	53	41.4%
	Male	75	58.6%
	Total	**128**	**100%**
Age	18-33	63	49.2%
	34-60	65	50.8%
	Total	**128**	**100%**
Marital status	Single	45	35.2%
	Married	70	54.7%
	Widowed	9	7%
	Divorced	4	3.1%
	Total	**128**	**100%**
Religion	Christian	47	35.2%
	Muslim	70	54.7%
	Other	11	7%
	Total	**128**	**100%**
Education	No education	9	7%
	Primary education	19	14.8%
	Secondary education	27	21.1%
	University education	73	57%
	Total	**128**	**100%**
Income level	≤320000 Tsh	42	32.8%
	320001-567000 Tsh	37	28.9%
	567001-260000 Tsh	49	38.3%
	Total	**128**	**100%**
Employment_status	Employed	47	36.7%
	Self employed	46	35.9%
	Unemployed	35	27.3%
	Total	**128**	**100%**

Source: Study findings (2017)

4.3 Descriptive findings

4.3.1 Findings on blood donation

Findings on blood donation are as follows: Out of the 128 respondents 56 (43.8%) were willing to donate blood while 72 (56.3%) were not willing (see Figure 4.1). On other hand, out of 56 respondents who were willing to donate blood, only 17 (30.3%) had donated blood at least once in their life time and 39(69.6%) had never donated blood before (see Figure 4.2). The findings indicated that many people were willing to donate and very few had donated before.

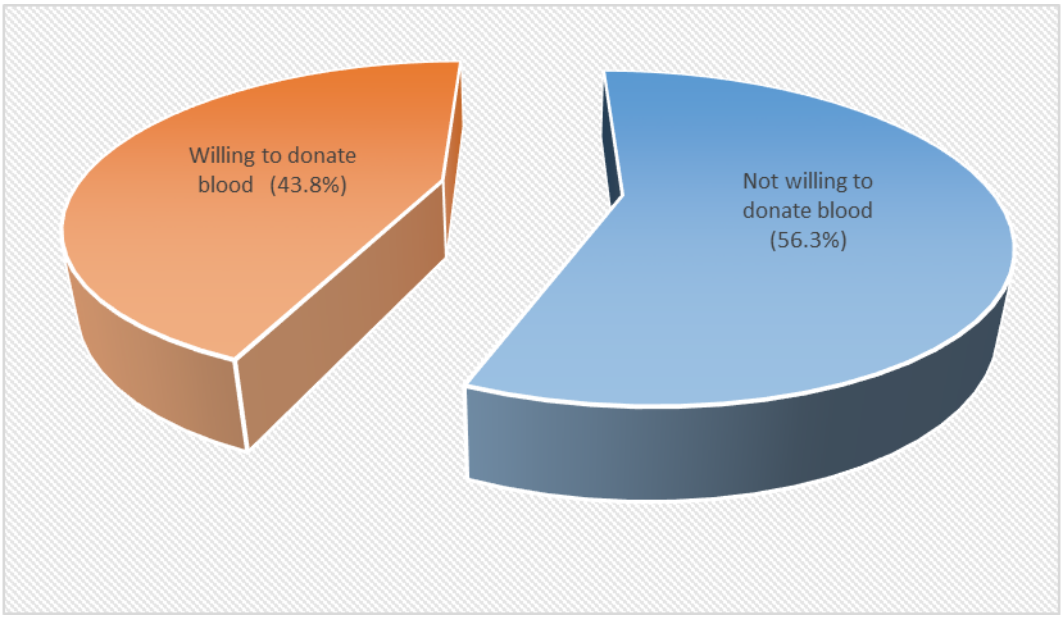
Table 4.1: Willingness to donate and blood donation level (N=128)

	Willingness to donate blood	Not willing to donate	Total
Donated	17	16*	**33**
Never donated	39	56	**95**
Total	**56**	**72**	**128**

*Donated at first, but not thereafter.

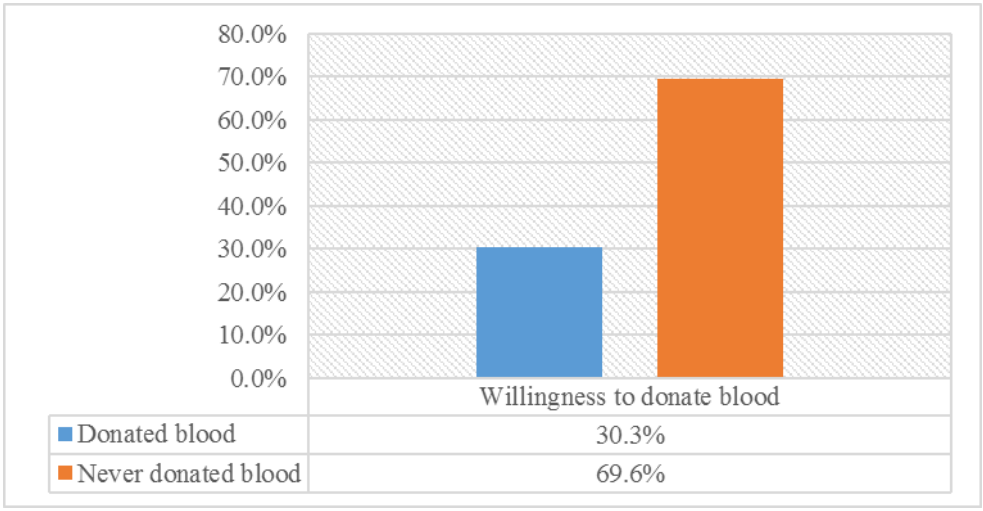
Source: Study findings (2017)

Figure 4.1: The willingness to donate blood (N=128)



Source: Study findings (2017)

Figure 4.2: The willingness to donate blood versus blood donation (n=56)

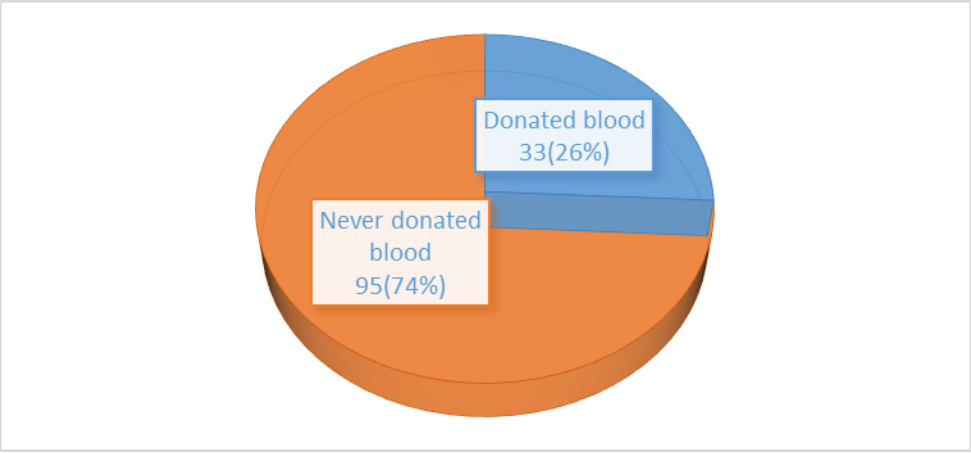


Source: Study findings (2017)

It was further of interest in this study to determine the number of respondents who actually donated blood and those who never donated. Results from Figure 4.3 illustrate

that, only 33(26%) of out of 128 had donated blood while 95(74%) never donated blood in their life, which is generally a very small number of people.

Figure 4.3: Findings on blood donation (N=128)



Source: Study findings (2017)

4.3.2 Socio-economic determinants affecting blood donation

There were two categories of blood donation determinants namely, the social and economic factors. The social factors include age, sex, level of education, health status, cultural beliefs, religious beliefs, fear of being discovered with HIV and social networks of the respondents. On other hand, economic factors include level of income, employment status and health insurance. Thus, there were 12 main factors included in the study as determinants affecting blood donation. In this section, a researcher present social factors first.

4.3.2.1 Social determinants affecting blood donation

Under this domain, the following variables were examined: age, sex, and level of education, health status, cultural beliefs, religious beliefs, fear of being discovered with HIV and social networks of the respondents.

4.3.2.1.1 Sex versus blood donation

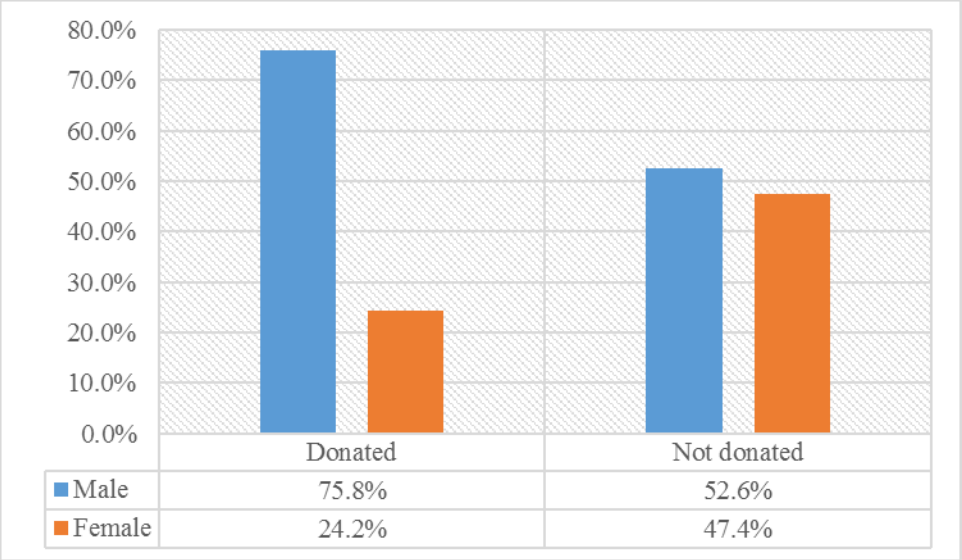
Focusing on sex of respondent, the assumption was that, men are mostly likely to be found donating blood than females. In supporting to this assumption many reasons could bar women from donating, and hence their low number. Women could not be donating as much as men did because they are facing a lot of obstacles like pregnancy periods; menstruation cycle periods in which, on such medical grounds, would not allow them to donate blood. As Table 4.2 illustrates, a total of 128 respondents responded to this question. The findings indicate that, 25(75.8) males donated blood and 50(52.6%) had not, compared to 8(24.2%) females who donated blood and 45(47.4%) who did not. Therefore, the majority of those who donated blood were males compared to females, at 25(75.8%) versus 8 (24.2%) respectively (Table 4.2). The results are consistent with what was expected earlier on. These results support the observation from a study that was conducted by Tscheulin and Lindermeier (2005), who concluded that, men showed a higher motivation to donate than women. Presumably, for same reasons, Burnett and Leigh (1986) indicate a similar conclusion and states that, blood donors are more frequently to be found among male heads of families.

Table 4.2: Sex of respondents versus blood donation (N=128)

	Have you ever donated blood			
Sex	**Yes**		**No**	
Male	25	75.8%	50	52.6%
Female	8	24.2%	45	47.4%
Total	33	100%	95	100%

Source: Study findings (2017)

Figure 4.4: Sex of respondents and blood donation (n=128)



Source: Study findings (2017)

4.3.2.1.2 Age of respondents versus blood donation

The theory assumes that, people tend to decrease donating blood with the increasing of age. Possibly among reasons to support the theory is that, people with high age do rarely donating blood this could include that most aged people are being in more risk or are often easily attacked by disease than people of younger age because of their decreasing body immunity. As seen in Table 4.3 and Figure 4.3, 128 respondents responded to this question. The results indicated that respondents at age group 18-42 years who had donated blood were 26(78.8%) and who did not donate blood were 71(74. 7%) (Table 4.3). While respondents aged group 43-65 years who donated were 7(21.2%) and who did not donate were 24(25.3%) (Table 4.3). Therefore, the results show, that the majority who donated blood were from the age group of 18-42 years who were 26(78.8%) out of 128 versus those age 43-65 years who only 7(21.2%). The results support the earlier suggestion. This finding is consistent with a review of earlier study by Ferguson (1996),

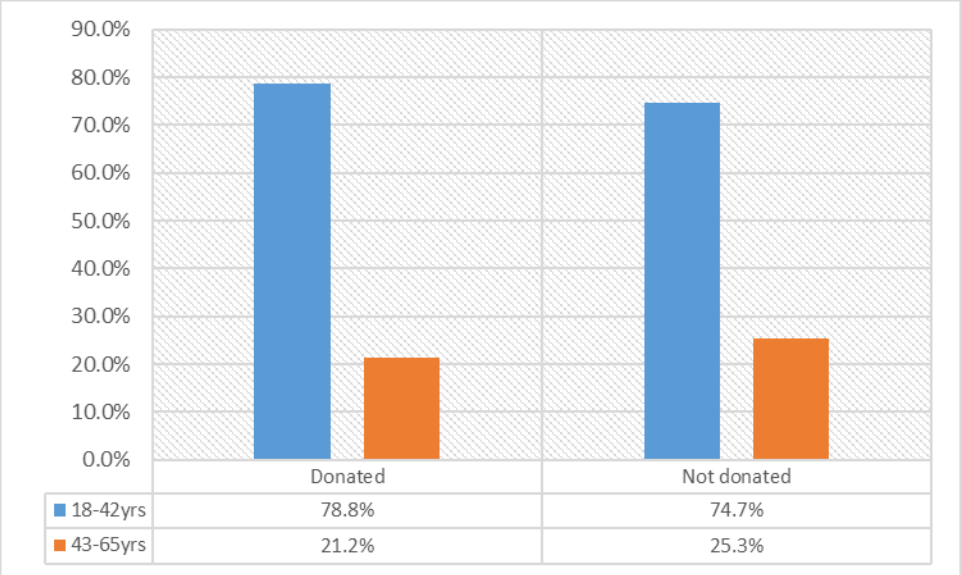
who concluded that younger donors were more likely to donate blood, with subsequent donations decreasing for various reasons as people got older. The study is also similar with data from a study of Hollingsworth and Wildman (2004) with a similar conclusion that young people age 18-35 were found to be regular donors.

Table 4.3: Age of respondent versus blood donation (N=128)

	Have you ever donated blood			
Age	**Yes**		**No**	
18-42yrs	26	78.8%	71	74.7%
43-65yrs	7	21.2%	24	25.3%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.5: Age of respondents and blood donation (N=128)



Source: Study findings (2017)

4.3.2.1.3 Level of education

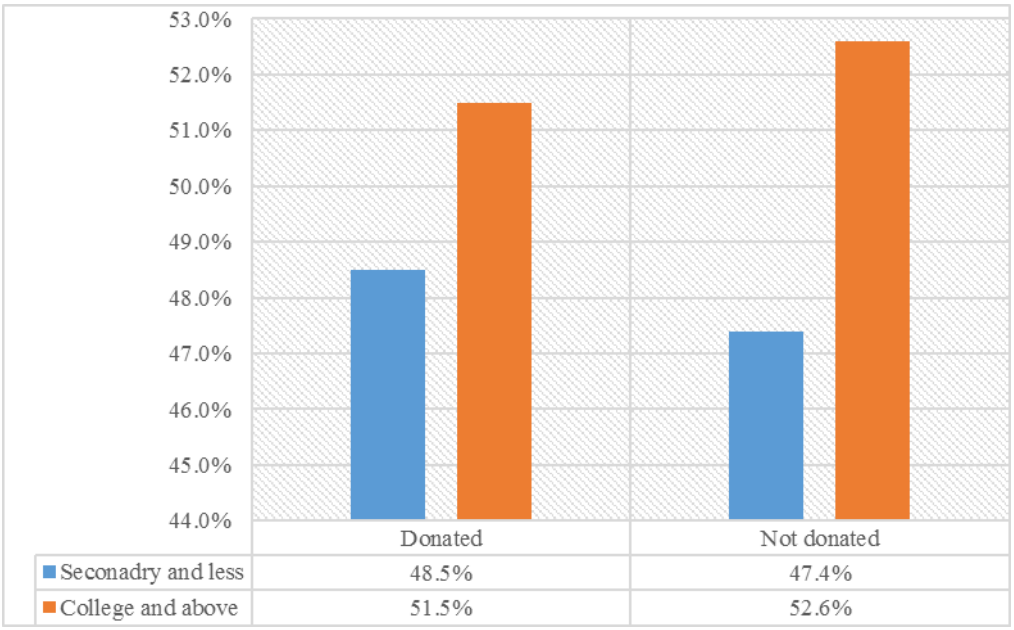
The theory behind the level of education (years of schooling) suggests that, the higher the level of education one has the more likely he/she donates blood more. This means that people with higher education are expected to be found mostly blood donors. This is because educated people are assumed to have high knowledge about blood donation and they know the importance of donating blood. A total of 128 respondents responded to this question. Precisely, the findings indicate that, 16 (48.5%) respondents with secondary education and less donated blood and 45(47.4%) had not, compared to 17(51.5%) respondents with college/university education who had donated blood and 50(52.6%) who did not (Table 4.4 and Figure 4.4). Therefore, the majority who donated blood are those with college/university education as opposed to those with secondary education at 17(51.5%) versus 16 (48.5%) (Table 4.4.) This result is consistent to what was assumed at the beginning. However, the results of this study support the observation from the study of Pule *et al.* (2014) who revealed that higher education system was the predicator of intention to donate blood among people. Also, a study of Burnet (1982) found that, by educating people in the society its increases the will to donate blood among the people.

Table 4.4: Levels of education and blood donation (N=128)

	Have you ever donated blood			
level of education	**Yes**		**No**	
Secondary education and less	16	48.5%	45	47.4%
College education and higher	17	51.5%	50	52.6%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.6: Levels of education and blood donation (N=128)



Source: Study findings (2017)

4.3.2.1.4 Health status versus blood donation

With health status, the theory was that medical unfitness, possibly that might only be subjectively perceived, negatively influences the potential donors to donate blood. In support of the theory it could be because of people who are medically unfitness are subjected to diseases and also others are disqualified from donating due to the uses of medications. As Table 4.5 and Figure 4.5 demonstrates, a total of 128 respondents responded to this question. The result presents that, 21(63.6%) respondents with good health had donated blood and 28(29.5%) did not compared to 12(36.4%) respondents with poor health who donated blood and 67(70.5%) who did not (Table 4.5). Hence, the majority who donated blood were respondents with good health compared to respondents with poor health, therefore 21(63.6%) versus 12(36.4%) (see Table 4.5). The results were pursuant with what was predicted earlier. These results are in line with

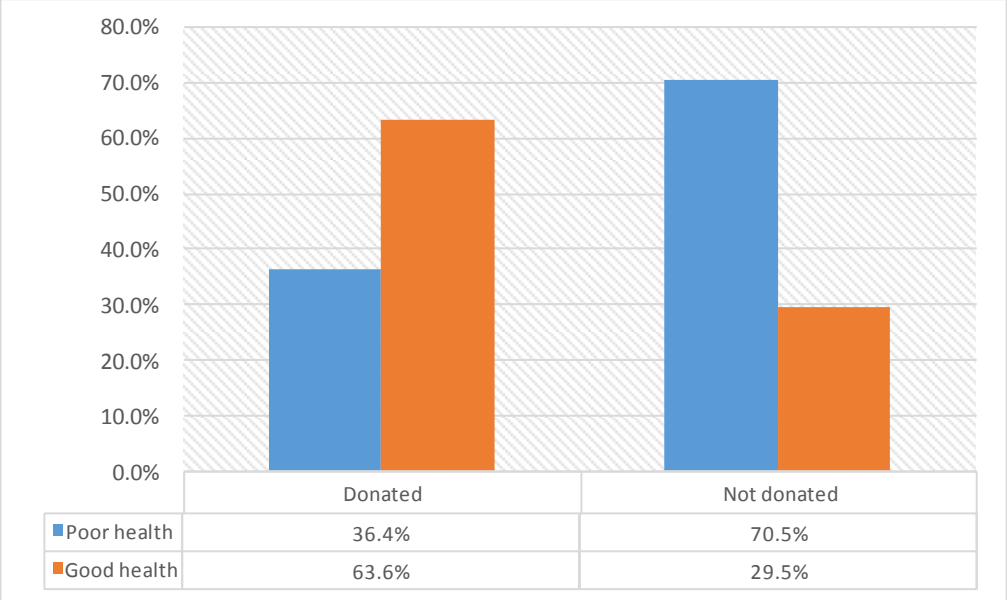
the observation from a study conducted by Godin *et al.* (2007) who concluded that a bad health status of a blood donor is negatively affecting blood donation decision. Furthermore, Njambi (2012) came up with the same findings indicating that poor health of blood donor was one of the significant deterrent factors for not donating blood among people of Nairobi (Kenya).

Table 4.5: Health status versus blood donation (N=128)

	Have you ever donated blood			
Health status	**Yes**		**No**	
Poor health	12	36.4%	67	70.5%
Good health	21	63.6%	28	29.5%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.7: Health status versus blood donation (n=128)



Source: Study findings (2017)

4.3.2.1.5 Cultural beliefs versus blood donation

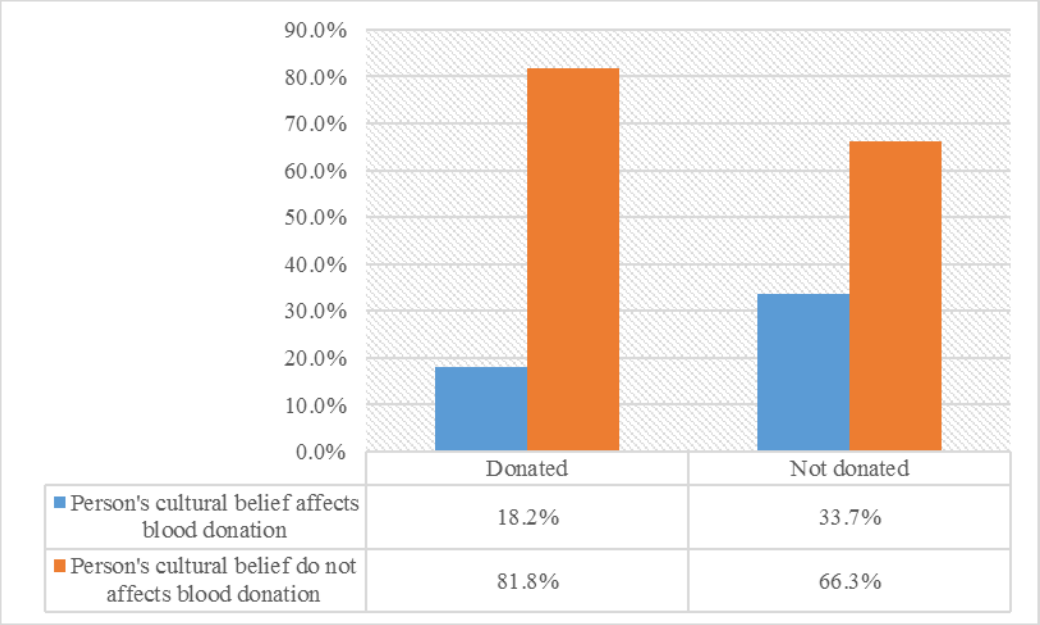
The purpose of including cultural beliefs as one of the determinants of blood donation relied on the assumption that cultural beliefs may hinder people's will to donate blood negatively. This could be due to misinformation, illiteracy and misconception of blood donation activities at the societies/communities. As seen in Table 4.6 and Figure 4.6, a total of 128 respondents responded to this question. The results revealed that 6 (18.2%) respondents with cultural beliefs restrictions had donated blood and 32(33.7%) did not compared to 27 (81.8%) respondents who had no cultural beliefs restrictions also donated blood and 63(66.3%) who did not. Hereafter, the majority who donated blood were respondents who had no cultural beliefs restrictions compared to respondents with cultural beliefs restring them, whereby 27 (81.8%) versus 6 (18.2%) (Table 4.6). The result is accordant with the anticipated theory. These results are supported by the data from a study conducted by Martinez *et al.* (2014) who concluded that cultural beliefs are most deterrent factor for blood donation decision in sub Saharan Africa.

Table 4.6: Cultural beliefs versus blood donation (N=128)

	Have you ever donated blood			
Cultural beliefs	**Yes**		**No**	
Person's cultural belief affects blood donation	6	18.2%	32	33.7%
Person's cultural belief do not affect blood donation	27	81.8%	63	66.3%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.8: Cultural beliefs versus blood donation (N=128)



	Donated	Not donated
Person's cultural belief affects blood donation	18.2%	33.7%
Person's cultural belief do not affects blood donation	81.8%	66.3%

Source: Study findings (2017)

4.3.2.1.6 Religious beliefs versus blood donation

The theory assumes that religious beliefs may influence positively people to donate blood. This might be because of some religions are supporting blood donation activities (. i.e. Muslims; Christians specifically Romans Catholics (RC) and Lutherans (KKKT)) and religions which do not support blood donation (. i.e. Jehovah Witness and Rastafarai). A total of 128 respondents responded to this question. Findings revealed that 25 (75.8%) respondents who were religious committed had donated blood and 81(85.3%) did not compared to 8 (24.2%) respondents who were not committed to their religions but donated and 14 (14.7%) did not. The majority of who donated were those respondents who were committed to their religions compared to those who were not committed 25 (75.8%) versus 8 (24.2%). Perhaps the results went consistent with the theory, these findings were similar to a study of Asenso and Mensah *et al*. (2013) whose

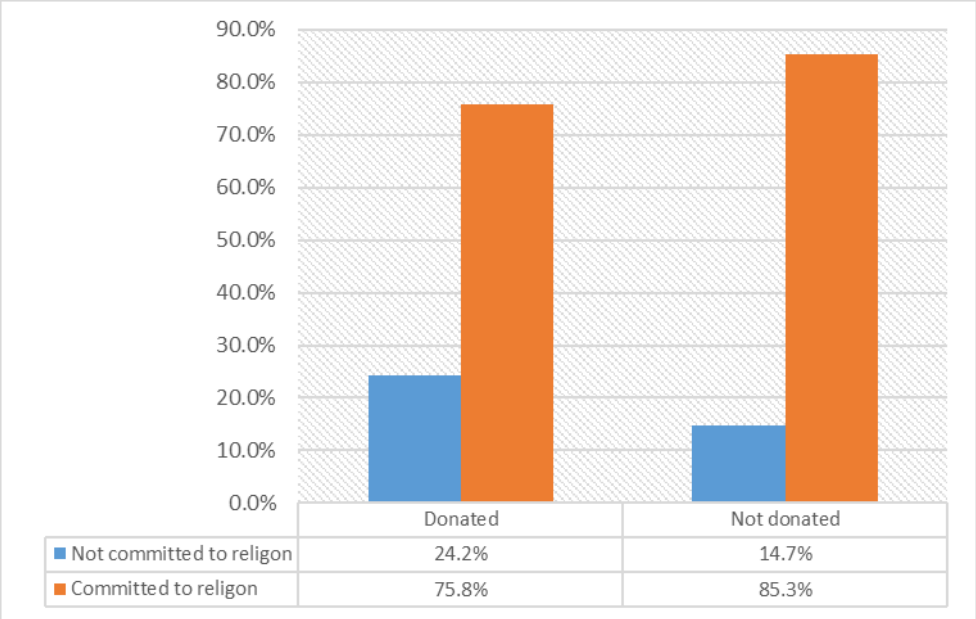
findings showed that some churches and mosques involved in promoting blood donation activities led to increased rate of voluntary blood donations among their followers. Table 4.7 and Figure 4.7 present these findings.

Table 4.7: Religious beliefs versus blood donation (N=128)

	Have you ever donated blood			
Religious beliefs	**Yes**		**No**	
Not committed to religion	8	24.2%	14	14.7%
Committed to religion	25	75.8%	81	85.3%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.9: Religious beliefs and Blood donation (N=128)



Source: Study findings (2017)

4.3.2.1.7 Fear for HIV test results versus blood donation

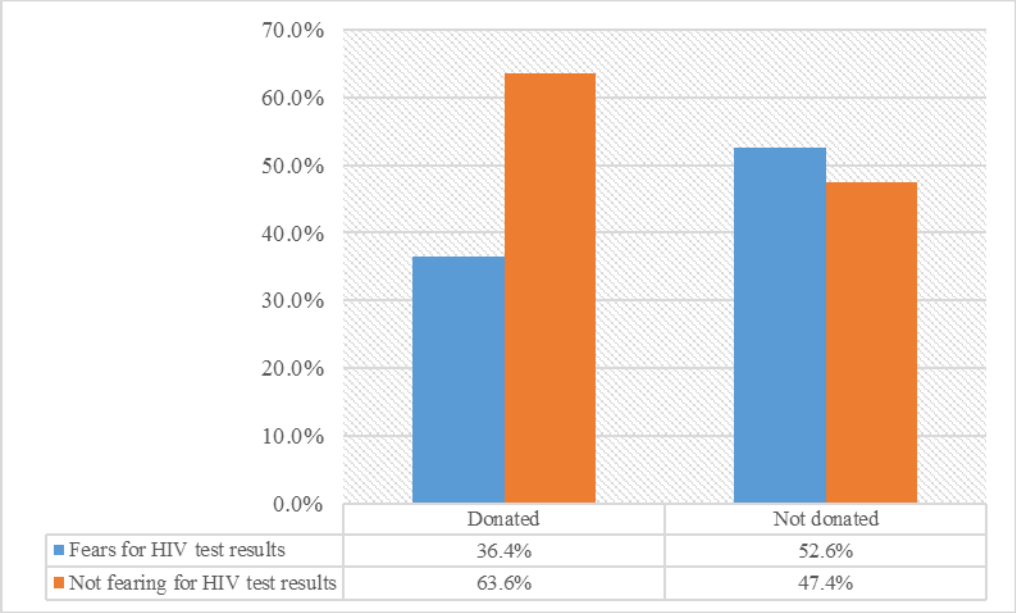
The theory assumes that people have fear for knowing one's HIV status; hence this affect negatively people's will to donate blood. More clarification for the support for this theory could be people having bad sexual life style which it involves unprotected sex and having poor HIV education about blood donation. As Table 4.8 and Figure 4.8 illustrated, a total of 128 respondents responded to this question. The results indicated that 12(36.4%) respondents who feared for HIV test results had donated blood and 50(52.6%) did not. While 21(63.6%) respondents who did not fear for HIV test results had donated blood and only 45(47.4%) did not. The majority of who donated were those respondents who did not fear for HIV test compared to those who feared 21(63.6%) versus 12(36.4%). The result is consistent with the previously theory. These results are concurring with the study of Bloch *et al*. (2012) who concluded that the fear for being tested for HIV discourages most people from donating blood in sub-Sahara Africa. Moreover, data from a study of Njambi (2012) came up with similar conclusion and stated that majority respondents' opinions was fear of having one's HIV status checked was the major obstacle for blood donation.

Table 4.8: Fear for HIV test results versus blood donation (N=128).

	Have you ever donated blood			
Fear for HIV test results	**Yes**		**No**	
Fears for HIV test results	12	36.4%	14	52.6%
Not fearing for HIV test results	21	63.6%	81	47.4%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.10: Fear for HIV test results versus blood donation (N=128).



Source: Study findings (2017)

4.3.2.1.8 Social network at community level versus blood donation

It is held that having good social networks at community level drives a person to donate blood often. This could be because people are motivated to donate blood because of a sense of social responsibility to those who are closed to them (e.g. family members; neighbors; community members). As Table 4.9 and Figure 4.9 demonstrated, 128 respondents responded to this question. The results indicate that, 30(90.9%) respondents with strong social network at community level had donated blood and 84(88.4%) did not. While 3(9.1%) respondents with weak social network at the community level had donated blood and 11(11.6%) did not donate blood. The majority of those who donated were those respondents who strong social relationship at community level compared to those who had weak 30(90.9%) versus 3(9.1%) (Table 4.9). The result follows the expectation. Similar results were found by a study of Karacan *et al., (*2013) who

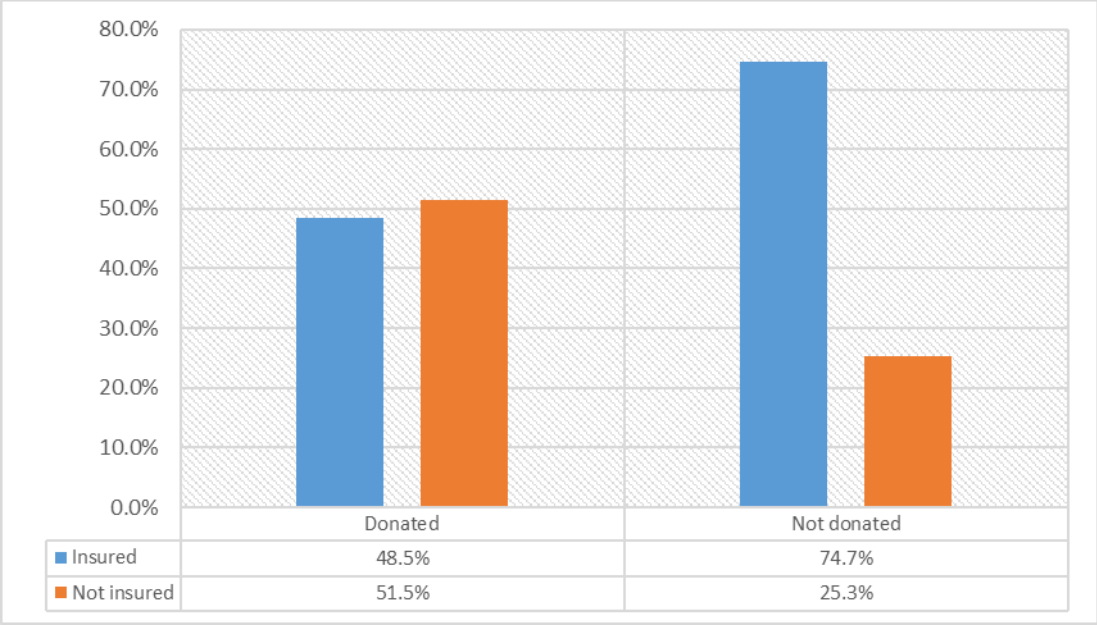
concluded that blood donors are more motivated to donate blood because of the feeling of social responsibility to people who needed blood especially those who were closed to them, like the people from the same community, family and even friends.

Table 4.9: Social networks versus blood donation (N=128)

	Have you ever donated blood			
Social networks at community level	Yes		No	
Strong social network	30	90.9%	84	88.4%
Weak social network	3	9.1%	11	11.6%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.11: Social networks and blood donation (n=128)



Source: Study findings (2017)

4.3.2.2 Economic factors affecting blood donation

Under this domain, the descriptive analysis was done to answer the specific objective that was to examine how economic factors affect blood donation, specifically level of income, employment status and health insurance.

4.3.2.2.1 Level of income versus blood donation

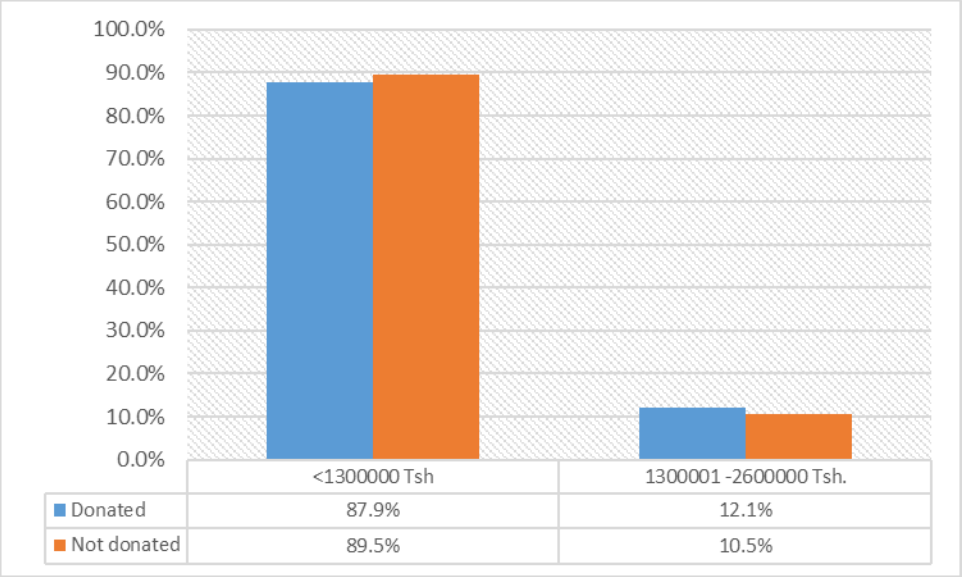
The theory assumed that, people with better income can think they are secure and so do not need to volunteer for blood donation because when their turn comes, they can easily afford to buy blood from the bank. As demonstrated in Table 4.10 and Figure 4.10, 128 respondents responded to this question. The results indicate that, 29 (87.9%) respondent who had less than 1300000 Tsh had donated blood and 85 (89.5%) did not. While 9 (12.1%) respondent with income above 1300000 Tsh had donated blood and 10 (10.5%) did not donate. The majority of who donated were those respondents with income less than 1300000 Tshs compared to those with income above 1300001Tsh 29 (87.9%) versus 9 (12.1%). Therefore, the result is accordance with the assumption. These results are contrary to a study of Renzaho and Polonsky (2012) who concluded that income level was non-significant regarding to blood donation decisions.

Table 4.10: Level of income versus blood donation (n=128)

	Have you ever donated blood			
Level of income	Yes		No	
<1300000 Tsh	29	87.9%	85	89.5%
1300001 -2600000 Tsh.	9	12.1%	10	10.5%
Total	**38**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.12: Level of income versus blood donation



Source: Study findings (2017)

4.3.2.2.2 Employment status versus blood donation

Focusing to employment status of respondents, the expectation was that, people who are employed can think they are secure and so do not need to volunteer for blood donation. The possible explanation could be because there are so busy with office works, so they do not have time for blood donation. As demonstrated in Table 4.11 and Figure 4.11, a total 128 respondents responded to this question. The findings show that, 14 (42.4%) of respondents who were employed had donated blood and 35 (36.8%) did not matched to 8(24.5%) of respondent who were self-employed had donated blood and 39(4.1%) who did not. Plus 11(33.3%) unemployed respondents who had donate and 21 (22.1%) did not donate blood. Therefore, the majority who donated blood were employed respondents compared to the least who were self-employed 14 (42.4%) versus 8(24.5%). Therefore, the results contradict the study's assumption. This result is similar to that of Burgdolf (2016) which concluded that, employed people are more likely to donate blood

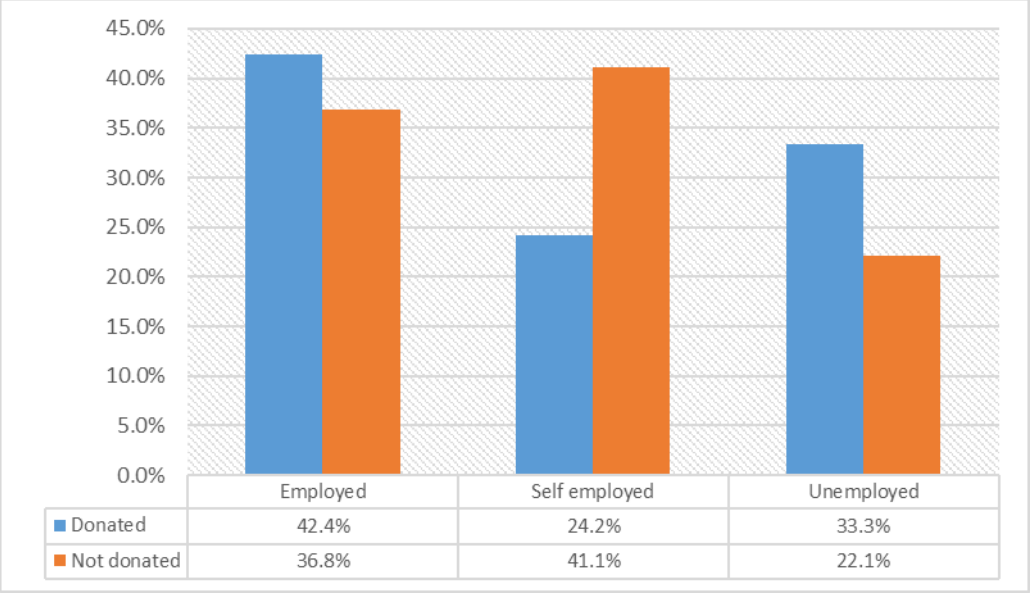
because of the influence of their employer who give them some incentive (i.e. free work day after donating blood and they being paid for a day leave).

Table 4.11: Employment status versus blood donation (N=128)

	Have you ever donated blood			
Employment status	**Yes**		**No**	
Employed	14	42.4%	35	36.8%
Self employed	8	24.2%	39	41.1%
Unemployed	11	33.3%	21	22.1%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.13: Employment status versus blood donation (N=128)



Source: Study findings (2017)

4.3.2.2.3 Health insurance versus blood donation

The theory assumes that, people who are insured are negatively compelled to donate blood. This is because people who are insured think that insurance can cover blood when they need. As illustrated in Table 4.12 and Figure 4.12, a total of 128 people responded

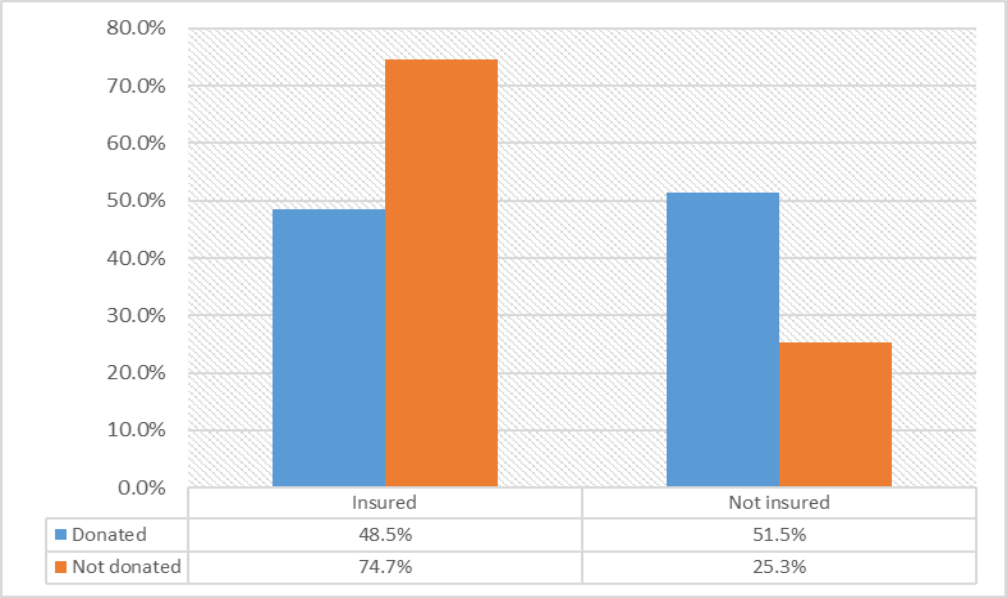
to this question. The results indicate that, 16(48.5%) insured respondents donated blood and 71(74.1%) did not compared to 17(51.5%) uninsured respondents who donated blood and 24(25.3%) who did not. Therefore, the majority who donated blood were uninsured respondents compared to insured ones, by 25(75.8%) versus 8 (24.2%). The results are consistent with the study's assumption.

Table 4.12: Health insurance versus blood donation

	Have you ever donated blood			
Health insurance	Yes		No	
Insured	16	48.5%	71	74.7%
Not insured	17	51.5%	24	25.3%
Total	**33**	**100%**	**95**	**100%**

Source: Study findings (2017)

Figure 4.14: Health insurance versus blood donation (N=128)



Source: Study findings (2017)

4.3.3 Logistic Regression Results

4.3.3.1 Overall Model

The accuracy of the prediction with Pseudo R^2 was 0.35. These results show that, the specified explanatory variables were able to explain the dependent variable blood donation by 35%. The model was statistically significant at 1% level (p = 0.000). The log likelihood was -47.432927, the number of observations was 128, and LR Chi2(2) was 51.25. (Table 4.14).

4.3.3.2 Model specification test

The model was test to see if it was correctly specified. The assumption was that the model is well specified. (H_o: The model is well specified). Gujarati (2004) model for analysis should be well specified. However, the results indicated that a model is well specified because its Hat square had p value of 0.847, this revealed that the 0.847 is greater than 10% level of significant we fail to reject the null hypothesis (H_0) as indicate in (Table 4.14). Therefore, there is sufficient evidence to support the null hypothesis that the model is well specified (see Table 4.13)

Table 4.13: Linktest for model fitness test

Blood donation	Coef.	Std.Err.	z	P value	[95% Conf.	Interval]
_hat	.9728175	.242407	4.01	0.000	.4977086	1.447926
_hatsq	-.0183782	.0953148	-0.19	0.847	-.2051917	.1684354
_cons	.0187717	.3054972	0.06	0.951	-.5799918	.6175352

Source : Study results (2017)

Table 4.14: Logit regression model results

Blood donation		Marginal Effect.	Std.Err.	Z	P value
Age		-0.0032	0.0036	-0.9	0.368
Sex		0.1661*	0.0616	-2.61	0.007
Education level		0.0168***	0.0095	1.77	0.077
Health status		-0.1202*	0.0291	-4.13	0.000
Cultural beliefs		-0.1469**	0.0577	2.27	0.011
Religious beliefs		0.2730***	0.1629	-1.98	0.094
Fear for HIV test		-0.1155***	0.0638	1.83	0.070
Social network		0.0457	0.0758	-0.53	0.547
Level of income		-0.0243	0.0487	-0.5	0.618
Employed1		-0.0767	0.0771	-1	0.319
Self employed2		-0.0982	0.0748	-1.31	0.189
Health insurance		-0.2587**	0.1026	-2.52	0.012
Number of obs	128		Prob =chi2		0.000
Pseudo R2	0.3507				
LR chi2(2)	51.25		Log likelihood		-47.432927

*** Significant at the 0.01 level ** Significant at the 0.05 level * Significant at the 0.1 level

Source: Study findings (2017)

4.3.3.2 Results and interpretation of the research variables

4.3.3.2.1 Sex

As stated in the descriptive section, the assumption with the sex variable was that men donated more blood than women globally, given that the results showed that indeed, sex had positive coefficient and statistically significant at 1% level (p=0.007). The results indicate that, the probability of a male to donate blood was 0.1661 (16.6%), and this suggested that males were more likely to donate blood than females, other things remaining the same (see Table 4.14). This could be due to the fact that males are often thought to have less exclusion criteria than females. For instance, males are usually heavier than females and are therefore more likely to weigh above 50 kg which is the cut-off weight for 41% donations. Also, females are more likely to be anaemic and

hence are more likely to be turned away at donation centres. The result is consistent with the study's assumption. This results are supported with that of Tscheulin & Lindenmeier (2005) who concluded that men show a higher motivation to donate. Also, a similar finding was concluded in India by Signh *et al. (*2005*)* who revealed that men donated more than female because of the patriarchal nature of the Indian community. Also, the study of Mauka *et al*. (2015) at Kilimanjaro Tanzania found that male had higher frequency (75.2%) of donating blood compared to female who had (24.8%). Kimani *et al*. (2011) also came up with a similar result that female was found have low rate of blood donation as male had.

4.3.3.2.2 Level of education

The theory behind level of education (years of schooling) suggests that the higher the level of education one has the more likely he/she donates blood more. This means that people with higher education are expected to be found mostly blood donors. Level of education had positive coefficient and is statistically significant at 1% with (p = 0.077). This result is consistent with theory of level of education. The findings indicated that an increase of one year in school is likely to increase blood donation by 0.0168 (1.6%) when other factors are held constant (see Table 4.14). The promising clarification for this result was that, by being well educated whether school, medias or at local community seminars about blood donation and its advantages in saving lives of patients who are in need of blood transfusion one tends to donate blood more likely. These results are in accordance with that of a study by Pule *et al*. (2014) who found education system was positive and significant predictor of general public towards blood donation intention. Furthermore, similar conclusion was found by a study of Burnett (1982) Appaih *et al*. (2010), Abderrahman & Saleh (2014). However, the results were contradicting with data from a study of Namgay (2004) who found that they were no correlation significance of level of education and blood donation and further they

concluded that high level of education do not lead people to donate blood at Gangtok, East Sikkim.

4.3.3.2.3 Health status

As indicated in the descriptive section, the assumption with the health status was that medical unfitness, possibly only subjectively perceived, negatively influences the potential donors to donate blood. Health status had negative coefficient and is statistically significant at 1% with ($p = 0.000$). The results signify that as number of sickness per person increases, the likelihood for donating blood decreases by 0.1202 (12%) given that other factors hold constant (see Table 4.14; the marginal effect side). The possible explanation for that was unhealthy person particularly suffering (e.g. Malaria, Typhoid, HIV AIDS) are not allowed to donate blood. For that case, the number of blood donors could be decreased over time. The result is consistent with the study's assumption. Similar finding was discovered by Godin *et al*. (2007) who concluded that blood donation decision is negatively affected by health of a donor. In addition, the study of Gibson (2004) and Leibrecht *et al*. (2007) who concluded that the personal perception of a medical unfitness can be a reason for not donating blood.

4.3.3.2.4 Cultural beliefs

As it was highlighted in descriptive section the theory behind is that cultural beliefs may impede people's will to donate blood. This could be due to misinformation, ignorance and misconception of blood donation in the societies. Cultural beliefs had a negative coefficient and statistically at 5% level with ($p= 0.011$). The result is consistent with the study's assumption. This implies that a person with cultural beliefs restrictions is less likely to donate blood by 0.1469 (14.6%) holds other independent factors constant (see Table 4.14). This means that respondents who no cultural beliefs restriction donated more compared to those with cultural restrictions. In support to this finding the data from a study conducted by Martinez *et al*. (2014) who found that cultural beliefs are

most deterrent factor for blood donation decision in sub Saharan Africa. Also, a study by Appiah (2013) found out that cultural beliefs were among the reasons that people from Ghana for not donating blood. Furthermore, a similar conclusion was drawn by a study of Jacob & Berege (1995) in Mwanza Tanzania who revealed that cultural beliefs was main reason for not participating in blood donation. Umeora, Onuh, & Umeora, (2005) and Koster & Hassall (2011) found common myth in their study which made people most not to donate blood at Sub Sahara Africa in which were; a person does not have not enough blood so that cannot donate to someone; people believed that blood transfusion causes spread of disease (e.g. HIV/AIDS).

4.3.3.2.5 Religious beliefs

As shown in the descriptive section, the assumption was that, religious beliefs may influence positively people to donate blood. Religious beliefs had a positive coefficient and statistically significant at 5% level (p=0.094), which implies that, for every unit increase in a person who is religious committed, we expect a 0.2730 (27.3%) increase in log-odds of the dependent variable blood donation hold other independent factors constant (see Table 4.14). The possible explanation is that; a lot of previous authors have discovered that religiosity correlates strongly with participation charitable giving (i.e. blood donation) hence it is seen as religious beliefs encourage people donate blood. The result is consistent with the assumed theory. This finding corroborates the study of Healy (2000) who concluded that people who were involved in religious activities are more likely to donate blood than those who do not. The observation by Allain *et al*. (2003) and Asenso-Mensah *et al*. (2013) also concluded that, some churches and mosques drives their followers/believers to donate blood and save life of patient who are in need. On contrary, Appiah (2013) came up with different conclusion that religious can be deterrent factor for blood donation (i.e. Jehovah Witness, they said that there is a soul in the blood. Due to that, you cannot transfer your soul to someone else no blood donation).

4.3.3.2.6 Fear for HIV test results

Fear for HIV test result had negative coefficient and statistically significant at 1% level (p=0.070). As highlighted in the descriptive section, the assumption was that fear for HIV test results had a negative impact on people's will in donating blood. The results presented that a person with fear for HIV test results is less likely to donate blood by 0.1155 (11.5%) provided that other factors remaining constant (see Table 4.14). This could be explained that the life style of a person create worry on whether if tested with HIV, results could be positive. This could put a person into a stressful life. The result is consistent with the study's assumption. This study result was similar with the study of Shenga *et al*. (2009) who indicated that 80% of the participants showed a positive attitude towards blood donation; however, only 16% of the respondents in this study had actually ever donated blood voluntarily. Fear for pain from needles and fear for HIV diagnosis test were found to be the main reasons for not donating blood.

4.3.3.2.7 Health insurance

As it was presented in the descriptive section, the hypothesis was that people who are insured are negatively driven to donate blood. Health insurance had negative coefficient and statistically significant at 1% level (p=0.012). The findings indicate that, an increase of one insured respondent, will decrease the likelihood of donating blood by 0.2587 (25.8%) (see Table 4.14). This implies that most of insured respondents did not donate blood as compared to uninsured respondents. This result is consistent with the study's assumption. Possible reasons could be, insured people have confidence that insurance premium which they are paying will cover the cost of blood when needed. This is result is contrary with a study of Mascaretti *et al.*, (2004) who concluded that incentive provided by health insurance companies could be helping motivation towards blood donation (e.g. in Slovenia, an employee may be absent from work on the day of donation with compensation by the employer, payable by the health insurance).

However, the variables such as age have a negative sign and statistically insignificant, social network, level of income and employment status are insignificant, although strong social network at community level have a positive coefficient while age, income level, and employment status were negative a coefficient. They have no relation with blood donation, which means for example, even if level of income decreases by 1% they will be no change in donating blood among respondents. Therefore, this made the researcher not to discuss these insignificants variables.

CHAPTER FIVE

SUMMARY, CONCLUSION AN POLICY IMPLICATIONS

5.1 Summary

The key drive for this study was to investigate the socio-economic factors affecting blood donation in Morogoro Municipal as a case in point. The specific objectives were (i) to determine the effect of social factors on blood donation, specifically age, sex, level of education, health status, cultural beliefs, religious beliefs, fear for HIV test results and social network at community level; (ii) to examine the effect of economic factors on blood donation specifically income level, employment status, and health insurance. It was interest of this study to determine how many respondents actually donated blood and how many do not donate.

The results illustrated that, only 33(26%) of out of 128 had donated blood in the study area while 95(74%) out of 128 never donated blood in their life. The logit model showed that the following six social factors had the following results: sex was positive as assumed and significant (p=0.007); the level of education was positive as presumed and significant (p=0.077). Also, health status was negative as previously though and significant (p=0.000) and the cultural beliefs variable was negative as forecasted and significant (p=0.011). Moreover, religious belief (. i.e. religious commitment) was positive as assumed and significant (p=0.094). Similarly, fear for HIV test results was negative as predicted and significant (p=0.070). On other hand, for economic factors, only one variable was negatively and significant (p=0.012), health insurance (i.e. insured people). However, it was found that age was negative but contrary to expectation and insignificant; also, strong social network at community level was positive as presumed but statistically not significant. The employment status variable was negative as assumed

but not significant and income level was negative but not as ought to be and statistically not significant.

5.2 Conclusions

Based on the study results, it was discovered that blood donation is largely determined by sex, level of education, health status, cultural beliefs, religious beliefs, fear for HIV test results and health insurance. However, blood donation is not determined by age, strong social network at community level, level of income and employment status.

5.3 Policy Implications

The study findings indicated that, sex of respondents had a positive relationship with blood donation. This implies that, females had lower rate of donating blood compared to males. If the government wants to solve this problem, any attempt to increase blood donation frequency should focus to females.

On other hand, if the government wants to generally improve blood donation frequency among people, it must put more emphasis on educating them about the importance of blood donation. Thus, introducing different methods like audiovisuals and school curriculum which entail materials that may improve voluntary blood donation is important.

As it was presented in the findings of the present study, blood donation has declined significantly with poor health status of the people. Hence, the government's deliberate effort in improving the health status of the people across the country if it wants to increase blood donation frequencies is necessary.

The results from the current study has revealed that, cultural beliefs had a negative significant influence on blood donation. This implies that, if health policy makers won't consider bad cultural beliefs and their impact on blood donation, many people will be

more likely to be misled by them which may result in low rate of voluntary blood donation.

Also, the results from this study revealed that, religious beliefs had a positive relationship with blood donation. This means that those respondents with religious commitments were more likely to donate blood compared to those who were not committed. Therefore, if the government encourages people to donate blood on voluntary basis there must be an association of religiosity aspects when promoting it. Hence the scarcity of blood in our hospitals will decline.

Fear for HIV test results was an interesting factor to examine by the current study and was found to have a negative relationship with blood donation. This implies that many people were scared to donate blood because of fear of HIV test status. Therefore, if the government wants to increase rate of people donating blood it should intensively focus on HIV education and importance of blood donation.

Furthermore, health insurance was another variable with negative relationship with blood donation. The results indicated that insured respondents tend not to voluntarily donate blood. In order to solve this problem there is a need for government to increase efforts in designing wider based donor recruitment programmes that will focus to insured people.

5.4 Limitation of the study

This study faced a lot of challenges during data collection. Most of people were reluctant to participate due to busy schedules and thus time constraint; and others demanded for payment for them to participate. In addition, time for data collection was limited thus posing a tight schedule for data collection period.

5.5 Areas for further research

To make a study more general, it could be done using longitudinal or panel data research design which is also time consuming. On other hand, the study should be done in other areas to capture the behaviors of the people since they are culturally diverse. Therefore, there is also a need for further studies to examine the effects of social medias on the blood donation.

REFERENCES

Abderrahman, B. H., Saleh, M. Y. (2014). Investigating knowledge and attitudes of blood donors and barriers concerning blood donation in Jordan. *Procedia - Social and Behavioral Sciences*, *116*(2000), 2146–2154.

Agbovi, K. K., Kolou, M., Fétéké, L., Haudrechy, D., North, M. L., & Ségbéna, A. Y. (2006). Knowledge, attitudes and practices about blood donation. A sociological study among the population of Lomé in Togo. Transfusion Clinical and biological: *Journal of the French Society of blood transfusion*, *13*(4), 260-265.

Ahmed Ansari, Brodie, A. R., Fultz, P. N., Anderson, D. C., Sell, K. W., & McClure, H. M. (1989). Flow microfluorometric analysis of peripheral blood mononuclear cells from nonhuman primates: Correlation of phenotype with immune function. *American Journal of Primatology*, *17*(2), 107-131.

Alex (2010). Transfusion-Transmitted Malaria in Countries Where Malaria is Endemic: A Review of the Literature from Sub-Saharan Africa. From the 2007 survey. *WHO 2010, Geneva, CH.*

Alfouzan, N. (2014). Knowledge, Attitudes, and Motivations towards Blood Donation among King Abdulaziz Medical City Population. *International Journal of Family Medicine*, *7*(3), 105-221.

Allain, J. P. (2011). Moving on from voluntary non-remunerated donors: who is the best donor. *Brit J Haematol 154*: 763–769.

Allain, J., Candotti, D., Soldan, K., Sarkodie, F., Phelps, B., Giachetti, C., Opare-sem, O. (2003). *The risk of hepatitis B virus infection by transfusion in Kumasi , Ghana*, *101*(6), 2419–2425.

Amatya, M. (2013). Study on knowledge , attitude and practice of blood donation among students of different colleges of Kathmandu , Nepal. *International Journal of Pharmaceutical and Biological Archives*, *4*(3), 424–428.

Apata, D. F., Babalola, T. O. O., Adebayo, M. A., & Omotosho, J. S. (2009). Effect of dietary alternative lipid sources on haematological parameters and serum

constituents of Heterobranchus longifilis fingerlings. *Tropical animal health and production*, *41*(3), 371.

Appiah, B., Bates, I., Owusu-Ofori, S and Dunn, A. (2013). Ethical and cultural concerns for health professionals, media and the public in promoting adequate and safe blood transfusion services in Africa: A case study of Ghana. *Vox Sanguinis, 105(2),* 96.

Asenso Mensah, K., Achina, G., Appiah, R., Owusu Ofori, S., & Allain, J. P. (2014). Can family or replacement blood donors become regular volunteer donors? *Transfusion*, *54*(3pt2), 797-804

Bates, I., Manyasi, G. & Medina, L.A. (2008) Reducing replacement donors in sub-Saharan Africa: challenges and affordability. *Transfusion Medicine*, *17(6):* 434–442.

Bingi, C. (2002). A Comparative Study of Factors Affecting Willingness to Donate Blood Among Secondary School/college Students in the Cities of Dar Es Salaam & London. *Muhimbili University College of Health Sciences,* Dar Es Salaam.

Bloch, E. M., Vermeulen, M., & Murphy, E. (2012). Blood transfusion safety in Africa: a literature review of infectious disease and organizational challenges. *Transfusion medicine reviews*, *26*(2), 164-180.

Bourdieu, P. (1986). The force of law: Toward a sociology of the juridical field. *Hastings LJ*, *38*, 805.

Burdine, J. (2013). Promoting Blood Donation in Sub-Saharan Africa: Role of Culture and Interventions, unpublished doctoral dissertation, A&M University Texas.

Burgdorf, K. S., Sørensen, E., Rigas, A. S., Thørner, L. W., Pedersen, O. B., Petersen, M. S., & Ullum, H. (2016). Genetic factors influencing ferritin levels in 14,126 blood donors: results from the Danish Blood Donor Study. *Transfusion*, *56*(3), 622-627.

Burnett, A. K., Chopra, R., Yin, J. A., Clark, R. E., Rohatiner, A., & Milligan, D. W. (2003). A feasibility study of simultaneous administration of gemtuzumab ozogamicin with intensive chemotherapy in induction and consolidation in younger patients with acute myeloid leukemia. *Blood*, *102*(13), 4277-4283.

Burnett, J. J. (1982). Examining the profiles of the donor and nondonor through a multiple discriminant approach. *Transfusion*, *22*(2), 138-142.

Burnett, J. J., & Leigh, J. H. (1986). Distinguishing characteristics of blood donor segments defined in terms of donation frequency. *Journal of Health Care Marketing*, *6*(2).

Charbonneau, J., Cloutier, M. S., & Carrier, lianne. (2016). Why Do Blood Donors Lapse or Reduce Their Donation's Frequency? *Transfusion Medicine Reviews*, *30*(1), 1–5.

Csákvári, T., Kondákor, B., Turcsányi, K., Vajda, R., Boncz, I., Szabó, J., & Pakai, A. (2016). Willingness To Donate Blood Among University Students and the Role of the National Blood Donation Competition in Zala County, Hungary. *Value in Health*, *19*(3), A259.

Cunha, L., Plouzeau, C., Ingrand, P., Gudo, J. P. S., Ingrand, I., Mondlane, J., and Agius, G. (2007). Use of replacement blood donors to study the epidemiology of major blood- borne viruses in the general population of Maputo, Mozambique. *Journal of medical virology*, *79*(12), 1832-1840.

Dahourou H, Tapko J. B, Kienou K, Nebie K, Sanou M (2010). Recruitment of blood donors in Burkina Faso: how to avoid donations from family members. *Biologicals 38:* 39–42.

Dhokhikah, Y., Trihadiningrum, Y., & Sunaryo, S. (2015). Community participation in household solid waste reduction in Surabaya, Indonesia. *Resources, Conservation and Recycling*, *102*, 153-162.

Duboz, P.,& Cuneo, B. (2010). How barriers to blood donation differ between lapsed donors and nono-donors in France.*Transfusion medicine, 20(4),*227-236.

Erhabor, O., Isaac, Z., Yakubu, Ahmed and Adias, T. C (2013). Abortion, ectopic pregnancy and miscarriages in Sub Saharan Africa: Challenges of Rhesus isoimmunisation in Rhesus negative women. *Open Journal of Obstetrics and Gynecology; vol 3: 15-26.*

Farrell, L., Mesiwala, A. H., Wenzel, H. J., Silbergeld, D. L., Crum, L. A., Winn, H. R., & Mourad, P. D. (2002). High-intensity focused ultrasound selectively disrupts

the blood-brain barrier in vivo. *Ultrasound in medicine & biology*, *28*(3), 389-400.

Ferguson, E. (1996). Predictors of future behaviour :a review of the pyschological literature on blood donation.*Britsh Journal of Health pyschology*, *1(4)*, 287-308.

Finck, R., Ziman, A., Hoffman, M., Phan-Tang, M., & Yuan, S. (2016). Motivating Factors and Potential Deterrents to Blood Donation in High School Aged Blood Donors. *Journal of Blood Transfusion*, *2016*, 1–8.

Geofrey, M. (2006). How can relantance of donating blood be reduced? A protocol for a study in Tanzania. Unpublished masters thises, Umea University Tanzania.

Gibson, A., Hebden, J. C., Austin, T., Yusof, R. M., Everdell, N., Delpy, D. T., & Wyatt, J. S. (2004). Imaging changes in blood volume and oxygenation in the newborn infant brain using three-dimensional optical tomography. *Physics in medicine and biology*, *49*(7), 1117.

Gillespie, T. W., Hillyer, C. D. (2002). Blood donors and factors impacting the blood donation decision. *Transfusion Medicine Reviews*, *16*(2), 115-130.

Glynn, S. A., Fride, J., Sacher, R. A., Smith, J. W., Wright, D. J., ... & Gibble, J. W. (1997). Increased prevalence of infectious diseases and other adverse outcomes in human T lymphotropic virus types I-and II-infected blood donors. *Journal of Infectious Diseases*, *176*(6), 1468-1475.

Glynn, S. A., Williams, A. E., Nass, C. C., Bethel, J., Kessler, D., Scott, E. P.,& Schreiber, G. B. (2003). Attitudes toward blood donation incentives in the United States: implications for donor recruitment. *Transfusion*, *43*(1), 7-16.

Godin, G., Conner, M., Sheeran, P., Bélanger Gravel, A., & Germain, M. (2007). Determinants of repeated blood donation among new and experienced blood donors. *Transfusion*, *47*(9), 1607-1615.

Gujarati, D., (2004). Basic Econometrics. United States Military Academy, West Point.

Gumodoka, B., Vos, J., Kigadye, F. C., van Asten, H., Dolmans, W. M., & Borgdorff, M. W. (1993). Blood transfusion practices in Mwanza Region, Tanzania. *Aids*, *7*(3), 387-392.

Healy, K. (2000). Embedded Altruism: Blood Collection Regimes and the European Union's Donor Population. *American Journal of Sociology*, *105*(6), 1633–1657.

Hollingsworth, B., & Wildman, J. (2004). What population factors influence the decision to donate blood?. *Transfusion medicine*, *14*(1), 9-12.

Hosain, G. M., Anisuzzaman, M., & Begum, A. (1997). Knowledge and attitude towards voluntary blood donation among Dhaka University students in Bangladesh. *East African medical journal*, *74*(9), 549-553.

Hossain, M., Kelley-Gagnon, M., & Lipsitz, L. A. (1997). Patterns of orthostatic blood pressure change and their clinical correlates in a frail, elderly population. *Jama*, *277*(16), 1299-1304.

Jacob, B.,& Berege, Z. (1995). Altitudes and belifes about blood donation among adults in Mwanza region, Tanzania. *East Africa Medical journal,* 72(6)

Karacan, E., Cengiz Seval, G., Aktan, Z., Ayli, M., & Palabiyikoglu, R. (2013). Blood donors and factors impacting the blood donation decision: Motives for donating blood in Turkish sample. *Transfusion and Apheresis Science*, *49*(3), 468–473.

Kimani, D., Mwangi, J., Mwangi, M., Bunnell, R., Kellogg, T. A., Oluoch, T., & Oduor, M. (2011). Blood donors in Kenya: a comparison of voluntary and family replacement donors based on a population- based survey. *Vox sanguinis*, *100*(2), *212-218.*

Koster, J., & Hassall, O. W. (2011). Attitudes towards blood donation and transfusion in Bamenda, Republic of Cameroon. *Transfusion Medicine*, *21*(5), 301-307.

Lai, A., Marras, D., Bevan, A., Dosanjh, R. S., Gershon, T. J., Hay, B., … Widhalm, L. (2003). Investigation of factors affecting blood donation intentions. *European Physical Journal C*, *30*(1).

Leblanc, M., & Fitzgerald, S. (2000).Logistic regression for school psychologists.*School psychology. Quarterly*, *15(3)*, 344

Leibrecht, H., Levin, M., Mori, C., Jessup, D., & De Guise, S. (2007). Immunomodulatory effects of organochlorine mixtures upon in vitro exposure of peripheral blood leukocytes differ between free-ranging and captive southern sea otters (Enhydra lutris). *Veterinary immunology and immunopathology*, *119*(3), 269-277.

Lemeshow, S., & Sturdivant, R.X. (2013) Applied logistic regression. *Vol.398*.John Wiley & Son.

Lemmens, K. P. H., Schaalma, H. P., Hoekstra, T., & De Kort, W. L. A. M (2004). Determinants of intention towards blood donation among Young Dutch adults. Abstract book. *NVB Symposium Transfusiegenees kunde, Ede-Wageningen, the Netherlands.* Poster presentation.

Lowe, K. C., & Ferguson, E. (1996). Benefit and risk perceptions in transfusion medicine: blood and blood substitutes. *Journal of internal medicine*, *253*(5), 498-507.

Lyamuya, E.., & Mhalu, F. S. (1996). Human immunodeficiency virus infection and AIDS in east Africa: challenges and possibilities for prevention and control. *East African medical journal*, *73*(1), 13-19.

Martinez, R. M., Bauerle, E. R., Fang, F. C., & Butler-Wu, S. M. (2014). Evaluation of three rapid diagnostic methods for direct identification of microorganisms in positive blood cultures. *Journal of clinical microbiology*, *52*(7), 2521-2529.

Mascaretti, L., James, V., Barbara, J., Cardenes, J.M., Blagoevska, M., Haracic, M., &Rossi, U. (2004). Comparative analysis of national regulations concerning blood safety across Europe. *Transfusion Medicine 14(2)*, 105-112.

Mauka, W. I. *et al.* (2015). Factors Associated with Repeat Blood Donation at the Northern Zone Blood Transfusion Centre in Tanzania. *Journal of Blood Transfusion*, 2015, pp. 1–6.

Mauka, W. I., Mahande, M. J., Msuya, S. E., & Philemon, R. N. (2015). Factors Associated with Repeat Blood Donation at the Northern Zone Blood Transfusion Centre in Tanzania. *Journal of Blood Transfusion*, *2015*, 1–6.

Melku, M., Terefe, B., Asrie, F., Enawgaw, B., Melak, T., Tsegay, Y. G., … Shiferaw, E. (2016). Knowledge, Attitude, and Practice of Adult Population towards Blood Donation in Gondar Town, Northwest Ethiopia: A Community Based Cross-Sectional Study. *Journal of Blood Transfusion*, *2016*, 1–10.

Merav, B. N., & Lena, G. (2011). Investigating the factors affecting blood donation among Israelis. *International Emergency Nursing*, *19*(1), 37–43.

Ministry of Health [Tanzania]. (2005). Tanzania National Blood Transfusion Service Policy Guidelines. Dar es Salaam: MoH

Namgay, S. (2004). *Knowledge and Altitude Towards Blood Donation among the General Population in Gangtok*, East Sikkim (Doctoral dissertation, SCTIMST).

National Blood Transfusion Services Tanzania. (2013). Presentation: Status of Implementation of Quality Management System. In *Evidence for Action National Blood Transfusion Service Regional Exchange and Learning Visit, September 16-20* 2013. Dar es Salaam, Tanzania.

National Bureau of Statistics (2005). Tanzania and ORC Macro, Tanzanian Demographic and Health Survey, 2004 - 2005, Dar es Salaam, Tanzania.

National Bureau of Statistics (2011). Tanzania and ICF Macro, Tanzania Demographic and Health Survey, 2011, NBS and ICF Macro, Dar es Salaam, Tanzania.

Neken, M. (2005). Crowding out in blood donation: was Titmuss right?. *Journal of the European Economic Association*, *6*(4), 845-863.

Njambi, L. (2012). Prevalence of diabetic retinopathy and barriers to uptake of diabetic retinopathy screening at Embu Provincial General Hospital, Central Kenya. *JOECSA*, *16*(1).

Nwogoh, B. Aigberadion, U. and Nwannadi, A. I. (2015). Knowledge, attitude, and practice of voluntary blood donation among healthcare workers at the university of Benin teaching hospital, Benin City, Nigeria," *Journal of Blood Transfusion, 23(3):* 234–321.

Okpara, R. A (1989). Attitudes of Nigerians towards blood donation and blood transfusion. Tropical and geographical medicine. 41(1): 89-93.

Olaiya, M. A., Alakija, W., Ajala, A., & Olatunji, R. O. (2004). Knowledge , attitudes , beliefs and motivations towards blood donations among blood donors in Lagos , Nigeria, 13–17 *Transfusion Medicine*, *2004*, 14,13–17.

Olaiya, M. A., Alakija, W., Ajala, A., & Olatunji, R. O. (2004). Knowledge, attitudes, beliefs and motivations towards blood donations among blood donors in Lagos, Nigeria. *Transfusion Medicine*, *14*(1), 13-17.

Ottong, J. G., Asuquo, E. E. J., Olaniran, N. S., Duke, F. D., & Abia, R. P. (1997). Community mobilization for blood donation, Cross River State, Nigeria. *International Journal of Gynecology & Obstetrics*, *59*(S2).

Pathak, Y. (2010). Handbook of Nutraceuticals: Volume I. *Handbook of Nutraceuticals: Volume I.*

Pealer, L. N., Marfin, A. A., Petersen, L. R., Lanciotti, R. S., Page, P. L., Stramer, S. L., ... & Goodman, J. L. (2003). Transmission of West Nile virus through blood transfusion in the United States in 2002. *New England Journal of Medicine*, *349*(13), 1236-1245

Piliavin, J. A. (1990). Why do they give the gift of life? A review of research on blood donors since 1977. Transfusion, 30, 444-459.

Pule, P. I., Rachaba, B., Magafu, M. G. M. D., & Habte, D. (2014). Factors Associated with Intention to Donate Blood: Sociodemographic and Past Experience Variables. *Journal of Blood Transfusion*, *2014*, 1–7.

Renzaho, A. M. N., & Polonsky, M. J. (2012). Examining demographic and socio-economic correlates of accurate knowledge about blood donation among African migrants in Australia. *Transfusion Medicine*, *22*(5), 321–331.

Schreiber, G. B. (2003). Attitudes toward blood donation incentives in the United States: implications for donor recruitment. *Transfusion*, *43*(1), 7-16.

Shenga, N., Pal, R., Sengupta, S., & Pal, S. (2009). Correlates of voluntary blood donation among people in a hill capital in India. *International Journal of Green Pharmacy*, *3*(2), 167–174.

Singh, A., & Marmot, M. (2005). High blood pressure was associated with cognitive function in middle-age in the Whitehall II study. *Journal of clinical epidemiology*, *58*(12), 1308-1315.

Stanton, C (2001). Every Death Counts: Measurement of Maternal Mortality via the Census. *Bulletin of the World Health Organization, 79 (7): p. 657-664*

Stiglitz, J. E. (2002). Information and the Change in the Paradigm in Economics. *The American Economic Review*, *92*(3), 460-501.

Tagny, C. T., Mbanya, D., Leballais, L., Murphy, E., Lefrère, J. J., & Laperche, S. (2011). Reduction of the risk of transfusion transmitted human immunodeficiency virus (HIV) infection by using an HIV antigen/antibody combination assay in blood donation screening in Cameroon. *Transfusion*, *51*(1), 184-190.

Tagny, C. T., Owusu-Ofori, S., Mbanya, D., & Deneys, V. (2010). The blood donor in sub-Saharan Africa: A review. *Transfusion Medicine*, *20*(1), 1–10.

Tapko J., Sam O and Diarra-Nama A (2007). Status of blood safety in the WHO African region: report of the survey. Brazzaville, Republic of the Congo: *World Health Organization*, Regional Office for Africa.

Tapko, J. B., Mainuka, P and Diarra-Nama, A. J (2009). Status of blood safety in the WHO African region. *WHO Regional Office for Africa*, Brazzaville.

Titmuss, R. (1971). Why give to strangers?. *The Lancet*, *297*(7690), 123-125.

Tscheulin, D. K., & Lindenmeier, J. (2005). The willingness to donate blood: An empirical analysis of socio-demographic and motivation-related determinants. *Health Services Management Research*, *18*(3), 165–174.

Umeora, O. U. J., Onuh, S. O., & Umeora, M. C. (2005). Socio-cultural barriers to voluntary blood donation for obstetric use in a rural Nigerian village. *African Journal of Reproductive Health*, *9*(3), 72–76.

Wiwanitkit, V (2000). A study on attitude towards blood donation among people in a rural district, Thailand Southeast Asian J Trop Med *Public Health*; 31(3): 609-611

Wiwanitkit, V. (2002). Knowledge about blood donation among a sample of Thai university students. *Vox sanguinis*, *83*(2), 97-99.

World Health Organization (2009). Screening donated blood for transfusion-transmissible infections: recommendations, *I Research Policy*

World Health Organization (2010). *Global Blood Safety and Availability*. Facts and figures

World Health Organization (WHO. (2011). Health Situation Analysis in the African Region: Atlas of Health Statistics, 2011. World Health Organization (WHO).

World Health Organization and International Federation of Red Cross and Red Crescent Societies. (2010). Towards 100 % Voluntary Blood Donation A Global Framework for Action. *World Health*, 123.

World Health Organization. (2004, May). WHO scientific group on the assessment of osteoporosis at primary health care level. In *Summary meeting report* (pp. 5-7).

World Health Organization. (2006). *The world health report 2006: working together for health*. World Health Organization.

World Health Organization. (2010). Towards 100% Voluntary Blood Donation: *A Global Framework for Action*. Geneva: WHO.

Zaller, N., Nelson, K. E., Ness, P., Wen, G., Bai, X., & Shan, H. (2005). Knowledge, attitude and practice survey regarding blood donation in a Northwestern Chinese city. *Transfusion Medicine*, *15*(4), 277-286

Zangiacomi Martinez, E., Dos Santos Almeida, R. G., Garcia Braz, A. C., & Duarte De Carvalho, A. C. (2014). Association between religiousness and blood donation among Brazilian postgraduate students from health-related areas. *Revista Brasileira de Hematologia E Hemoterapia*, *36*(3), 184–190.

APPENDICES

APPENDIX I

QUESTIONNAIRE

A SURVEY OF SOCIO-ECONOMIC DETERMINANTS OF BLOOD DONATION IN TANZANIA: A CASE OF MOROGORO MUNICIPALITY.

Dear Respondent,

I am Ernest l Mramba, a student from Mzumbe University Pursuing Master Degree of Science in Project Planning and Management. I humbly request your assistance in filling this questionnaire which intends to collect information for investigating the socioeconomic determinants of blood donation in Tanzania; A case of Morogoro Municipality, Tanzania. The information fills in will be used sole for study purpose only. I will treat your information confidentially.

SECTION A

A.1 Name of respondent: _____

A.2 Telephone number: _____

A.3 Ward name: _____

A.4 Street name: _____

A.5 Questionnaire number: _____

SECTION B: SOCIAL FACTORS		
B1. What is your religion?	B1.	1. ☐ Christian 2. ☐ Muslim 3. ☐ Hindu 4. ☐ None believer 5. ☐ Others
B2. Your sex?	B2.	1.☐ Male 2.☐ female
B3. What is your age?	B3.	_____years.
B4. What is your Marital status?	B4.	1.☐ Single 2.☐ Married 3.☐ Widowed 4.☐ divorced
B5. What is your Education level?	B5.	1☐ Primary education 2☐Secondary education 3.☐ Tertiary education 4.☐ None

B5a. Would you say your health in general is excellent, very good, good, fair or poor?	**B5a.**	1.☐ Excellent 2.☐ Very good 3.☐ Good 4.☐ Fair 5.☐ Poor
B6b. During last 3months, how often have you become sick which made you not to do your daily economic activities as usual?	B6b.	_____ Frequency in numbers of being sick.
B6c. Do you have any chronic disease or diseases that restrict you from donating blood?	B6c.	1.☐ Yes 2.☐ No
B6d. If yes from **B6c** specify type of disease?	B6d.	Specify_____
B7. Are there any cultural beliefs that restricts people to donate blood in your resident Area?	B7.	1. ☐ Yes 2.☐ No
B8. Are you committed to your religion?	B8.	1. ☐ Yes 2.☐ No
B9. Is HIV test results scares you?	B9.	1. ☐ Yes 2.☐ No
B10. Do you have strong social network in community level?	B10.	1. ☐ Yes 2. ☐ No
B11a. Have you ever donated blood?	B11a.	1.☐ Yes 2.☐ No

B11b. During last 5 years, how many times have you ever donated blood?	B11b.	_____ times
B11c. Currently, would you donate blood? If no go to question	B11c.	1.☐ Yes 2.☐ No
B11d. Why are not willing to donate blood?	B11d.	1☐ Fear for needles 2☐ Medically not fit 3☐ Time consuming 4☐ Blood is sold 5☐ No one asked me
SECTION C: ECONOMIC FACTORS OF RESPONDANTS		
C1. What is your current Income level per month?	C.1.	_____Tsh.
C3. What is your current employment status?	C2.	1.☐ Employed 2.☐ Self employed 3.☐ Not employed
C.4 Do you have health insurance?	C.3.	1.☐ Yes 2.☐ No

The end of questionnaire
Thank you for your cooperation.

APPENDIX II

DATA ANALYSIS PRINT OUTS FROM STATA

1. Logistic regression output

```
. use "E:\School\MZUMBE BLOOD DONATION DATASET 2017\12-6-2017.dta"

. logit blood_donation age Sex1 educ status cultural1 ReligiousB1 Fear_for_HIV_1 socialnetwork1 lnincome Emp1 Emp2 H_insurance1

Iteration 0:   log likelihood =  -73.05682
Iteration 1:   log likelihood =  -50.76726
Iteration 2:   log likelihood =  -47.56262
Iteration 3:   log likelihood = -47.433236
Iteration 4:   log likelihood = -47.432927
Iteration 5:   log likelihood = -47.432927

Logistic regression                             Number of obs   =        128
                                                LR chi2(12)     =      51.25
                                                Prob > chi2     =     0.0000
Log likelihood = -47.432927                     Pseudo R2       =     0.3507
```

blood_donation	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
age	-.0278473	.0312291	-0.89	0.373	-.0890552	.0333605
Sex1	1.530582	.6244877	2.45	0.014	.3066091	2.754556
educ	.1450156	.0810212	1.79	0.073	-.013783	.3038142
status	-1.038398	.2897893	-3.58	0.000	-1.606375	-.4704214
cultural1	-1.547561	.6607193	-2.34	0.019	-2.842547	-.2525747
ReligiousB1	1.650689	.7698508	2.14	0.032	.1418096	3.159569
Fear_for_HIV_1	-.9966502	.5611633	-1.78	0.076	-2.09651	.1032097
socialnetwork1	.4488632	.8255731	0.54	0.587	-1.16923	2.066957
lnincome	-.2094606	.4139952	-0.51	0.613	-1.020876	.601955
Emp1	-.7055107	.7554975	-0.93	0.350	-2.186259	.7752371
Emp2	-.9227115	.7236503	-1.28	0.202	-2.34104	.495617
H_insurance1	-1.768669	.6093883	-2.90	0.004	-2.963048	-.5742894
_cons	2.544085	4.957974	0.51	0.608	-7.173365	12.26154

2. Logistic regression output after marginal effect

```
. mfx

Marginal effects after logit
      y  = Pr(blood_donation) (predict)
         =  .13365129
```

variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
age	-.0032244	.00358	-0.90	0.368	-.01025	.003801	34.3359
Sex1*	.1660596	.06157	2.70	0.007	.045375	.286744	.585938
educ	.0167912	.0095	1.77	0.077	-.001821	.035403	12.7578
status	-.1202347	.02913	-4.13	0.000	-.17732	-.063149	1.375
cultur~1*	-.1468956	.05769	-2.55	0.011	-.25996	-.033831	.296875
Religi~1*	.2729798	.16293	1.68	0.094	-.046356	.592315	.171875
Fear_f~1*	-.1155169	.06379	-1.81	0.070	-.240535	.009501	.484375
social~1*	.0457006	.0758	0.60	0.547	-.102855	.194256	.890625
lnincome	-.0242532	.04869	-0.50	0.618	-.11969	.071184	13.0076
Emp1*	-.0767422	.07707	-1.00	0.319	-.227805	.074321	.367188
Emp2*	-.0982074	.07481	-1.31	0.189	-.244825	.04841	.359375
H_insu~1*	-.2586893	.10261	-2.52	0.012	-.459803	-.057576	.679688

(*) dy/dx is for discrete change of dummy variable from 0 to 1

3. Multicollinearity test

```
. collin blood_donation age Sex1 educ status cultural1 ReligiousB1 Fear_for_HIV_1 socialnetwork1 lnincome Emp1 Emp2 H_insurance1
(obs=128)

  Collinearity Diagnostics

                     SQRT                  R-
  Variable      VIF    VIF    Tolerance    Squared
----------------------------------------------------
blood_donation     1.45    1.20    0.6915      0.3085
       age      1.61    1.27    0.6230      0.3770
      Sex1      1.10    1.05    0.9128      0.0872
      educ      1.11    1.05    0.9021      0.0979
    status      1.29    1.14    0.7749      0.2251
 cultural1      1.14    1.07    0.8768      0.1232
ReligiousB1      1.29    1.14    0.7762      0.2238
Fear_for_HIV_1      1.08    1.04    0.9279      0.0721
socialnetwork1      1.15    1.07    0.8702      0.1298
  lnincome      1.53    1.24    0.6553      0.3447
      Emp1      1.82    1.35    0.5489      0.4511
      Emp2      1.94    1.39    0.5155      0.4845
H_insurance1      1.16    1.08    0.8610      0.1390
----------------------------------------------------
  Mean VIF      1.36
```

4. Linktest

```
. linktest

Iteration 0:   log likelihood =  -73.05682
Iteration 1:   log likelihood = -49.298187
Iteration 2:   log likelihood = -47.719175
Iteration 3:   log likelihood = -47.420774
Iteration 4:   log likelihood = -47.414325
Iteration 5:   log likelihood = -47.414317
Iteration 6:   log likelihood = -47.414317

Logistic regression                                     Number of obs   =        128
                                                        LR chi2(2)      =      51.29
                                                        Prob > chi2     =     0.0000
Log likelihood = -47.414317                             Pseudo R2       =     0.3510

------------------------------------------------------------------------------
blood_donation |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
         _hat |   .9728175    .242407     4.01   0.000     .4977086    1.447926
       _hatsq |  -.0183782   .0953148    -0.19   0.847    -.2051917    .1684354
        _cons |   .0187717   .3054972     0.06   0.951    -.5799918    .6175352
------------------------------------------------------------------------------
```