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Socio-Economic Determinants of Blood Donation in Tanzania

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Abstract *The study was determined to look on the relationship between socio-economic determinants and blood donation in Tanzania. It involved a sample of 128 respondents in which binary logistic regression results showed sex of respondents, level of education and religious beliefs to have a positively relationship with blood donation at 1%, 10%, 10% level respectively, with p values of 0.007, 0.077, 0.094 as theory suggested. Health status, cultural beliefs, fear for HIV test results, and health insurance 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, employment status, and level of income were not significant determinants. 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.*

Key words Blood donation, socioeconomic determinants, binary logistic regression model

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1. Introduction

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. World Health Organization, 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 Ministry of Health, 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 (TNBTS, 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 (TNBTS, 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; TNBTS, 2013).

Despite of all these 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 (TNBTS, 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) 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. In culture, 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.

2. Literature review

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.

2.1. 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 or 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 and 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. 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.

2.3. 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 (Wiwantitkit, 2002; Bingi, 2002). The Altruism perspective contends that donor volunteer to donate blood for their personal prestige in the society. Gillespie and 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.

3. Empirical literature review

Mauka *et al.* (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.

Pule *et al.* (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 students 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 and 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 include friends, encouraging media, and religion was influential factors affecting their knowledge and attitudes related to blood donation. Renzaho and 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.

4. Methodology of research

4.1. Study Area

This study was conducted in Morogoro Municipality. This municipal was chosen because it is one of the regions with low level of voluntary blood donors due to various socioeconomic determinants as it was documented in 1999/2004 RHO.

4.2. Target Populations and sample size

The population for this study was people living in Morogoro Municipality specifically from 6 wards namely SabaSaba, Mji mkuu, Mazimbu, Mwembesongo, Kilakala and Boma Road. The units of analysis of the study were residents aged between 18 to 65 years. According to Njambi, (2012), this is a right age for illegible blood donor. In this study, structured questionnaire were used to get information from 128 respondents.

4.3. Data analysis – Analytical Model Used

The relationship between socioeconomic determinants defines blood donation decision. A Logit model was used to analyze the relationship between a decision to donate blood 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 socioeconomic determinants. The Binary Logit model used a logistic cumulative distribution function to estimate probabilities as shown. The Logit function is presented as follows:

$$P = \frac{e^{\beta x}}{1 + e^{\beta x}} \tag{i}$$

$$1 - P = 1 - \frac{e^{\beta x}}{1 + e^{\beta x}} = \frac{1}{1 + e^{\beta x}} \tag{ii}$$

Where, P is the probability of success or failure given e denotes the base of natural logarithms, X_i represents the *i*th socioeconomic determinants; and represents the vector of parameters to be estimated.

$$Y = \beta_0 + \beta_i X_i + \varepsilon \tag{iii}$$

Where Y= Blood donation (1 if one has donated, 0 if one has not donated blood), X_i = set of socioeconomic determinants) and ε = error term. From equation (ii) and (iii), the study analyzed logistic regression equation to be;

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

$$\begin{aligned} Y &= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \\ &\beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon \end{aligned} \tag{2}$$

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; ε = Error or disturbance term.

Table 1. Variables and their measurements

Main variable	Related Variable	Measurement and coding
Dependent variable	Blood donation	Whether one has donated or not. • Coded as, 1= If donated, 0= If has not donated
	Social factors	
	Age	Number of years in school
	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.
	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

5. Results and discussions

5.1. Overall Model

The accuracy of the prediction with Pseudo R² 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 3).

5.2. Model specification test

The model was tested to see if it was correctly specified. The assumption was that the model is well specified. (H₀: 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 (H₀) as indicate in (Table 2). Therefore, there is sufficient evidence to support the null hypothesis that the model is well specified (see Table 2).

Table 2. 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 3. 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

Blood donation	Marginal Effect.	Std.Err.	Z	P value
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)

5.3.1. 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 3). 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 anemic 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 and Lindenmeier (2005) who concluded that men show a higher motivation to donate. Also, a similar finding was concluded in India by Singh *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.

5.3.2. 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 3). 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 Appaih *et al.* (2010), Abderrahman and 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.

5.3.3. 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 3). 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.

5.3.4. 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 3). 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 and Berege (1995) in Mwanza Tanzania who revealed that cultural beliefs were main reason for not participating in blood donation. Koster and 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).

5.3.5. 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 3). 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 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).

5.3.6. 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 3). 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.

5.3.7. 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%) (Table 3). 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 insignificant variables.

6. 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. Nevertheless, blood donation is not determined by age, strong social network at community level, level of income and employment status. Based on this, the government must put more emphasis on educating people about the importance of blood donation. Thus, introducing different methods like audiovisuals and school curriculum which entail materials that may improve voluntary blood donation.

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