

Health insurance determinants in Zimbabwe: Case of Gweru Urban

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This research analysed the determinants of health insurance participation in Gweru Urban. This came in the wake of deteriorating health standards and non participation in health insurance schemes on the part of most Zimbabweans. Given the binary nature of Health Insurance Participation, a PROBIT model was adopted. Regression results show that the household head's level of education, household income, age, family size, and chronic illnesses, are all significant predictors of participation in health insurance schemes. The study argues for the health insurance industry to claim greater involvement in the nation's educational achievements and productivity stimulating endeavours.

INTRODUCTION

The importance of a healthy nation and thus a healthy workforce is undoubtedly key to the survival and wellbeing of any economy. Any hint of deteriorating health standards should thus be expected to be a source of worry for the nation concerned. To this extent, any facilities that guarantee access to health care for the generality of the nation's population may need to be supported. Health insurance schemes are one way of guaranteeing access to health care services. Under such schemes, ideally people should apply for membership and be making monthly contributions so that in the event of any sickness, the health insurer will be able to meet the cost of medical care.

The health insurance market plays an important role in health care services provision. However it should again be noted that the health insurance market also survives on member participation. According to Buntin *et al* (2004), the future of the health insurance market depends on policy interventions to balance supply side and demand side forces. Demand side forces would naturally involve health insurance participation, and for credible policy interventions, it may be important that those factors affecting participation be established. It is in this regard that this research looks at the determinants of health insurance participation in Zimbabwe, and takes the case of Gweru Urban District.

Background to the Study

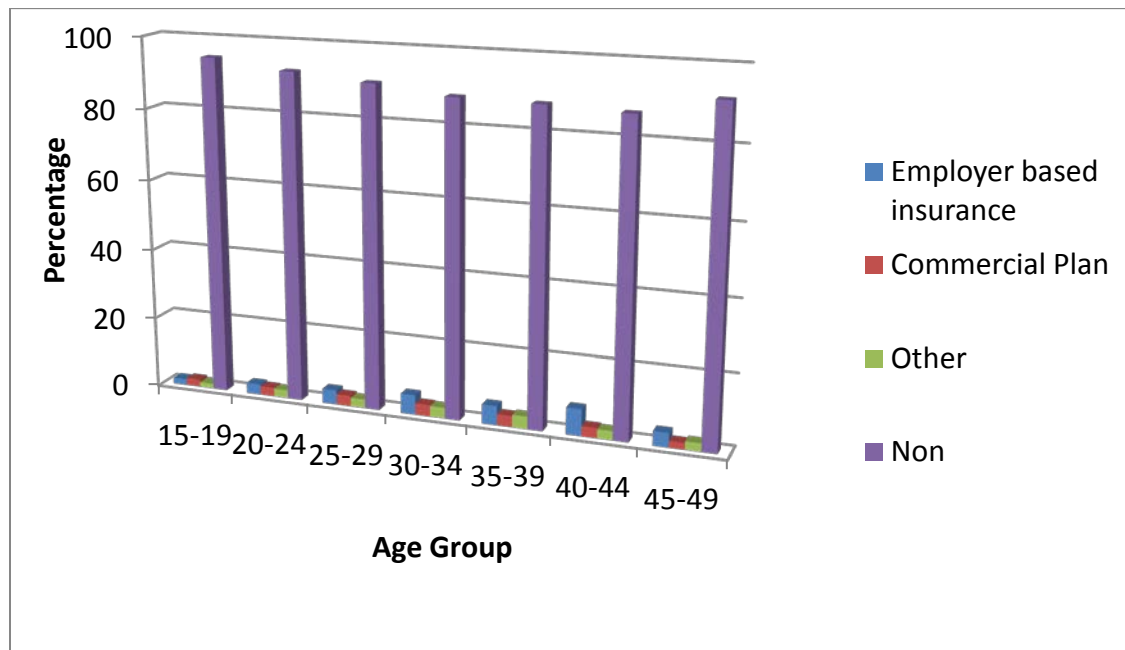
A number of reports on Zimbabwe's health care services point to the deterioration of the health system (USAID 2009; DHS 2005/2006). This situation may be worrisome, given the knock-on effects that poor health standards are bound to have on all macroeconomic variables and on performance of Zimbabwe's economy. A case in point would be, for instance, a report by USAID Zimbabwe (October 2009) in which Zimbabwe's health care system was seen to be characterised by inadequate staffing, reduced accessibility by the general population, shortage of essential drugs and medical supplies, and outdated and poorly functioning equipment. On the same note, Zimbabwe Demographic and Health Surveys (2006) reported that many health indicators had worsened, and these include nutritional status, proportion

of children orphaned or considered vulnerable, poverty measures, number of births attended by health professionals, availability of most essential drugs, severe proportions of maternal and child mortality rates.

In the light of deteriorating health standards in Zimbabwe, Tren and Bate (2005) note that in spite of the Zimbabwean government's massive financial commitment and investments into improving health care delivery within the first 10 years of attaining independence in 1980, most of the gains have since been undone, and life expectancy which had initially risen to 63 years by 1990, dropped to 53 years by 2003. Admittedly there are about 30 medical aid societies in Zimbabwe and both public and private employers provide medical insurance through participation in medical aid societies.

Health insurance coverage is generally on the low side in Zimbabwe. According to Zimbabwe demographic and health survey (2006), 91% of women do not have health insurance. Of the 9% that are covered, 4% have insurance through their employer, 3% are covered under a privately covered commercial plan and the remaining 2% are covered through some other mechanism. This can be shown by way of a bar chart in figure 1.

FIGURE 1
HEALTH INSURANCE COVERAGE IN ZIMBABWE



Source: ZDHS 2005 - 06 (2006)

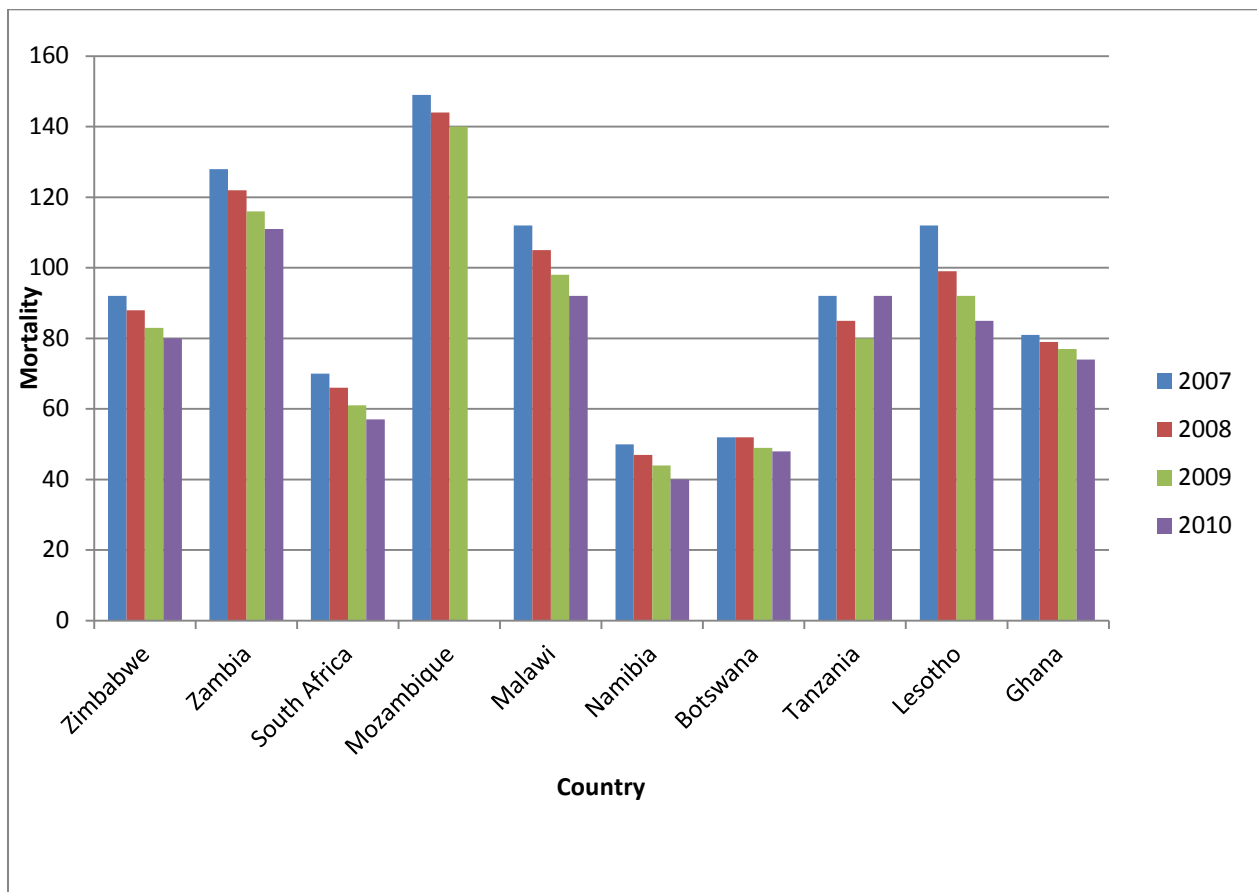
The unavailability of health insurance cover to a significant proportion of the Zimbabwean population, as shown in figure 1, may be seen as precarious, given the report by the National Child Survival Strategy for Zimbabwe (2010), in which the situation around equipment and essential drugs was reported to remain dire. This can be linked to health insurance in that such shortages tend to balloon the cost of medical services and hence call for the need for health insurance as affordability becomes a problem. Common challenges include low capacity of surgical and laboratory services, problems with maintenance of available equipment and obsolescence of some, severe shortages of blood and blood products at district and hospital levels, autoclave machines and oxygen cylinders either absent or non functional, resulting in increased numbers of referrals requiring caesarean sections, neonatal units in central and provincial hospitals without functional resuscitation equipment and incubators. Such

challenges would normally be expected to exert some strain on the nation's resources and make health services expensive or unavailable. Health insurance thus becomes indispensable.

A number of health indicators can be looked at in a bid to see the need for improving health services provision and thus to consider health insurance as an inevitable option. Infant and child mortality rates for instance, could be an important health indicator. Figure 2 below, thus makes a comparison of trends in under 5 mortality rates for selected countries in Africa. From figure 2, one can quickly note that over the period under review, from 2007 to 2010, the under 5 mortality rates are falling for all countries. What may probably be of concern is the rate of decline of mortality rates. For Ghana and Botswana, for instance, it can be noted that the rate of decline is relatively low, though of course one can argue that the countries concerned have enjoyed low mortality rates compared to their counterparts in SADC over the period from 2007 to 2010.

Measuring the performance of the health sector on the basis of the under 5 mortality rate as an indicator, Zimbabwe does not come out as the worst. Like all other countries within SADC, she is doing well and experiencing a decline in the under 5 mortality rates. It is however key to note that, whilst there is that improvement as shown by that favourable movement in the indicator, the mortality rates are still relatively high. For instance one may want to compare Zimbabwe with South Africa, Botswana, and Namibia.

FIGURE 2
UNDER 5 MORTALITY RATES FOR SELECTED AFRICAN COUNTRIES



Source: World Bank (2012)

It may again be noteworthy that the Zimbabwe Demographic and Health Survey (2012) established an upward surge in this indicator in the latest survey. Thus from 2010 to 2011 there appears to be an upward swing in the under 5 mortality rate from 80 deaths per every 1000 births to 84 deaths per every 1000 births.

According to ZDHS 2010-2011 (2012), trends in early childhood can be explored by examining the mortality results from successive rounds of DHS surveys in Zimbabwe. An examination of mortality rates in successive surveys starting with 1988 up to 2011 shows that, whilst the health situation was worsening from 1988 to about the beginning of year 2000, it seems there was some improvement thereafter, especially judging from declining mortality rates from a high of 102 in 1999 to a rate of 82 deaths per every 1000 live births gotten from the 2005-06 survey.

The trends in health indicators like for instance, the under 5 mortality rates which this study relied heavily on, may show a not so good performance of the country's health sector. And, this, coupled with the trends in the nation's uptake of health insurance as illustrated in figure 1, may hint on encouraging the uptake of health insurance as part of the nation's solution. However, for the policy formulation process to take on board such issues in a bid to improve the performance of the nation's health system, it becomes key that a research on the determinants of health insurance participation be conducted.

Theoretical Literature

The conventional theory of demand for health insurance and Nyman's access theory of demand for private health insurance seem to dominate the health insurance literature. According to Santerre and Neun (2010), many of the choices individuals make as health care consumers and providers involve a substantial level of uncertainty. This uncertainty stems from illnesses occurring randomly, unpredictable timing and amount of medical expenses, and therefore patient load and types of treatment also become unpredictable. Santerre and Neun (2010) further argue that people generally dislike risk and are willing to pay some amount of money to avoid it. Consumers thus gain from entering into some risk pooling arrangements as this reduces the variability of the expected losses.

The conventional theory explains factors affecting demand and the uptake of health insurance on the basis of the expected utility model. Santerre and Neun (2010) maintain that the price of insurance, one's degree of risk aversion, the preferential tax treatment of health insurance premiums, and government subsidy on the purchase of health insurance, are all key determinants of health insurance participation. They further underline that the subjective probability of an illness occurring affects the amount of health insurance demanded. Feldstein (2005) tends to concur with Santerre and Neun (2010) in underlining the tax exempt aspect of health insurance premiums and the price effect of health insurance on medical care as key in the consideration to purchase health insurance coverage. It is thus possible to deduce from such assertions that the uptake of health insurance itself may be motivated by the perceived decline in the cost of medical services and the subsidy component from government.

Feldstein (2005) touches on the elasticity of demand for medical care, and argues that differences from premiums resulting from the price elasticity of the demand curve may be great enough for some individuals to prefer self insurance.

On the other hand, Nyman's access theory of demand for private health insurance suggests that people value medical insurance because they desire an income transfer from those who remain healthy in the event they become seriously ill (Nyman 2003). According to Nyman (2003), his access theory of demand for health insurance holds that people purchase health insurance to obtain additional income when they become ill. Insurance companies thus merely transfer insurance premiums from those remaining healthy to those becoming ill. The new theory appears to present a departure from the conventional theory's emphasis on risk avoidance as the major drive in health insurance participation, to the income transfer, as a desired objective when deciding to take up health insurance cover.

Eisenhauer (2006) traces health insurance back to Arrow (1963) who argued for governmental provision of health insurance, through Pauly (1968), who, five years later observed that health insurance often induces moral hazard, resulting in an inefficient reallocation of resources. Pauly (1968) argued that institutionalising such inefficiencies through government regulations was welfare decreasing. Pauly's

thinking dominated the conventional theory of health insurance demand. Especially in emphasising the aspect of moral hazard and adverse selection as well as risk transfer as a major driving force stimulating the uptake of health insurance coverage. Eisenhauer (2006), shows that Nyman's work reconsiders moral hazard. It offers a new perspective on the reasons for consumers to buy medical insurance in the first place.

According to Osei-Akoto (2011), health insurance is widely believed to be one of the most viable and authentic health financing systems. It does not only help in meeting the needs of the health system, but also provides less hurting health payment systems for households. To this extent it is preferable to cost recovery strategies and user fees in much of the developing world. Much of the literature on demand for health insurance, tend to subdivide between the conventional theory, originally explained by Pauly (1968) and the new theory, for which John A. Nyman is one of the proponents. Whilst the conventional theory places emphasis on the price effect of insurance with moral hazard and adverse selection as key challenges of the insurance market and hence welfare decreasing, the new theory looks at insurance as a process facilitating income transfers from those who remain healthy after subscribing to a pool of central funds, to those who become ill. Nyman (2001) suggests that health insurance is thus purchased to obtain that transfer, which is the difference between the payoff and the premium.

The conventional theory according to Nyman (2003) holds that people purchase insurance because they prefer the certainty of paying a small premium to the risk of getting sick and paying a large medical bill. One can quickly see that according to this conventional theory, risks and certainties are an important explanatory variable in the demand for health insurance. People are thus compelled to participate in health insurance because they do not want to get stranded in the event of unforeseen need to pay large health care bills.

As seen by Newhouse (1978), for the purpose of studying the relationship between health insurance and demand, the important point is that insurance is like a subsidy to purchase medical care. It lowers the per unit price of care. This thinking is also in line with Nyman (2001) who argues that the conventional theory of health insurance has held that becoming insured acts like a reduction in the price of health care, just as if the price reduction had occurred exogenously in the market.

Parkin *et al* (2000) noted that everyone demands healthcare at some point in their life, but the people with the largest demands are the elderly, the very young and the chronically sick. They further assert that the costs for most people are high though the frequency of use is low. They emphasise that it is the uncertainties about future incomes that make planning healthcare expenditures difficult, hence in a purely private market system most people choose to finance their health care by insurance. It should thus be evident from the foregoing discussion that uncertainties, age and one's health status feature as key determinants of participation in health insurance.

Related to uncertainties as a determinant of health insurance participation are health risks. According to Parkin *et al* (2000) health insurance markets have the problems of moral hazard and adverse selection. Moral hazard is the tendency for people who are covered by health insurance to use more health service or to be less careful about avoiding health risks than they otherwise could. It can thus be deduced that people get insured because they want to avoid shouldering such risks. On the same note Parkin *et al* (2000) argue that because of adverse selection in the insurance market, those people who know they have a greater chance of falling ill than the average, are the ones more likely to buy health insurance. Insurance companies are thus expected to attract profitable business from low risk customers as they tend to give preference to healthy and employed people. It is thus normal to find that at times some people are not covered because of the extent of risk regarding their health status or because of their payment abilities.

The issue of health risks as a determinant to health insurance participation is underlined by Morris *et al* (2007). They hold that the role of health insurance in addressing uncertainty in the demand for healthcare depends on attitude to risk. They maintain that an individual will pay for insurance as long as the utility it yields is at least as high as the utility they would achieve if they did not buy insurance. They see health insurance as a vehicle to remove uncertainty facing individuals with respect to the timing and magnitude of healthcare expenditure. To this extent people will be prepared to pay a given amount, say R^1 plus a risk premium that depends on their degree of risk aversion.

Morris *et al* (2007) further explore the risks concept and argue that any individual who feels that their probability of illness is greater than the community rate will have an added incentive to insure, and that those with a lower than average probability may choose not to insure unless they are sufficiently risk averse. The community rate, they argue, is normally unacceptable to the low risk group because it is more than what they are prepared to pay. Such people are likely to drop out of the insurance market and will be uninsured.

According to Cutler and Zeckhouser (1998) higher health expenditures arising out of low health status give rise to higher chances of purchasing health insurance. Examples would be for people who are prone to cancerous infections or those with heart related illnesses and therefore who are likely to undergo some costly heart surgery. Other things remaining constant, they may be more likely to purchase health insurance as the costs they are likely to incur should they fall ill are exorbitant, and in most cases, beyond reach. Wang *et al* (2010) looks at the socio cultural dimensions of a society as a possible explanatory variable, arguing that the feasibility of a particular health insurance design is likely to depend on the society's socio cultural dimensions. Here, for instance, a community – based health insurance scheme is more likely to be feasible in a country where ethnic groups demonstrate high social cohesion.

Empirical Literature

The numerous health challenges faced by the Zimbabwean health sector and those of other developing economies resulted in several studies being carried out. For instance, Normand *et al* (1996) suggest that options for additional resources in health services provision come from higher levels of user fees, and wider availability of private insurance. On the same note Savedoff and Sekhri (2004) explored the implications of private health insurance for developing economies and argue that health insurance plays a large and increasing role around the world.

There has not been a lot of debate regarding the importance and relevance of health insurance. In fact, it seems several scholars are in consensus on the important aspects, and debate seems to be on how health insurance coverage can be promoted and, on ways to boost health status of nationals in any nation. Dey and Flinn (2003) developed an equilibrium model of health insurance provision and wage determination. From their study, they established a strong connection between employment decisions and health insurance coverage. Here one can quickly note that if health insurance coverage, in any way, affects employment decisions, then it is bound to impact notably on the nation's wellbeing.

According to Rajeew Ahuja and Jutting (2008), participation can actually be boosted through the manipulation of institutional rigidities such as credit constraints. To them appropriate public interventions are necessary to generate demand for insurance. They saw easing credit as a way out, and their study emphasised the importance of the poor having appropriate saving and borrowing instruments. These sentiments may be closely related to those raised by Sparrow *et al* (2010). Their study focused on the Indonesian case in which the introduction of subsidies was an important step towards meeting Indonesia's ambition for universal health insurance. Public health insurance was seen to improve access to health care through increasing utilization of outpatient health care among the poor.

On the other hand Pauly (2004) carried out a study that focused specifically on developing countries and came up with interesting insights. From his study, the level of out of pocket payments for medical services and the affordability of such health insurance play a crucial role in the demand for insurance. He emphasized that a household unwilling to pay a high but rare out of pocket expense may still be willing to pay the affordable lower annual premium to cover the expense. In this respect it is then the high burden of out of pocket spending that provokes the need for health insurance.

Other scholars have attributed the uptake of health insurance to the consumer's risk assessment. For instance Giesbert (2010) conducted a study that sought to estimate the cross sectional determinants of households' decisions to take up a micro life insurance. He used survey data, and evidence from the study suggested an outstanding role of trust and social networks for the probability of purchasing a micro life insurance. He attributed this to the strongly negative association of the idiosyncratic risk assessment within the household, with the uptake of micro life insurance and underlined that households view the

micro insurance policy itself as a risky option. In this respect the major determinants of participation in health insurance would be the prospect variability of risk and initial wealth.

The aspect of risk aversion can be linked to the findings of Pollack and Kronebusch (2008). Here it was established that in the United States a person's vulnerability to illness and disease makes health insurance necessary and possible. Examples were given of rural areas residents, residents of inner city communities, individuals with chronic illnesses, the disabled poor, the elderly and near elderly, and children with special health care needs.

In a study carried out by Lin Liyne and Zhu Yu (2006), a multi level analysis was carried out on the determinants of social insurance participation in some of China's cities. It came out that at times participation is affected by social policies of the cities and the effects were seen to be significant. Enterprise characteristics were seen to have a relatively vague impact on participation and without obvious regularity on social insurance participation. It is also possible that participation may be determined by a combination of family level pre disposing, perceived need and enabling or disabling factors, as came out of a study by Kincheloe *et al* (2007). In addition to such factors they also underline the key role played by country level enabling or disabling factors, and from their study the strongest predictors of participation in California's Medicaid and SCHIP programs were immigration status, ethnicity, income, age, number of hours a parent worked, and urban residents.

According to Jutting (2003) household income, religion, village characteristics and ethnicity exerted the strongest influence on the probability of participation in community based health insurance schemes in rural Senegal. He noted that whilst the schemes reached the poor in general, the poorest of the poor within the villages found participation financially difficult. He again noted the persistence of social exclusion due to religion or ethnic groups. On the other hand Savedoff and Sekhri (2004) studied the implications of private health insurance for developing countries in which they reviewed the international experiences of several countries. The study showed that private health insurance was significant in countries with widely different levels of income and health system structures. One's employment status was also seen to have a significant effect on health insurance participation, as came out from a study by Bhandari (2002). Unemployed people were most likely to be uninsured. It was established that workers do not participate in employment based health insurance for a number of reasons that include ineligibility, getting denied the opportunity, and one's own choice. The likelihood of having health insurance was again seen to increase with one's level of education. From a log linear analysis of factors affecting the usage of Nigeria's national health insurance scheme (NHIS) carried out by Ibiwoye and Adeleke (2009), It was found that income, occupation, gender, age group, marital status and family size all play some explanatory role in the slow pace of usage of NHIS.

Some interesting insights may be drawn from Gonzalez (2009) who carried out a three part analysis of the impact of acculturation, self rated health, and years of US residency on Latino's take up of health insurance. He established that Latinos often lack Health insurance coverage as a result of the industries in which they work, type of occupations they hold, type of employment status they are granted. From his study it came out that some of the major industries that provide significant employment opportunities for US Latino labour force include agriculture, manufacturing, construction and services. These industries are less likely to provide health insurance coverage and other employer sponsored benefits for their employees. They are less likely to employ on a full time basis, and they are more likely to provide minimal wages, seasonal employment and day labour type of employment arrangements. His study thus confirms that some types of employment arrangements impede the likelihood of certain classes of people to obtain health insurance coverage compared to other classes. The role of cognitive ability and risk aversion was emphasised by Chatterjee and Nielsen (2010). They used an adapted behavioural framework to predict health insurance coverage among employed workers. They established that consumers in the higher quartiles of intelligence are increasingly more likely to have enrolled in an employer's health insurance policy or purchased insurance in the individual market. The research again found out that respondents with a higher tolerance for risk are less likely to be insured than those less risk tolerant.

Household poverty was seen to affect household's health and insurance decisions significantly (Hu Hong – Wei Zhang Lu, 2008). It was established from this study that the poorer the household the higher

the chances of bad health situations and negative will to join in the rural basic social insurance. Solutions were thus seen to involve raising peasants' incomes, enhancing the level of rural social insurance, and to develop a variety of insurance in rural China.

Sikosana (2005) tends to allude to government policy as a key determinant of health insurance participation. He notes that in 2001, Mozambique, Zambia, Tanzania, South Africa and Zimbabwe had developed proposals to introduce compulsory health insurance schemes. Thus where participation is a matter of policy, then it is normal that the level of participation is higher compared to situations in which there is no compulsory government policy regarding health insurance schemes. Sikosana (2005) again discusses the implications of the existence of publicly provided health services on health insurance especially where they are provided for free at the point of delivery. In such cases willingness to pay for health insurance is likely to be compromised, and so participation in health insurance is expected to be low.

According to Sikosana (2005) the expansion of health insurance beyond the formal sector of the economy may not be immediately feasible in most countries in sub – Saharan Africa. This particularly owes to increasing poverty in these countries. This brings in poverty and the existence of non formal sector as possible explanatory variables to health insurance participation. He argues that there seem to be some absence of an adequate population of people in the formal employment necessary to support the health insurance market.

Buntin *et al* (2004) carried out a study on the role of the individual health insurance market, in which they used census data from US census bureau. They found out that at least 45 million Americans remained uninsured, of which most were employed but either could not afford employer sponsored health insurance, or were not offered. The same study again showed that almost 30% of unemployed Americans lacked health insurance. Among the uninsured are entrepreneurs, consultants, small business owners and their employees, as well as most young and often single people. Such findings seem to be in line with those of Ho Jin Lee and Wei-Hua Tian (2004) who maintained that in spite of US health reforms, millions of children remained uninsured in America, a situation that led to the enactment of the State Children's Health Insurance Programme (SCHIP) in an effort to improve the situation.

The Chinese experience as investigated by Bingquin Li (2007) point to the self exclusive "small farmer's attitude" which prevented rural to urban migrant workers from foreseeing the risks that urban life might have, and so recommendations were suggested to improve migrant workers' understanding of the social insurance system.

A research carried out by Bennefield (1996) on the dynamics of economic well being suggested that young adults ranging between 18 and 24 years of age were the most likely of any age group to lack insurance. The same research found out that work experience had a significant effect on health insurance coverage. In this regard, 86.5% of people who worked continuously, and on a full time basis for the period studied, had continuous health insurance coverage. This is unlike part time workers and those who had one or two job interruptions over the period. Those who were poor and the near poor were less likely to have continuous health insurance coverage than others. He found out from his study that health insurance coverage was associated with other life circumstances like employment, retirement, government programme participation, etc. Participation was thus bound to change over time. Women were also more likely to have health insurance coverage as compared to their male counterparts, and this, he attributed to their economic status. Other key determinants from his study included the type of residence and religion, level of education, as well as employment status.

According to Nketiah (2009), access to health insurance is crucial especially to those women in the fertility bracket, as they should meet their health needs and those of their children. He holds that this kind of thinking is encapsulated in the Millennium Development Goals 4 and 5 which resonate around the health of children and women. He thus argues that ownership of health insurance for mothers has the potential of reducing child and maternal mortalities. Nketiah (2009) used a binary logit model and established that key variables in determining participation are income, age, religion, access to health information via television sets and the media. He saw these as significant predictors for women's

participation. He however saw distance to the nearest health facility as inversely related to insurance demand.

Kimani *et al* (2012) used descriptive statistics and multivariate logistic regression analysis to describe the sample characteristics and to identify factors affecting participation in health insurance programme in Nairobi. Females were found to be more likely to participate in health insurance programmes. Those respondents who were formerly in a union and those who were never in a union were less likely to have public insurance coverage. Working in the formal sector was also positively related to enrolment.

Evidence from Sri Lanka as pointed out by Bending and Arun (2011) show that household's experience of family related shocks as well as level of education of the household head are strong determinants of health insurance participation. Here they used probit models on household survey data from Sri Lanka, and specifically, multivariate probit regressions to analyse factors affecting participation in different types of insurance

RESEARCH METHODOLOGY

Model Specification

Quite a number of researches that deal with similar issues of participation have so far been conducted and this research borrows much from such authorities as Weinberger and Jütting (2001), as well as Jütting (2003) who have adopted probit models in their studies. This study adopts almost the same PROBIT procedure which was developed from the need to analyse qualitative (dichotomous or polytomous) dependent variables within the regression framework. It suits well in cases where responses are binary in nature, for instance, yes/no responses, or where response variables are measured ordinally rather than continuously. Probit analysis is more appropriate in cases where the dependent variables are discrete rather than continuous. When the response Y is binary, with the values 0 and 1, the probit equation is

$$P = \Pr (Y = 1/X) = \Phi (X' \beta) \dots\dots\dots(1)$$

Where: Pr = probability

Φ = cumulative distribution function (CDF) of the normal distribution

β = vector of unknown parameters

X = vector of known regressors

Y = sequence of independent binary variables that take values of 1 and 0.

The characteristics of X are taken at average and regressed against Y to determine the influence of each of the variables on the probability of an individual or household to make a decision to participate in health insurance or not to participate.

In a study by Jutting (2003), participation depends on current household income (Y), characteristics of the household head (H), household characteristics (Z), community characteristics (C) and the error term η .

Similarly in this study health insurance participation (HIP) can be presented as a function of a number of variables like the level of income, level of education, age, family size, sex, marital status, one's employment status as well as whether one has a white or blue collar job. This can be shown thus:

$$HIP = f (L_i, L_e, A, A^2, S_f, S, M, J, E_s, C) \dots\dots\dots(2)$$

Where:

HIP: Health Insurance Participation

L_i: Level of Income (expected sign: +)

L_e: Level of Education (expected sign: +)

A: Age of Participant (expected sign: +)

A²: Age as the participant grows older (expected sign: -)

S_f:	Size of Family	(expected sign: +)
S:	Sex	(expected sign: +)
M:	Marital Status	(expected sign: +)
J:	Nature of job, i.e white or blue collar	(expected sign: -)
E_s:	Employment status	(expected sign: -)
C:	Chronic illness	(expected sign: -)

From the above specification, HIP is a binary variable and it takes the values of either 0 or 1. Data shall be collected through interviews, administration of questionnaires as well as observations. To this extent the study will heavily rely on primary data. The population under study shall be that of Gweru Urban district of Zimbabwe and a number of sampling techniques shall be used and these include stratified random sampling as well as convenience sampling. The probit model can then be stated as:

$$HIP = \beta_0 + \beta_1 L_i + \beta_2 L_e + \beta_3 A + \beta_4 S_f + \beta_5 S + \beta_6 J + \beta_7 E_s + \beta_8 C_i + \beta_9 A^2 + \epsilon \dots \dots \dots (3)$$

Data Types and Sources

The study relies on primary data. The data shall be gotten by way of questionnaires administered on the sample. The area covered by the research is Gweru urban, in the Midlands province of Zimbabwe. According to the Parliament of Zimbabwe (2011) this constituency has a population of 48959 people who are housed in 12642 households. Each household is assumed to have an average of 3 people. Following a sample size criteria designed by Bartlett *et al* (2001) an ideal sample size will be at least 5% of the households population. Stratified random sampling technique shall be used for this research. This sampling method is ideal for ensuring that most sections of the population are represented. It takes representative households from each stratum in the population.

Data Collection and Coding

Given the size of the geographical area covered by this study, the laborious nature of the data collection process, as well as the limited time within which this study is conducted, a minimum of 5 research assistants will be engaged for the purpose of questionnaire administration. They will be inducted and be acquainted with the basic skills needed in data collection before they embark on the exercise. The primary instrument shall be a questionnaire whose questions shall require binary choice responses as well as continuous responses. For binary choices, coding shall be used, for instance the response (No) shall generally be coded as (0) while the response (Yes) shall be coded as (1)

Estimation

Stata probit function shall be used for estimation. The data collected shall be tested for Multicollinearity. The existence of Multicollinearity means that some explanatory variables have the same effects on the dependent variable, and this complicates analysis. When high Multicollinearity exists, confidence intervals for coefficients tend to be very wide, and t-statistics tend to be very small. In the event that multicollinearity exists, some variables will have to be dropped as a way of dealing with the problem. Variance inflation factors (VIF) shall be used to detect the problem of multicollinearity.

The data shall also be tested for Heteroscedasticity. This problem occurs when the assumption of constant variance of the error term is violated. The Breusch-Pagan test shall be used to detect the problem of Heteroscedasticity. It is designed to detect any linear form of Heteroscedasticity and it is an option built into Stata. In the event of its presence, robust standard errors will be used to correct the problem of Heteroscedasticity.

After the necessary diagnostic tests a probit regression shall be performed to generate the probit parameters and estimate the health insurance participation model (HIP). Analysis and interpretation shall be on the basis of the marginal effects (MEs). Considering several empirical studies that have been

explored in which most of the variables in the econometrical model adopted for this study have been used, this study should produce dependable and credible outcomes.

Data Presentation and Analysis

Descriptive Statistics

The study involved the use of 10 research assistants who had to be equipped with the basic tenets of questionnaire administration before embarking on the process. 1200 questionnaires were sent out for administration, of which 703 were returned. This gives a response rate of 58.6%. The study focused on the adult population of Gweru urban district in the Midlands province of Zimbabwe. This area comprises 12642 households, according to Parliament of Zimbabwe (2011). The study thus focused on household heads, which could either be female or male. The 703 respondents were in line with recommendations by Bartlett et al (2001) who put forward 5% as an ideal sample size. The statistics are summarised in table 1 below:

**TABLE 1
SUMMARY OF STATISTICS**

Variable	Observation	Mean	std dev	Minimum	Max
Hip	703	0.516359	0.5000881	0	1
Age	703	34.7	11.01845	17	65
Sex	703	0.3	0.4592641	0	1
Marst	703	0.73	0.4641537	0	1
Famsz	703	4.8	2.836702	1	13
Levledu	703	15.4	1.728799	13	18
Empstat	703	0.85	0.3524448	0	1
JobTyp	703	0.54	0.4988223	0	1
Income	703	490.6	507.6964	100	2800
Empspon	703	0.3	0.4604846	0	1
Chronils	703	0.26	0.4391178	0	1

Of the 703 households sampled, 491 were male headed and 212 were female headed. All the respondents fell in the 17 to 65 age range, with 34,734 years being the mean age. The survey showed that family sizes were ranging from 1 member to 13 members per family. The average family size was 4.8, which may translate into 4 members per family since a person cannot be halved. The average education level was a diploma or certificate, and this had to be measured in terms of years of schooling. For instance a diploma would take 16 years of schooling right from Primary school, whilst a degree would take 17 years and then 18 years for one to have acquired post graduate qualification.

The household income was another key variable considered. This had to be income from employment, self employment, or any other activities that one may undertake on a casual basis. Most of those respondents who were neither self-employed nor employed could at least afford to get a \$100 from part time activities per month. The income range was between \$100 and \$2800 per month.

Diagnostic Test Results

The diagnostic tests that were found to be necessary for the data in this study are testing for multicollinearity and testing for Heteroscedasticity.

Multicollinearity Test Results

The data was subjected to some tests for multicollinearity. According to Gujarati (2004), whether multicollinearity is perfect or less than perfect, the effect is such that the coefficients of explanatory variables cannot be estimated with great precision or accuracy. There are a number of ways of detecting multicollinearity in a model. For instance large changes in the estimated regression coefficients after removing or adding more predictor variables should be indicative of multicollinearity existing in the model. In this study **Variance Inflation Factors (VIF)** for multicollinearity was used to test for it and the mean VIF of 1.44 was found (see appendix 5) which is way below the rule of thumb of 5. The VIF test results showed that there is no problem of multicollinearity in the model.

Heteroscedasticity Test Results

The problem of Heteroscedasticity occurs when the OLS assumption that variance of the error term is constant is violated. If error terms do not have constant variance then they are heteroscedastic, and such a problem may need to be corrected. In this study, the Breusch – Pagan test for Heteroscedasticity was used and the following results were obtained:

Ho: Constant variance
 Variables: fitted values of HIP
 chi2 (1) = 53.13
 Prob > chi2 = 0.0000

From the test results, it should be noted that the P – value is significant and we therefore reject the null hypothesis (H₀) that there is constant variance of the error terms and accept the alternative hypothesis of Heteroscedasticity. The problem of Heteroscedasticity detected had to be corrected by way of regressing using robust standard errors.

The Probit Model Regression Results

**TABLE 2
 PARAMETER ESTIMATES USING STATA**

Variable	Coef.	Robust St.Err.	Z	P > z
Chronils	0.3560405	0.1845715	1.93	0.054
Lincome	0.3803951	0.1098858	3.46	0.001
Jobtype	-0.0681736	0.1828244	-0.37	0.709
Employsta	-0.2966358	0.2426876	-1.22	0.222
Levledu	0.3327336	0.0480996	6.92	0
Famsize	-0.0531369	0.0270896	-1.96	0.05
Age	0.333369	0.064565	2.07	0.039
Agesq	-0.0019041	0.0007912	-2.41	0.016
_cons	-9.50439	1.38899	-6.84	0

Number of obs = 703, $\chi^2(8) = 124.24$, P < 0.0000

In the light of the Probit regression results in table 2 above, the estimated model for health insurance participation can be presented thus:

$$\text{HIP} = -9.5 + 0.38L_i + 0.33L_e + 0.33A - 0.05S_f - 0.68J - 0.3E_s + 0.36C_i - 0.02A^2$$

Some variables like Sex (S), marital status (M) and employer sponsorship of health insurance had to be dropped from the regression owing to colinearity. On the other hand the problem of Heteroscedasticity had to be corrected through the use of robust standard errors.

Employment status of the household head, as well as the type of job one works, as in white or blue collar job, were seen to be insignificant. The respondent's level of education came out to have a significant impact on their health insurance participation. This was in line with the expected sign of the coefficient, which is positive. It could well be that as people get more educated, they get better enlightened regarding most aspects pertinent to the well being of their families. More so people may tend to look at their efforts in education as some kind of investment for their families, and so getting reckless with their lives and taking chances when it comes to health matters may not be plausible. It may again be the case that as part of their learning, some may have included in their programmes some aspects of health care, and possibly health insurance too.

The other important variable was the respondent's level of income. Again the positive sign of the coefficient was expected, and the variable was quite significant at 5%. Higher incomes make for affordability. It is thus not surprising that respondents whose household incomes are high tend to have a positive uptake of health insurance, and thus higher chances of participating.

Age as a determinant of health insurance participation was a significant variable at 5%. It emerged that the older one gets, the higher the chances of enrolling for health insurance schemes. It is possible that age comes with a sense of responsibility as well as getting more knowledgeable. With age, people seem to develop a stronger sense of purpose for life and for living, in general. Thus, apart from having acquired some earthly treasures that one may want to enjoy along with their families and loved ones, they are psychologically aiming at self actualisation and want to become the best they can be. This may trigger in them some sense of responsibility, including the need to take care of their health needs. Age (A^2) was however seen to have a negative sign albeit still being significant at 5%. This again was expected. It may be normal that as one gets older, especially as they get beyond their productive years, they may become less and less careful about where they step and how they take care of themselves. In fact they may be a tendency to have one's grown up children taking over most responsibilities in the home including healthcare needs.

It is again possible that the negativity of Age squared owes to the fact that with age some families may have acquired large amounts of wealth to the extent that they are financially fit to rise up to the challenges of most travails likely to befall an average family. As a result the risk of any family member falling sick and therefore requiring large sums in hospital bills may not be as serious to such families as it may be to an average household in Zimbabwe.

The existence of a person with some chronic illnesses in the family like cancer, anaemia, asthma, diabetes, coronary heart disease and many others, was seen to have a positive coefficient. Chronic illnesses are significant at 10%. It could be possible that household heads that have such illnesses in their families are more attentive to health insurance issues than those with no history of chronic illnesses in the family. They probably look at their chances of having to make exorbitant payments towards healthcare expenditure and prefer to trade such possibilities with a stream of affordable healthcare premiums.

Family size was significant at 10% though the negative sign was not to be expected. One would have thought that as the size of the household grows, so do the risks, and so health insurance participation would increase with growth in the size of the household. The negativity may be explained on the basis of the large payments that growing families may have to make towards health insurance premiums. At times this may turn out to be unaffordable and hence a family may end up deciding not to participate at all. This may be seen as ideal especially when there are no chronic illnesses in the family and yet family income is low.

Results Interpretation

**TABLE 3
MARGINAL EFFECTS**

Variable	dy/dx	Std. Err.	z	P> z	[95% C.I.]	X
Chroni~s*	.1142573	.05968	1.91	0.056	-.002715 .23123	.271984
Lincome	.1157169	.03416	3.39	0.001	.048758 .182675	5.5507
Jobtype*	-.0208884	.05621	-0.37	0.710	-.131056 .08928	.646217
Employ~a*	-.0956067	.08175	-1.17	0.242	-.255826 .064612	.791411
Levledu	.1012182	.01371	7.38	0.000	.074344 .128092	15.1288
Famsize	-.0161644	.00833	-1.94	0.052	-.0325 .000171	4.9182
Age	.0405613	.01875	2.16	0.031	.003815 .077308	33.8466
Agesq	-.0005792	.00023	-2.54	0.011	-.001027 -.000132	1285.13

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

The availability of a chronic illness in the family increases the household's probability of participating in health insurance schemes by 11%. On the other hand a unit increase in household income increases the household's chances of participation by 0.12.

Education of the household head was seen to have a positive sign. Thus an additional year of schooling on the part of the household head increases the household's chances of participation by 0.1. The size of the household was negatively related to health insurance participation. An addition to the household by one more member reduces the household's chances of enrolling for a health insurance scheme by 0.02.

Age was seen to be positively related to health insurance participation, except in one's later years in life when the relationship becomes negative. Thus a unit increase in age of the household head increases the probability that the household enrolls for health insurance by 0.04. However as one approaches old age, each additional year reduces the household's probability of participating in health insurance by 0.0006.

Interpretation of Pseudo R²

Pseudo R² gives information relating to the overall significance of the model. It shows how well the explanatory variables explain the dependent variable. In the case of this study, R² is 0.2572 and the P value is significant. The immediate implication is that the relationship seen between HIP and the explanatory variables which are: Marst, Famsz, Levledu, Empstat Jobtyp, Empspon and Chronils, cannot be by chance, but indeed these factors influence 25% of health insurance participation.

Policy Recommendations

Of all the explanatory variables of health insurance participation, the household head's level of education is the most significant at the 5% level. It has a strongly positive coefficient. This should be

important in guiding policy formulation and implementation processes on the part of both health care sector authorities and health insurance providers. Most Governments have, as part of their macroeconomic policy objectives, the desire to realise stable and sustainable economic growth and development, as well as increasing the productivity of the nation's resources. These may feature as some of the most important policy objectives, and yet their attainment largely depends on the quality of the nation's factors of production including the labour force. It thus becomes key, that as many nationals as possible are accorded access to health care facilities. It is in this light that factors affecting health insurance participation should be seen as intermediate targets in the pursuit of the objective to have a healthy labour force needed for sustainable economic growth and development.

Policies may be crafted and implemented to ensure that education is promoted and supported, as a way of getting at wider health insurance coverage and hence a healthy nation and labour force.

The Zimbabwean Government has played a significant role in ensuring access to education by the generality of the Zimbabwean population. This, it has achieved with a lot of support from various sectors of the economy and the international community by way of donor funds channelled towards the education system. The health insurance sector in Zimbabwe may want to take a more involved position in this regard.

This may not be only because directing its corporate responsibility initiatives towards education compliments government's efforts in boosting the nation's productive capacity, but most importantly because this paves way to a prosperous future of the health insurance sector in terms of its own viability.

Income and age are both positively related to the probability of a household participating in health insurance schemes. Again they are highly significant at 5% level. This may be seen to have obvious policy implications. For instance income is in most cases explained by productivity. There are various ways of enhancing productivity of the labour force, and players in the health insurance market may be interested in exploring them as a way of getting at higher incomes for their potential clients. The positive relationship that obtains between household income and the household's chances of enrolling for a health insurance scheme should hint on the health insurance market's perception of medical aid. The market sees this product as a normal good. For instance, with higher incomes households opt for more comprehensive medical aid packages. It is in this regard that the thrust on the part of health insurance providers should be to get involved in productivity stimulating endeavours.

Areas for Further Studies

This study considered the determinants of health insurance participation and adopted the case of Gweru urban district in Zimbabwe. It should be noted that Gweru Urban district is just one of Zimbabwe's 59 districts and thus there is still need to study wider populations to make for wider generalisability of research findings.

CONCLUSIONS

This research looked at the determinants of health insurance participation in the Gweru urban district of Zimbabwe. The probit model was used to analyse data since the dependent variable was dichotomous in nature. The household head's age and level of education as well as household income were seen to be positively related to the probability of a household enrolling for a health insurance scheme. Households with at least one member with a chronic illness were also seen to have their chances to seek cover increased by their circumstances. The study essentially argues for a more involved stance on the part of health insurance service providers as they work together with authorities in the health system to get at wider health insurance participation through intermediate targets like educational attainments and labour productivity.

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