

## **Health insurance coverage in Jamaica: Multivariate Analyses using two cross-sectional survey data for 2002 and 2007**

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## **Health insurance coverage in Jamaica: Multivariate Analyses using two cross-sectional survey data for 2002 and 2007**

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### **Abstract**

**Introduction:** Health insurance is established as an indicator of health care-seeking behaviour. Despite this reality, no study existed in Jamaica that examines those factors that determine private health insurance coverage. This study bridges the gap in the literature as it seeks to determine correlates of private health insurance coverage. The aim of this study is to understand those who possess Health insurance coverage in Jamaica so as to aid public health policy formulation.

**Method:** This study used two secondary cross-sectional data from the Jamaica Survey of Living Conditions (JSLC). The JSLC was commissioned by the PIOJ and the Statistical Institute of Jamaica (STATIN) in 1988. The surveys were taken from a national cross-sectional survey of 25 018 respondents (for 2002) and 6,782 people (for 2007) from the 14 parishes across Jamaica. The JSLC is a self-administered questionnaire where respondents are asked to recall detailed information on particular activities. The questionnaire was modelled from the World Bank's Living Standards Measurement Study (LSMS) household survey. There are some modifications to the LSMS, as JSLC is more focused on policy impacts. The surveys used stratified random probability sampling technique to draw the original sample of respondents. Descriptive statistics were used to provide background information on the sample, and logistic regression was to determine predictors of private health insurance coverage.

**Results:** Health insurance coverage can be predicted by socio-demographic factors (such as area of residence; education, marital status, social support, social class, gender, age), and economic (consumption and income). The findings revealed some similarities and dissimilarities between data for 2002 and 2007. Area of residence, consumption, educational level, marital status, income and social support were determinants over the two periods. Asset ownership was a factor in 2002 but not in 2007. For 2007, age, gender and social class were factors and not for 2002. A dissimilarity in this study was with social support. It was found that in 2002, social support was negatively correlated with Health insurance coverage and this shifts to a positive correlate in 2007. In 2002, age and gender were not associated with Health insurance coverage but these became significant predictors in 2007. Interestingly, poor health status is not correlated with private health insurance coverage. More health insurance coverage is owned by urban than by other town or rural residents.

**Conclusion:** Health insurance coverage is more structured for employed people who are in

the private or public sectors more within urban and other towns than rural areas indicating that rural residents, who are faced high poverty and self-employment, will be more likely in continuing their choice in home remedy or non-traditional medicine in order to address their ill-health. Health which is strongly correlated with income means that poor individuals, families, societies, nations, will be less healthy and will need assistance in the form of health insurance to be able to reduce mortality.

**Keywords:** Health, Health status, Health insurance, Urban, Rural, Jamaica

## **Introduction**

Health is more than the absence of diseases (WHO, 1948); as the absence of diseases is an antithesis (negative definition) of health and does not capture the positive aspects to this phenomenon. In the preamble to its Constitution in 1946, the WHO noted that health includes social, psychological and physical wellbeing; indicating that any measurement of health must include non-epidemiologic factors and that this must recognize the positive ingredients in the construction of health. One scholar coined the terms 'Biopsychosocial model' to explain the different facets that must be understood, evaluated and treated in addressing the care of unhealthy patients (Engel, 1960). Engel's 'Biopsychosocial model' was employed to mean that health includes biological, social, psychology and other determinants. While one scholar opined that this definition of health as forwarded by the WHO as well as by extension Engel was too broad and elusive, and creates a difficulty to measure (Bok, 2004), the WHO's conceptual definition of health recognizes the importance of social and behavioural factors in determining health status. They cannot be omitted in medical care treatment nor should we seek a measurement in order to operationalizing health as this will not be in keeping with the construct of the comprehensive phenomenon.

Caldwell (1993) wrote that the behavioural and lifestyle practices are a major determinant in health (see also, Bourne, 2009), and that this in explaining mortality is not new. Caldwell's perspective does not only highlight the role that people play in their own quality of life; but that their actions (or inactions) hold a crucial part of their health status. Smoking, alcohol consumption, physical inactivity, reckless driving, unhealthy diets and other choices are all decisions people take in life that will either negatively or positively influence their health status, and later will become a public health challenge. The tendency of people to become involved in particular lifestyle practices account for pre-mature mortality for many of them. Material deprivation, psychosocial stressors, high levels of risky behaviour, unhealthy living conditions, social exclusion, perceived lack of control, limited access to good-quality health care, constrained choices and physical inactivity account for higher levels of dysfunctions. According to the WHO (2005), 60% of all death are owing to chronic illness, and that 80% of chronic dysfunctions occur in low-to-middle income countries, which speaks to the growing lifestyle practices (or lack). Material deprivation and psychosocial stressors increased the risk of diseases for poor people and people in general which is embedded in the statistics of the WHO publication.

According to the WHO (2005, p. 66), 95% of Jamaicans with chronic dysfunctions experienced financial difficulties owing to their illness "...and [that] a high proportion of people admitting such difficulties avoided some medical treatment as a result (p. 66). It was also noted that in India diabetic patients spent significantly more of their annual salary on medical care. The statistics from the WHO (2005) showed that 25% of the poor's annual income is spent on private care compared to 4% of people with higher incomes. People are aware that illnesses are inevitable, owing to the high cost of medical care in order to access health care services they will then use health insurance coverage. Health care costs can be so high that people become poor owing to the additional burden of health care cost (Pau & Maharaj, 1989); and the recurring nature of some ailments can deplete people's income and wealth to the point of poverty. It is this reality that accounts for health insurance coverage. Health insurance coverage is a by-product for people because it is demanded for lower treatment costing when illnesses occur. Therefore, health insurance coverage not only lowers treatment cost of illnesses but also lowers the psychosocial stressor on income, and the family's wellbeing.

Morrison (2000) titled an article 'Diabetes and hypertension: Twin Trouble' in which he established that diabetes mellitus and hypertension have now become two problems for Jamaicans and in the wider Caribbean. This situation was equally collaborated by Callender (2000) at the 6<sup>th</sup> International Diabetes and Hypertension Conference, which was held in Jamaica in March 2000. The researcher found that there was a positive association between diabetic and hypertensive patients - 50% of individuals with diabetes had a history of hypertension (Callender, 2000, p. 67). Those diseases are not only lifestyle causing, they can be expensive to treat especially if they are severe. Hence, health insurance coverage is sought in keeping with the probability of illness.

Health insurance is therefore a health care-seeking behaviour and it can be used to indicate people's perception of a futuristic likelihood of illness. It can estimate people's fear of their inability to afford medical costs, their preparation for not wanting to deplete income, lower wealth and the lack of it can account for some premature mortality. From the findings of a cross-sectional study conducted by Powell et al. (2007) of some 1,338 Jamaicans, 19.0% of respondents perceived that their economic wellbeing to be 'very bad'. In addition, when they asked, "Does your salary and the total of your family's salary allow you to satisfactorily cover your needs?" 57.4% of them felt that this "does not cover" their expenses (Powell et al., 2007, p. 29). In addition, out of a maximum score of 10, those in the lower class scored 5.9 for how do they 'feel about the state of their health' compared to a score of 6.6 for those in the upper class and a score of 6.7 for the middle class. This again goes to the rationale of demanding health insurance coverage for the poor people. Bourne (2009) found that there is no significant statistical relationship between health insurance and health care seeking behaviour or health insurance and good health of Jamaicans, suggesting that it is not inaffordability of health care that drives health insurance coverage; but something else.

An extensive review of health literature in Jamaica found no study that has examined determinants of health insurance coverage. Health insurance in Jamaica was a private good up to 2007, and so it could only be had by those who were employed. Hence using data up to 2007 would be examining Health insurance coverage of employed Jamaicans. The aim of this study is to have an understanding of those who possess Health insurance coverage in Jamaica, so as to aid public health policy formulation. In keeping with the aim, this study sought to determine correlates of Health insurance coverage in Jamaica, using cross-sectional data for 2002 and 2007.

## **Methods**

This study used two secondary cross-sectional data from the Jamaica Survey of Living Conditions (JSLC). The JSLC was commissioned by the Planning Institute of Jamaica (PIOJ) and the Statistical Institute of Jamaica (STATIN) in 1988. These two organizations are responsible for planning, data collection and policy guideline for Jamaica, and have been conducting the JSLC annually since 1989. The two cross-sectional surveys used for this study were conducted in 2002 and 2007 (World Bank, 2002; PIOJ & STATIN, 2003; PIOJ & STATIN, 2008). The surveys were taken from a national cross-sectional survey of 25 018 respondents (for 2002) and 6,782 people (for 2007) from the 14 parishes across Jamaica. The surveys used stratified random probability sampling technique to drawn the original sample of respondents. The non-response rate for the 2002 survey was 29.7% and 26.2% for the 2007 survey. The sample was weighted to reflect the population (World Bank, 2002; PIOJ & STATIN, 2003; PIOJ & STATIN, 2008).

The JSLC is a self-administered questionnaire where respondents are asked to recall detailed information on particular activities. The questionnaire was modelled from the World Bank's Living Standards Measurement Study (LSMS) household survey. There are some modifications to the LSMS, as JSLC is more focused on policy impacts (World Bank, 2002). The questionnaire covers demographic variables, health, immunization of children 0–59 months, education, daily expenses, non-food consumption expenditure, housing conditions, inventory of durable goods and social assistance. Interviewers are trained to collect the data from household members. The survey is conducted between April and July annually.

Descriptive statistics such as mean, standard deviation (SD), frequency and percentage were used to analyze the socio-demographic characteristics of the sample. Chi-square was used to examine the association between non-metric variables, and an Analysis of Variance (ANOVA) was used to test the relationships between metric and non-dichotomous categorical variables. Logistic regression examined the relationship between the dependent variable and some predisposed independent (explanatory) variables, because the dependent variable was a binary one (self-reported health status: 1 if reported good health status and 0 if poor health).

The results were presented using unstandardized B-coefficients, Wald statistics, Odds ratio and confidence interval (95% CI). The predictive power of the model was tested using the Omnibus Test of Model and Hosmer & Lemeshow (2000) to examine goodness of fit. The correlation matrix was examined in order to ascertain whether autocorrelation (or multicollinearity) existed between variables. Based on Cohen & Holliday (1982) correlation can be low (weak) - from 0 to 0.39; moderate – 0.4-0.69, and strong – 0.7-1.0. This was used to exclude (or allow) a variable in the model. In addition, variables were excluded from the model if they had in excess of 20% of the cases missing. Odds Ratio (OR) was used to interpret each significant variable.

Multivariate regression framework (Asnani et al., 2008; Hambleton et al., 2005) was utilized to assess the relative importance of various demographic, socio-economic characteristics, physical environment and psychological characteristics, in determining the health status of Jamaicans; and this has also been employed outside of Jamaica (Cohen & Holliday, 1982; James, 2001; Ross et al., 1990). This approach allowed for the analysis of a number of variables simultaneously; and is used to examine health insurance coverage. Secondly, the dependent variable is a binary dichotomous one and this statistic technique has been utilized in the past to do similar studies. Having identified the determinants of health status from previous studies, using logistic regression techniques, final models were built for Jamaicans as well as for each of the geographical sub-regions (rural, peri-urban and urban areas) and sex of respondents using only those predictors.

### **Models**

The current study will employ multivariate analyses in the study of health and medical care seeking behaviour of Jamaicans. The use of this approach is better than bivariate analyses as many variables can be tested simultaneously for their impact (if any) on a dependent variable.

$$HI_i = f(H_t, A_i, G_i, HH_i, AR_i, \ln C, \sum D_i, ED_i, MR_i, S_i, HT_i, \ln Y, CR_i, MC_t, SS_i, T_i, CI_i, P_i, En_i, HSB, \varepsilon_i) \quad (1)$$

Where  $HI_i$  is health insurance coverage of person  $i$ ,  $H_t$  (ie self-rated current health

status in time  $t$ ) is a function of age of respondents,  $A_i$ ; sex of individual  $i$ ,  $G_i$ ; household head of individual  $i$ ,  $HH_i$ ; area of residence,  $AR_i$ ; house tenure of individual  $i$ ,  $HT_i$ ; logged consumption per person per household member,  $\ln C$ ; summation of durable goods and asset owned,  $\sum D_i$ ; Education level of individual  $i$ ,  $ED_i$ ; marital status of person  $i$ ,  $MR_i$ ; social class of person  $i$ ,  $S_i$ ; logged income,  $\ln Y$ ; crowding of individual  $i$ ,  $CR_i$ ; medical expenditure of individual  $i$  in time period  $t$ ,  $MC_i$ ; social support of individual  $i$ ,  $SS_i$ ; social assistance (ie welfare) individual  $i$ ,  $T_i$ ; crime index,  $CI_i$ ; physical environment of individual  $i$ ,  $En_i$ , health care seeking behaviour and an error term (ie. residual error).

The final models that were derived from the general Equation (1) that can be used to predict Health insurance coverage of Jamaicans are Equation (2) and Equation (3):

$$HI_{t(\text{Jamaicans}, 2002)} = f(AR_i, \ln C, ED_i, MR_i, \ln Y, SS_i, \sum D_i, HSB, \varepsilon_i) \quad (2)$$

$$HI_{t(\text{Jamaicans}, 2007)} = f(AR_i, \ln C, ED_i, MR_i, \ln Y, SS_i, A_i, G_i, S_i, HSB, \varepsilon_i) \quad (3)$$

## Measures

An explanation of some of the variables in the model is provided here. Self-reported is a dummy variable, where 1 (good health) = not reporting an ailment or dysfunction or illness in the last 4 weeks, which was the survey period; 0 (poor health) if there were no self-reported ailments, injuries or illnesses (Bourne & Rhule, 2009). While self-reported ill-health is not an ideal indicator of actual health conditions because people may underreport, it is still an accurate proxy of ill-health and mortality (Idler & Kasl, 1991; Idler & Benyamini, 1997; Bourne & Rhule, 2009). Social supports (or networks) denote different social networks with which the individual is involved (1 = membership of and/or visits to civic organizations or having friends who visit ones home or with whom one is able to network, 0 = otherwise). Psychological conditions are the psychological state of an individual, and this is subdivided into positive and negative affective psychological conditions (Diener, 2000; Harris & Lightsey, 2005). Positive affective psychological condition is the number of responses with regard to being hopeful, optimistic about the future and life generally. Negative affective psychological condition is number of responses from a person on having lost a breadwinner and/or family member, having lost property, being made redundant or failing to meet household and other obligations. Health status is a binary measure (1=good to excellent health; 0= otherwise) which is determined from "Generally, how do you feel about your health"? Answers for this question are in a Likert scale matter ranging from excellent to poor. Health care-seeking behaviour is derived from the question: Have you visited a health care practitioner, pharmacist or healer in the past four 4 weeks, with an option of yes or no. For the purpose of the regression was coded as 1=yes, 0=otherwise. Crowding is the total number of individuals in the household divided by the number of rooms (excluding kitchen, verandah and bathroom). Age is a continuous variable in years.

## Results

### *Demographic characteristic and bivariate analyses*

In 2002 the sample was 25,018 respondents: 12,332 males (49.3%) and 12,675 females (50.7%). In 2007 the sample was 6,782 respondents with there being marginally more females (51.3%) than males (48.7%) (Table 1). The findings in Table 1 revealed that urbanization was taken place in 2002, there were 13.4% of respondents living in urban zones

and this shifted to 29.5% in 2007. The percentage of Jamaicans dwelling in rural areas declined from 61% in 2002 to 49.0% in 2007. In 2002, 12.5% of respondents indicated that they had an illness in the 4-week survey period and this increased by 2.4% in 2007. Sixty-four percent of respondents reported having visited a health care facility (including a healer), and this increased to 66% in 2007. The social class categorization of Jamaicans remained relatively the same over the studied period; and the percentage of respondents who had health insurance coverage increased from 11.0% in 2002 to 20.2% in 2007. The mean number of visits made to health care institutions (including healers) declined from 1.7 days to 1.4 days. On the other hand, crowding increased by 135% in 2007 over 2002; and medical care expenditure also increased by 29.1% over the period (Table 1).

The mean annual income of respondents in 2002 was Ja \$331,488 and this increased by 109% in 2007 to Ja \$691,560. On disaggregating income by area of residence, it was revealed that there was significant statistical difference between income of respondents and their area of residents. On average, urban respondents received 1.6 times more income than rural residents in 2007 and this was similar in 2002 (approximately 1.5 times more). The disparity in income between urban and other town respondents was lower (in 2007 – 1.1 times more and this was the same in 2002) than that between urban and rural dwellers.

A significant association was found between health status and self-reported illness ( $p < 0.001$ ) (Table 3). An individual who indicated poor health status was nine times more likely to have an illness than those who did not. On the other hand, an individual who indicated good health status was twice more likely not to report an illness than those who did not indicate an ailment. More males than female (85% vs. 79%;  $p < 0.001$ ) reported good health status and the opposite was true for poor health status (4.2% vs. 5.5%;  $p < 0.001$ ).

There was a change in pattern of the 5-leading recurring illnesses in Jamaica (Table 4). In 2002, hypertension was the leading cause of self-reported dysfunctions (21.6%) followed by cold (19.9%); unspecified ailments (18.1%); diabetes mellitus (11.6%) and asthma (9.6%). However in 2007, the leading prevalence of self-reported ailments shifted to unspecified ailments (23.4%) followed by hypertension (20.6%); cold (14.9%), diabetes mellitus (12.3%) and 9.5% asthma cases. Furthermore, a significant statistical relationship was found between diagnosed recurring illness was gender in both years: In 2002 ( $\chi^2(df = 1) = 125.469$ ,  $p < 0.001$ ) and in 2007 ( $\chi^2(df = 1) = 40.916$ ,  $p < 0.001$ ) (Table 4). Table 4 showed that diabetes mellitus and hypertension were significant more among for females than males and that arthritis, unspecified illnesses, asthma diarrhoea and cold were more prevalent among males than females.

Table 5 showed that there was a significant statistical correlation between medical care-seeking behaviours and gender: In 2002 ( $\chi^2(df = 1) = 9.006$ ,  $p = 0.003$ ) and in 2007, ( $\chi^2(df = 1) = 3.004$ ,  $p < 0.048$ ). In 2002 more females sought medical care (66%) than males (60.7%); and this was the case in 2007: 67.6% for females and 62.3% for males (Table 5).

In 2007, there was a significant statistical relationship between health care-seeking behaviour of Jamaicans and health insurance coverage ( $\chi^2(df = 1) = 16.712$ ,  $p < 0.001$ ). The association was a very weak one ( $r = 0.128$ ). However, the findings showed that 76.2% ( $n = 189$ ) of people with private health insurance visited a health care practitioner compared to 62.0% ( $n = 468$ ) those who do not have health insurance coverage.



### *Multivariate analyses*

In 2007, health insurance coverage in was correlated with logged consumption (OR = 1.90, 95% CI = 1.12 - 3.23); logged income (OR = 1.71, 95% CI = 1.02 - 2.87); durable goods (OR = 1.09, 95% CI = 1.02 - 1.17); marital status (married: OR = 3.91, 95% CI = 2.47 - 6.20); area of residence (urban areas: OR = 2.24, 95% CI = 1.23 - 4.09); education (secondary: OR = 2.97, 95% CI = 1.46 - 6.00; tertiary: OR = 18.76, 95% CI = 8.12 - 43.43); and social support (OR = 0.54, 95% CI = 0.36 - 0.80) (Table 7).

For 2002, health insurance coverage model was a predictive model ( $\chi^2$  (df = 24) = 451.35,  $p < 0.001$ ; Hosmer and Lemeshow goodness of fit  $\chi^2=5.91$ ,  $P = 0.66$ ), with 92.4% of the data being correctly classified (41.1% - correct classification of cases of self-rated Health insurance coverage and 98.4% of cases of self-rated no private health insurance coverage) (Table 7). The model (Table 7) can explain 44.7% of the variability in Health insurance coverage of Jamaicans (for 2002).

Health insurance coverage in Jamaica for 2007 can be determined by 10 variables. These were logged consumption (OR = 1.00, 95% CI = 1.00 - 1.00); logged income (OR = 1.00, 95% CI = 1.00 - 1.00); marital status (married: OR = 1.84, 95% CI = 1.52 - 2.22); area of residence (urban areas: OR = 1.30, 95% CI = 1.08 - 1.57); education (secondary or tertiary: OR = 1.45, 95% CI = 1.09 - 1.92); and social support (OR = 1.33, 95% CI = 1.04 - 1.70); age (OR = 1.01, 95% CI = 1.01 - 1.02); social class (upper class: OR = 1.61, 95% CI = 1.08 - 1.57) and by gender (male: OR = 0.81, 95% CI = 0.69 - 0.95).

For 2007, the factors that determine health insurance coverage in Jamaica is a predictive model ( $\chi^2$  (df = 20) = 590.07,  $p < 0.001$ ; Hosmer and Lemeshow goodness of fit  $\chi^2=7.25$ ,  $P = 0.51$ ), with 79.4% of the data being correctly classified (40.4% - correct classification of cases of self-rated Health insurance coverage and 96.4% of cases of self-rated no private health insurance coverage). For 2007, the model can explain 49.1% of the variability in private health insurance coverage.

### **Discussion**

There are some sociodemographic determinants of health insurance coverage in Jamaica that have remained predictors. These include area of residence, consumption, education, marital status, income and social support. Durable goods were a predictor of health insurance coverage in 2002; however, this is ceased to be the case in 2007. Over time, health insurance coverage was determined by some additional factors such as age, gender, and social class. Of the 6 predictors of Health insurance coverage in Jamaica that continued to be factors in both periods, there is dissimilarity. Social support which was a negative determinant in 2002 reversed to a positive one in 2007. It is expected that those with more social support would be less likely to purchase health insurance coverage as there is a higher probability that they can be assisted in times of medical needs by the social networks with which they are apart. The church, civic associations and societies, family, friends and associates are more likely to extend a helping hand in time of medical need, and this account for the unwillingness of people to purchase private health insurance because this socio-economic support is present.

In 2007, the findings revealed that Health insurance coverage was positively correlated to social support which invalidates the aforementioned perspective. The inflation rate in Jamaica

rose by 194% in 2007 over 2006, which indicates that net disposable individual and household income would have fallen substantially and that each individual would have seen an erosion of his purchasing power coupled with higher cost of living. The direct correlation between social support and Health insurance coverage can be explained by social institutions encouraging its members to purchase insurance to offset the increased costs. They probably may be less likely to offer the same level of assistance to all its members like the previous period when costings were lower. The economic cost will create a challenge for those social networks to spread their limited financial resources over a wider cross-section of people with diverse needs. This then is a part of the explanation why Health insurance coverage was the highest in Jamaica in 2007 (21.2%) over the 2 decades; and in 2007, medical care-seeking behaviour was 66% which fell by 5.7% over 2006.

The current study revealed that married people were more likely to purchased private health insurance than those who were never married and that there is no significant difference in purchase of health insurance between those who were divorced, separated or widowed and those who were never married. In 2002, the findings showed that married people were 4 times more buy Health insurance coverage compared to those who were never married and that this ratio fell to 2 times more in 2007. This lower of disparity in ownership of Health insurance coverage between the married and never married cohorts in Jamaica is an indication of people's willingness to subsidize medical care cost with private health insurance coverage; the lowering of their disposable income owing to increased cost of living; increased awareness of seeking medical care and the high cost of doing so; and the changing typology of diseases which require continuous monitoring by health care practitioners and how this is likely to erode income and wealth, and that this would be best mitigated against through the provision of health insurance.

Another interest finding that is embedded in the disparity of more married than unmarried people owning private health insurance is the explanation for why married people have a greater health status than unmarried people. Health insurance coverage is an indicator of health care-seeking behaviour, which goes to the core of married people's willing to address health concerns owing to their recognition of the family (ie children and spouse) depending on them for care, protection and financial support. According to Moore et al. (1997, 29), people who reside with a spouse have a different base of support that those in other social arrangements (See also Smith & Waitzman 1994; Lillard & Panis 1996). Cohen & Wills (1985) found that perceived support from one's spouse increased wellbeing (see also Smith & Waitzman 1994), while Ganster et al. (1986) reported that support from supervisors, family members and friends was related to low health complaints. Koo, Rie & Park (2004) findings revealed that being married was a 'good' cause for an increase in psychological and subjective wellbeing in old age. Smith & Waitzman(1994) offered the explanation that wives found dissuade their husband from particular risky behaviours such as the use of alcohol and drugs, and would ensure that they maintain a strict medical regimen coupled with proper eating habit (see also Ross et al., 1990; Gore, 1973). In an effort to contextualize the psychosocial and biomedical health status of particular marital status, one demography cited that the death of a spouse meant a closure to daily communicate and shared activities, which sometimes translate into depression that affect the wellbeing more of the elderly who would have had investment must in a partner (Delbés & Gaymu 2002, p. 905).

Embedded in Smith and Waitzman finding is the positive effecting of marriage on men's health status. This speaks to culture of men's unwillingness to seek medical care, and the role of the spouse in reducing this practice. The current study found that men were 19.2% less likely than women own health insurance, indicating once again their unwillingness to seek medical care. Health literature has established that women are more likely to seek medical care than men (Stekelenburg et al., 2009; PIOJ & STATIN, 2001) and that this was concurred by the current study. Interestingly, in 2002, for every 156 females that sought medical care there were 100 males; but in 2007, the ratio widens to 160 females for every 100 males. Although females sought more health care services than males, statistics revealed that the latter group spent more days in illness (mean = 10.3 days) than females (mean number of days suffered from illness = 9.3 days) (PIOJ & STATIN, 2008).

Poor health status which is an indicator of health conditions means that females were more likely to seek medical care to address those concerns compared to males who were suffering from the different illnesses. Of the 3 specified chronic illnesses (arthritis, diabetes mellitus, and hypertension) females are influenced by the more severe types, and thus explain the greater probability of them seeking medical care and buying health insurance coverage than males. This research found that in 2002, females were 2.1 times more likely to report having hypertension and 1.5 times more likely to claim that they have diabetes mellitus than males. In 2007, the disparity in self-reported hypertension fell to 1.7 times and increased to 2 times for diabetes mellitus. For arthritis, the disparity was narrowly greater for males than females. In 2002, for every 120 males that reported arthritis there were 100 females and this was 111 males for every 100 females in 2007.

Men are not only unwilling culturally to display emotions, fear, weakness and illness, they are equally reserved about speaking of their health conditions. Such a position is embedded in the culture, which states that boys should 'suppress reaction to pain' and to speak of illness to lower ones maleness (Chevannes, 2001, p. 37). Chevannes's work explains the current findings as well to provide in-depth information on statistics published in the Jamaica Survey of Living Conditions (JSLC). The JSLC (2000) reported that men were 0.7 times less likely to self-report sicknesses, injuries and/or ailments compared to their female counterparts. In a number of societies, traditional females seek health-care more than males, which allow for a better monitoring and diagnostic assessment of their health conditions as against men.

Higher income means the individual, family, society and nation has more to it disposable to cover non-consumption items such as health insurance. Easterlin argued that "those with higher income will be better able to fulfill their aspiration and, and other things being equal, on an average, feel better off" (Easterlin, 2001a, p. 472), indicating a bivariate relationship between subjective well-being and income. Stutzer & Frey (2003) found that the association between subjective wellbeing and income to be a non-linear one. According to Stutzer & Frey (2003) "In the data set for Germany, for example, the simple correlation is 0.11 based on 12, 979 observations" (p. 9). The current study concur with Easterlin that greater income can purchase other goods, which accounts for the positive correlation between income and private health insurance coverage. This is also in keeping with Brown et al.'s study (2008) which had income as a predictor of health care-seeking behaviour. The current research went further than Brown et al (2008) and Easterlin (2001) studies as it found that those who consume more on food and non-food items are more likely to own Health insurance coverage than those who consume less. Hence, it is expected that wealthy will be significantly more likely to own Health insurance coverage than the poor.

In Jamaica, statistics from the Planning Institute of Jamaica and Statistical Institute of Jamaica (2007) revealed that poverty is substantially a rural phenomenon and that the more of the wealthy live in urban area, then more urban dwellers having Health insurance coverage is reinforcing the literature that more money provide access to a wider spread of goods and services outside of basic necessities. The current research has provided more interest information in the literature as wide gap that existed in 2002 between the wealthy and the poor in regards to ownership of private health insurance, narrowed in 2007.

Another interesting finding of this study is the positive significant correlation between health insurance coverage and educational attainment. In 2002, those with tertiary level education were 19 times more likely to own health insurance coverage in Jamaica and this narrowed substantially to 1.4 times more than those with primary and below education. The narrowing of the gap of those who owned health insurance coverage between the tertiary and the primary level education can due to knowledge of ill-health, lowered income, the role of the media in information the populace about the role of health insurance coverage in reducing medical cost on seeking health care. Interestingly private health insurance companies in Jamaica have expanded health insurance schemes to Credit Unions, and so this is giving greater access of this product to the poor who are mostly members of the Union.

The positive significant correlation of age and health insurance coverage in Jamaica can be accounted for by the biological changes and the high cost of medical care due to this futuristic probability. Organism aged naturally, which explains biological ageing. Ageing is synonymous with reduced functional limitations (or increased health conditions), suggesting that the older people become they will be more willing to purchase Health insurance coverage due to the future cost of medical care and the high likeliness of illness because of health conditions. Gompertz's law in Gavriolov & Gavrilova (2001) showed that there is fundamental quantitative theory of ageing and mortality of certain species (the examples here are as follows – humans, human lice, rat mice, fruit flies, and flour beetles (see also, Gavriolov & Gavrilova, 1991). Gompertz's law went further to establish that human mortality increase twofold with every 8 years of an adult life, which means that ageing increases in geometric progression. This phenomenon means that human mortality increases with age of the human adult, but that this becomes less progress in advance ageing. Thus, biological ageing is a process where the human cells degenerate with years (i.e. the cells die with increasing in age), which is well established in evolutionary biology (Medawar 1946; Carnes and Olshansky, 1993; Carnes et al., 1999; Charlesworth, 1994).

A study on the elderly in the Caribbean Food and Nutrition Institute's magazine *Cajanus* found that 70% of individuals who were patients within different typologies of health services in Jamaica were senior citizens (Caribbean Food and Nutrition Institute 1999; Anthony 1999), and this emphasize the need of elderly to purchase health insurance in order to cover the cost of health care. A study conducted by Costa, using secondary data drawn from the records of the Union Army (UA) pension programme that covered some 85% of all UA, showed there is an association between chronic conditions and functional limitation – which include difficulty walking, bending, blindness in at least one eye and deafness (Costa 2002). Again this is reiterating the need to seek medical care owing to ageing, and justifying the positive correlation between age and health insurance coverage in this study.

Interestingly health insurance is among the greatest predictor of health care-seeking

behaviour in the United States (Call & Ziegenfuss, 2007), and this is not the case in Jamaica as only 21 out of every 100 Jamaicans possessed health insurance coverage in 2007. However of those who claimed to have private health insurance coverage, 8 out of 10 visited health care facilities, suggesting that those with this facility would be a great predictor of health care-seeking behaviour. It should be noted that Jamaica does not have a national health insurance coverage which is opened to the general populace. Instead (in 2007), the government introduced a national health insurance coverage in which people with particular ailments can access services and medication at particular public institutions free and a national health insurance scheme which caters to the elderly Jamaicans (ages 60 years and older).

### **Conclusion**

The socioeconomic determinants of Health insurance coverage in Jamaica have expanded in 2007 over 2002. Area of residence, consumption, income, educational attainment, marital status and social support have remained factors in 2007 over 2002; but age, gender and social class are currently new sociodemographic variables that explain private health insurance in Jamaica. Furthermore, females seeking more medical care in Jamaica has been fundamentally linked to culture and this is undoubtedly so; but this study has found that the typology of their health conditions is another pivotal rationale for this disparity. The reported health conditions with which males reported more of than females are illnesses that can be substantially over the counter with non-traditional medicine, and so further goes to the reason for their low access of traditional health care services.

In Jamaica, the employment typology in area of residents is different and contributes to the disparity in private health insurance coverage. Employment in rural area is substantially self-employment (ie farming) and this type of employment is not designed around private health insurance coverage. Health insurance coverage is more structured for employed people who are in the private or public sectors more within urban and other towns than rural areas indicating that rural residents, who are faced high poverty and self-employment, will be more likely in continuing their choice in home remedy or non-traditional medicine in order to address their ill-health. Health which is strongly correlated with income means that poor individuals, families, societies, nations, will be less healthy and will need assistance in the form of health insurance to be able to reduce mortality. In concluding, the information with which this provided can be used by public health services in formulating programmes that can address the concerns of males and rural poor.

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Table 1: Demographic characteristic of samples 2002 and 2007

Variable	2002		2007	
	Number	Percent	Number	Percent
<b>Gender</b>				
Male	12,332	49.3	3,303	48.7
Female	12,675	50.7	3,479	51.3
<b>Area of residence</b>				
Urban	3,357	13.4	2,002	29.5
Other	6,401	25.6	1,458	21.5
Rural	15,260	61.0	3,322	49.0
<b>Illness</b>				
Yes	3,010	12.5	980	14.9
No	21,103	87.5	5,609	85.1
<b>Visits health care facilities</b>				
Yes	1,966	63.9	658	65.5
No	1,113	36.1	347	34.5
<b>Social class</b>				
Poor	9,931	39.7	2,697	39.4
Middle	4,984	19.9	1,351	19.9
Upper	10,099	40.0	2,734	40.3
<b>Private health insurance coverage</b>				
Yes	2,671	11.0	1,314	20.2
No	21,546	89.0	5,203	79.8
<b>Health status</b>				
Good			5,397	82.2
Fair			848	12.9
Poor			320	4.9

Table 2: Income, crowding, age, by area of residence 2002 and 2007

Characteristic	Year	Category	Mean	SD	p-value
Income Ja\$	2002†	Urban	440,4521	\$521,519.38	<0.001
		Other towns	385,626	\$276,644.12	
		Rural	284,810	\$231,540.04	
		Total	331,488	\$304,040.77	
	2007††	Urban	865,674	\$673,512.10	<0.001
		Other towns	771,301	\$597,582.65	
		Rural	551,634	\$389,765.68	
		Total	691,560	\$128,742.65	
Crowding (persons)	2002	Urban	2.0	1.4 persons	0.097
		Other towns	2.0	1.4 persons	
		Rural	2.0	1.4 persons	
		Total	2.0	1.4 persons	
	2007	Urban	4.3	2.4 persons	<0.001
		Other towns	4.6	2.3 persons	
		Rural	5.0	2.5 persons	
		Total	4.7	2.5 persons	
Age (years)	2002		28.2	22.0	
	2007		29.9	21.8	
No of visits to health care facilities (days)	2002		1.7	1.4	
	2007		1.4	1.1	
Medical expenditure Ja\$	2002†		1,144	2,946	
	2007††		1,477	4,711	

†Ja \$40.97 = US \$1.00

††Ja \$80.47 = US \$1.00

Table 3: Health status by self-reported illness, and gender 2007

Characteristic	Category	Health status (%)			Total no.
		Good	Fair	Poor	
Self-reported dysfunction	0	89.1	8.7	2.2	5569
	≥ 1	42.8	36.8	20.4	976
	Total	5381	845	319	6545
Gender	Males	85.4	10.4	4.2	3195
	Females	79.2	15.3	5.5	3370
	Total no.	5397	848	320	6565

Table 4: Self-reported diagnosed recurring illness by gender and years 2002 and 2007

Year	Sex	Self-reported diagnosed recurring illness (%)								Total no.
		Cold	Diarrhoea	Asthma	Diabetes	Hyper-tension	Arthriti s	Other	No	
2002	Males	22.9	3.1	11.4	9.3	12.9	7.6	20.1	12.5	1252
	Females	17.8	2.4	8.3	13.2	27.6	6.3	16.6	7.7	1811
	Total no.	610	83	294	356	661	209	553	297	3063
2007	Males	17.2	2.7	11.7	7.7	14.4	6.0	25.4	14.9	402
	Females	13.4	2.7	8.0	15.4	24.8	5.4	22.1	8.2	597
	Total no	149	27	95	123	206	56	234	109	999

Table 5: Medical care-seeking behaviour by gender, 2002, 2007

Medical care-seeking behaviour	2002		2007	
	Male	Female	Male	Female
Yes	60.7	66.0	62.3	67.6
No	39.3	34.0	37.7	32.4
Total no.	1266	1813	406	599

Table 6: Health insurance coverage by area of residence 2007

Health Insurance	Area of residence			Total no.
	Urban	Other towns	Rural	
No coverage	72.0	77.9	85.5	79.8
Private coverage	19.2	15.1	7.1	12.4
Public coverage	8.7	7.0	7.4	7.7
Total no.	1939	1401	3177	6517

Table 7: Logistic regression: Predictors of private health coverage in Jamaica

Characteristic	2002		2007	
	OR	95% CI	OR	95% CI
<b>Age</b>	1.00	0.98-1.02	1.01	1.01-1.02
<b>Log consumption</b>	1.90	1.12-3.23	1.00	1.00-1.00
<b>Log income</b>	1.71	1.02-2.87	1.00	1.00-1.00
<b>Log medical expenditure</b>	0.99	0.81-1.21	1.00	1.00-1.00
<b>Household head</b>	4.61	0.21-99.16	1.03	0.86-1.23
<b>Medical care seeking behaviour</b>	0.88	0.42-1.83	1.65	1.07-2.41
<b>Sex</b>				
Male	0.88	0.60-1.30	0.81	0.69-0.95
<b>Marital status</b>				
Separated, divorced or widowed	1.38	0.49-3.88	1.19	0.87-1.64
Married	3.91	2.47-6.20	1.84	1.52-2.22
†Never married	1.00		1.00	
<b>Area of residence</b>				
Urban	2.24	1.23-4.09	1.30	1.08-1.57
Other towns	1.19	0.75-1.89	1.11	0.90-1.36
†Rural	1.00		1.00	
<b>Education</b>				
Secondary	2.97	1.46-6.00	1.45	1.09-1.92
Tertiary	18.8	8.11-43.4		
†Primary or below	1.00		1.00	
<b>House tenure: owned</b>	1.76	0.16-19.4		
<b>Social class</b>				
Middle	0.88	0.32-2.41	0.96	0.63-1.46
Upper	1.88	0.68-5.24	1.61	1.04-2.49
†Lower	1.00		1.00	
<b>Social support</b>	0.54	0.36-0.80	1.33	1.04-1.70
<b>Health status</b>				
Good health	0.93	0.56-1.53	1.05	0.84-1.31
<b>Durable goods index (excluding land)</b>	1.09	1.01-1.17		
<b>Physical environment</b>	0.78	0.48-1.27		
<b>Crime index</b>	1.01	0.99-1.03		
<b>Asset ownership (ie land or property)</b>	0.79	0.51-1.22		
<b>Psychological condition</b>				
Negative affective conditions	0.96	0.91-1.02		
<b>Log crowding</b>	1.33	0.88-2.02	1.07	0.98-1.16
<b>Social welfare</b>			0.79	0.52-1.20
<b>Time spent in health care facilities</b>				
Public	0.96	0.79-1.20	1.00	1.00-1.00
Private	1.43	0.02-85.3	1.00	1.00-1.00
<b>Illness</b>	4.01	0.44-36.4	1.14	0.90-1.43
<b>Injury</b>	0.68	0.36-1.75	1.12	0.57-2.20
N		25,007		6,565
Chi <sup>2</sup>		451.3		590.1
Nagelkerke R <sup>2</sup>		0.45		0.49
LR		776.4		4,126.8