

Original Article

Impact of poverty, not seeking medical care, unemployment, inflation, self-reported illness, and health insurance on mortality in Jamaica

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Abstract

Background: An extensive review of the literature revealed that no study exists that has examined poverty, not seeking medical care, inflation, self-reported illness, and mortality in Jamaica. The current study will bridge the gap by providing an investigation of poverty; not seeking medical care; illness; health insurance coverage; inflation and mortality in Jamaica. **Materials and Method:** Using two decades (1988-2007), the current study used three sets of secondary data published by the (1) Planning Institute of Jamaica and the Statistical Institute of Jamaica (Jamaica Survey of Living Conditions) (2) the Statistical Institute of Jamaica (Demographic Statistics) and (3) the Bank of Jamaica (Economic Report). Scatter diagrams were used to examine correlations between the particular dependent and independent variables. For the current study, a number of hypotheses were tested to provide explanation mortality in Jamaica. **Results:** The average percent of Jamaicans not seeking medical care over the last 2 decades was 41.9%; and the figure has been steadily declining over the last 5 years. In 1990, the most Jamaicans who did not seek medical care were 61.4% and this fell to 52.3% in 1991; 49.1% in 1992 and 48.2% the proceeding year. Based on the percentages, in the early 1990s (1990-1994), the percent of Jamaicans not seeking medical care was close to 50% and in the latter part of the decade, the figure was in the region of 30% and the low as 31.6% in 1999. In 2006, the percent of Jamaicans not seeking medical care despite being ill was 30% and this increased by 4% the following year. Concomitantly, poverty fell by 3.1 times over the 2 decades to 9.9% in 2007, while inflation increased by 1.9 times, self-reported illness was 15.5% in 2007 with mortality averaging 15,776 year of the 2 decades. There is a significant statistical correlation between not seeking medical-care and prevalence of poverty ($r = 0.759$, $p < 0.05$). There is a statistical correlation between not seeking medical care and unemployment; but the association is a non-linear one. The relationship between mortality and unemployment was an unsure one, with there being no clear linear or non-linear correlation. The findings revealed that there is a strong direct association between not seeking medical care and inflation rate ($r = 0.752$). A strong negative statistical correlation was found between mortality and prevalence of poverty ($r = -0.717$). There is a non-linear statistical association between not seeking medical care and illness/injury. **Conclusions:** Not seeking medical care is not a good indicator of premature mortality; but that this percentage must be excess of 55%. While this study cannot confirm a clear rate of premature mortality, there are some indications that this occurs beyond a certain level of not seeking care for illness. (Bourne PA. Impact of poverty, not seeking medical care, unemployment, inflation, self-reported illness, health insurance on mortality in Jamaica. *North Am J Med Sci* 2009; 1: 99-109).

Keywords. Not seeking medical care, self-reported illness, poverty, health insurance, mortality, Jamaica.

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Introduction

Health (medical) care-seeking behaviour of people is not only an indicator of their willingness to preserve life but it is crucial to personal, societal and national development. The health of an individual affects all area of his/her life and extends to the family, community, society and the nation. The cost of ill-health is not only borne by the individual; but the entire society. Ill-health means less time on the job; lowered production and productivity; reduced Gross Domestic Product and savings; high health care expenditure; switching

of expenditure from education and other social development to health care; and this can further increase poverty for an individual or his/her family. Health therefore holds a key to social and economic development. Hence, long life must be supported by a healthy individual or population. It is this interrelationship among health, life expectancy, social and economic development that account for a demand in health care services.

Life expectancy is computed from mortality data, and so healthy life expectancy means the delaying of mortality.

Mortality statistics provides an insight into morbidity patterns as well as the health of a person or a population. It also provides a basis upon which we can estimate the burden of premature deaths [1, 2]; lifestyle practices; and health care-seeking behaviour [3]. The Caribbean is experiencing health transition which accounts for reduction in fertility and mortality, and the changing pattern of diseases from

communicable to non-communicable disease as the leading cause of death [2, 4]. The Caribbean is not atypical in regards to aforementioned pattern as the [1] argued that 80% of chronic disease deaths occur in low-to-middle income countries, and that this has a serious influence on the causes of premature mortality.

Table 1 Annual Inflation in Food and Non-Alcoholic beverages and Health Care Cost, 2003-2007

| | Food and Non-Alcoholic beverage | Health Care Cost |
|------|---------------------------------|------------------|
| 2002 | 7.8 | 5.2 |
| 2003 | 10.0 | 9.7 |
| 2004 | 13.7 | 6.4 |
| 2005 | 11.7 | 7.5 |
| 2006 | 5.0 | 9.7 |
| 2007 | 24.7 | 3.4 |

Source: Planning Institute of Jamaica, Economic and Social Survey of Jamaica, various issues

Note: Inflation is measure using point-to-point at the end of the year (December to December).

Statistics from the Planning Institute of Jamaica and the Statistical Institute of Jamaica published in the Jamaica Survey of Living Conditions [5] revealed that in 2007, 15.5% of Jamaicans reported an illness/injury compared 9.7% in 1997. Of the 15.5% of Jamaicans who reported health conditions, 66% of them sought medical care. Of those who sought health care, 40.5% went to public facilities compared to 51.9% who attended private health care facilities. Interestingly the typologies of diseases were asthma (8.7%); diabetes mellitus (12%); hypertension (22.4%); and arthritis (8.8%). Concomitantly, 33.9% of Jamaicans who did not seek care reported that they were unable to afford it; 30.2% mentioned that they preferred home remedy and 6.0% remarked that they had no time. According to Fraser [6], the prevalence of hypertension in the Caribbean was 28% and 55% for those over 25 years and 40 years respectively. This explains Fraser's call for an aggressive management drive to address the prevention of those health conditions, which was equally echoed by other scholars [7, 8].

Morrison [9] 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 [10] at the 6th International Diabetes and Hypertension Conference, which was held in Jamaica in March 2000. They found that there is a positive association between diabetic and hypertensive patients - 50% of individuals with diabetes had a history of hypertension [10]. Prior to those scholars' work, Eldemire [11] finds that 34.8% of new cases of diabetes and 39.6% of hypertension were associated to senior citizens (i.e. ages 60 and over). A national study of 958 Jamaicans found that 18% of women had hypertension compared to 8% of men; 4.8% of women

with diabetes compared to 3.3% of men [4]; and an earlier study by Forrester et al [8] had found that 19.3% of African-Jamaican females reported hypertension compared to 13.0% of African-Jamaican males.

When the WHO [1] argued that some deaths are premature, a part of this answer lies in health care-seeking behaviour; time of treatment; identification of illness; poverty; inaccessibility; unhealthy lifestyle practices; and physical inactivity. According to WHO [1], one-half of all chronic diseases occur prematurely in people who are below the age of 70 years compared to one quarter of those younger than 60 years. The organization also reported that 80% of premature heart disease, stroke and diabetes mellitus could have been prevented from happening. Can premature deaths be prevented from happening?

Embedded in WHO publication is the relationship between poverty and illness, poverty and chronic diseases and poverty and premature death. Marmot [12] explained that income is positively associated with better health, and that poverty means poor nutrition; inadequate physical milieu, and poor water and food supply which account for increased ill-health in this cohort. Like Marmot [12], Sen [13,14] argued that poverty denotes reduced capability as this retard choices; freedom; educational access; proper nutrition; and therefore justifies not only chronic diseases but also employability; health insurance coverage; and medical care-seeking behaviour. Statistics from the Planning Institute of Jamaica and the Statistical Institute of Jamaica [5] revealed that those below the poverty line sought the least medical care: 51.7% for those below the poverty line; 52.7% for those just above the poverty line; 61.2% for those in the middle income

categorization; 61.8% in the wealthy income category and 67.6% of those in the wealthiest income cohort. Concomitantly, the poorest income category had the highest reported illness (85.4%) compared to 85.1%; 79.6%; 67.5%; and 74.3% for poor, middle class, wealth and wealthiest income category respectively [5].

Table 2. Inflation, Public-Private Health Care Service Utilization, Incidence of Poverty, Illness and Prevalence of Population with Health Insurance (in per cent), 1988-2007

| Year | Inflation | Public Utilization | Private Utilization | Prevalence of poverty | Illness | Health Insurance Coverage | Seeking Medical Care | Mean Days of Illness |
|------|-----------|--------------------|---------------------|-----------------------|---------|---------------------------|----------------------|----------------------|
| 1988 | 8.8 | NI | NI | NI | NI | NI | NI | NI |
| 1989 | 17.2 | 42.0 | 54.0 | 30.5 | 16.8 | 8.2 | 54.6 | 11.4 |
| 1990 | 29.8 | 39.4 | 60.6 | 28.4 | 18.3 | 9.0 | 38.6 | 10.1 |
| 1991 | 80.2 | 35.6 | 57.7 | 44.6 | 13.7 | 8.6 | 47.7 | 10.2 |
| 1992 | 40.2 | 28.5 | 63.4 | 33.9 | 10.6 | 9.0 | 50.9 | 10.8 |
| 1993 | 30.1 | 30.9 | 63.8 | 24.4 | 12.0 | 10.1 | 51.8 | 10.4 |
| 1994 | 26.8 | 28.8 | 66.7 | 22.8 | 12.9 | 8.8 | 51.4 | 10.4 |
| 1995 | 25.6 | 27.2 | 66.4 | 27.5 | 9.8 | 9.7 | 58.9 | 10.7 |
| 1996 | 15.8 | 31.8 | 63.6 | 26.1 | 10.7 | 9.8 | 54.9 | 10.0 |
| 1997 | 9.2 | 32.1 | 58.8 | 19.9 | 9.7 | 12.6 | 59.6 | 9.9 |
| 1998 | 7.9 | 37.9 | 57.3 | 15.9 | 8.8 | 12.1 | 60.8 | 11.0 |
| 1999 | 6.8 | 37.9 | 57.1 | 16.9 | 10.1 | 12.1 | 68.4 | 11.0 |
| 2000 | 6.1 | 40.8 | 53.6 | 18.9 | 14.2 | 14.0 | 60.7 | 9.0 |
| 2001 | 8.8 | 38.7 | 54.8 | 16.9 | 13.4 | 13.9 | 63.5 | 10.0 |
| 2002 | 7.2 | 57.8 | 42.7 | 19.7 | 12.6 | 13.5 | 64.1 | 10.0 |
| 2003 | 13.8 | NI | NI | 19.1 | NI | NI | NI | NI |
| 2004 | 13.7 | 46.3 | 46.4 | 16.9 | 11.4 | 19.2 | 65.1 | 10.0 |
| 2005 | 12.6 | NI | NI | 14.8 | NI | NI | NI | NI |
| 2006 | 5.7 | 41.3 | 52.8 | 14.3 | 12.2 | 18.4 | 70.0 | 9.8 |
| 2007 | 16.8 | 40.5 | 51.9 | 9.9 | 15.5 | 21.2 | 66.0 | 9.9 |

Source: Bank of Jamaica, Statistical Digest, Jamaica Survey of Living Conditions, Economic and Social Survey of Jamaica, various issues

Note: Inflation is measured point-to-point at the end of each year (December to December), based on Consumer Price Index (CPI)

NI – No Information Available

The poor not only seek less medical care; and this offers some more explanation for their increased probability of contracting chronic illness and other mortality causing morbidities; but they are least likely to purchase health insurance coverage. Poverty means in measurable terms inaffordability from material and other social resources, which explains the low likeliness to purchase food and other vital non-food items. In 2007, statistics on Jamaica revealed that 2.2% of those below the poverty line had health insurance coverage compared to 10.1% of those just above the poverty line; 15.9% of the middle class; 20.9% of the wealthy and 37.7% of the wealthiest income category [5]. This finding highlights the reality of the poor; that in order for them to access health care, this is substantially an out of pocket payment or that it has to state funded. With the probability that they are least likely to find out of pocket money to utilize on health care, premature mortality indeed will be greater for this cohort than other income cohorts.

Poverty therefore erodes good health status of a populace and further deepens individual and national poverty while

creating a public health concern for the society. Inflation is a persistent upward movement in prices. It erodes the socio-economic choices of people within a society. Inflation increases the prices of goods and services and a part of this consequence is the cost of health care. In 2007, the annual rate of inflation on food and non-alcoholic beverages was 24.7% compared to 3.4% on health care cost (Table 1), while it was 16.8% for the nation. The rate of the increase of inflation for 2007 over 2006 was 194.7%. With increases in food prices comes the upward price movement in other goods and services prices and such reality removes the willingness of people from seeking medical care as their priority would be to spend on food rather choosing to spend on medical care. The information above highlights the interconnectedness between poverty, unemployment, ill-health; not seeking medical care; health insurance coverage and mortality. In spite of this reality, extensive review of the literature has not found a study that has examined the aforementioned variables in a single research. The current study will bridge the gap by providing an investigation of poverty; not seeking medical care; illness; health insurance coverage; inflation and

mortality in Jamaica.

Using two decades of data (1988-2007), the current work will examine 10 hypotheses and provide an extensive account for mortality; not seeking medical care; illness; health insurance coverage and unemployment patterns in Jamaica in an attempt to provide research literature for future public health planning and a better understanding of mortality and premature mortality in Jamaica. The hypotheses are 1) there is a statistical correlation between not seeking medical care and poverty; 2) there is a statistical association between not seeking medical care and unemployment; 3) there is a statistical association between poverty and unemployment; 4) there is a statistical relationship between poverty and inflation; 5) there is a statistical association between not seeking medical care and illness; 6) there is a statistical association between not seeking medical care and health insurance coverage; 7) there is a statistical association between mortality and poverty; 8) there is a statistical relationship between mortality and unemployment, 9) there is a statistical relationship between mortality and not seeking medical care, and 10) there is a significant statistical association between not seeking medical care and inflation.

The aim of this study was to examine the impact of poverty, not seeking medical care, unemployment, inflation, self-reported illness, health insurance coverage on mortality in Jamaica in order to provide public health practitioners and health promotion specialists with research findings on those matters in Jamaica.

The current findings revealed significant statistical correlation between not seeking medical-care and 1) prevalence of poverty ($r = 0.759$, $p < 0.05$); 2) unemployment; 3) inflation ($r = 0.752$); 4) illness; 5) health insurance coverage; and mortality. There is a positive correlation between prevalence of poverty and unemployment ($r = 0.69$), with 48% of poverty able to be explained by unemployment. A strong positive statistical correlation was found between poverty and inflation ($r = 0.856$), as 73.2% of poverty can be explained by inflation. A strong negative statistical correlation was found between mortality and prevalence of poverty ($r = 0.717$), with 51.4% of the variance in mortality can be explained by poverty. The relationship between mortality and unemployment was an unsure one, with there being no clear linear or non-linear correlation. Linear associations were found between most of the aforementioned variable; however, non linear correlations were found between 1) mortality and not seeking-medical care; 2) mortality and unemployment; 3) not seeking medical-care and health insurance coverage; not seeking medical-care and illness; and 4) not seeking-medical care and unemployment.

Materials and Methods

Using two decades (1988-2007), the current study used three sets of secondary data published by the 1) Planning Institute of Jamaica and the Statistical Institute of Jamaica (Jamaica

Survey of Living Conditions); 2) the Statistical Institute of Jamaica (Demographic Statistics); and 3) the Bank of Jamaica (Economic Report). The years selected for this paper is due to the availability of data on health care seeking behaviour; and illness.

Health care-seeking behaviour, poverty and illness data were taken from the Jamaica Survey of Living Conditions. The Jamaica Survey of Living Conditions (JSLC) is conducted jointly by the Planning Institute of Jamaica and the Statistical Institute of Jamaica. Its purpose is to collect data on living standards of Jamaicans. The JSLC used a detailed questionnaire to collect data from respondents between April and October each year. A self-administered questionnaire was used to collect the data which were stored and analyzed using SPSS for Windows 16.0 (SPSS Inc; Chicago, IL, USA). 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 questionnaire covered areas such as socio-demographic, economic and health variables. The non-response rate for the survey was 26.2%.

The survey was drawn using stratified random sampling. This design was a two-stage stratified random sampling design where there was a Primary Sampling Unit (PSU) and a selection of dwellings from the primary units. The PSU is an Enumeration District (ED), which constitutes of a minimum of 100 dwellings in rural areas and 150 in urban areas. An ED is an independent geographic unit that shares a common boundary. This means that the country was grouped into strata of equal size based on dwellings (EDs). Based on the PSUs, a listing of all the dwellings was made, and this became the sampling frame from which a Master Sample of dwelling was compiled, which in turn provided the sampling frame for the labour force. One third of the Labour Force Survey (i.e. LFS) was selected for the survey. The sample was weighted to reflect the population of the nation. Furthermore, the instrument is posted on the World Bank's site to provide information on the typologies of question (<http://www.worldbank.org/html/prdph/lms/country/jm/docs/JAM04.pdf>).

Unemployment data were taken from the publication of the Labour Force Survey of Jamaica (conducted by the STATIN).

Mortality data were taken from the publication of the demographic statistics. Although a medical certificate of death is used to indicate mortality, data from the Registrar General Department (RGD) were cleaned, modified and validated by the Statistical Institute of Jamaica [15]. Using a study that was conducted in 1999 which showed that there was under-registration of deaths in RGD's figures, the STATIN developed a methodology that accounted for complete mortality.

For the period 1998-2001, STATIN subtracted the number of deaths as reported by the police (deaths from external causes)

from the RGD's record on external deaths. The difference was added to the mortality data set. Secondly, on investigation of the infant mortality (ages below 1 year), STATIN found that 80.25 percent of the deaths occurs in the year in question and 19.75 years in the previous year. This

was taken into consideration with the RGD's figures in order to account for all deaths occurring in the year in question. For a more detailed explanation of this methodology, readers can consult Demographic Statistics [15].

Table 3 Seeking medical care, self-reported illness, and gender composition of those who report illness and seek medical care in Jamaica (in percentage), 1988-2007.

| Year | Mortality | Unemployed | SMC | | RI | | Mean Days of Illness | |
|------|-----------|------------|------|-------|------|-------|----------------------|-------|
| | | | Men | Women | Men | Women | Men | Women |
| 1988 | 12,167.0 | 26.8 | NI | NI | NI | NI | NI | NI |
| 1989 | 16400.0 | 18.0 | 44.7 | 52.8 | 15.0 | 18.5 | 10.6 | 11.1 |
| 1990 | 14900.0 | 15.3 | 37.9 | 39.2 | 16.3 | 20.3 | 10.2 | 10.2 |
| 1991 | 13300.0 | 15.3 | 48.5 | 47.4 | 12.1 | 15.0 | 10.0 | 10.3 |
| 1992 | 13200.0 | 9.4 | 49.0 | 52.5 | 9.9 | 11.3 | 10.7 | 10.9 |
| 1993 | 13900.0 | 9.5 | 48.0 | 54.7 | 10.4 | 13.5 | 10.7 | 10.1 |
| 1994 | 13500.0 | 10.9 | 49.0 | 53.4 | 11.6 | 14.3 | 10.3 | 10.4 |
| 1995 | 15400.0 | 9.6 | 59.0 | 58.9 | 8.3 | 11.3 | 10.6 | 10.7 |
| 1996 | 15800.0 | 10.8 | 50.5 | 58.5 | 9.7 | 11.8 | 10.0 | 11.0 |
| 1997 | 15100.0 | 10.6 | 60.0 | 59.3 | 8.5 | 10.9 | 11.0 | 10.0 |
| 1998 | 17000.0 | 10.0 | 57.8 | 62.8 | 7.4 | 10.1 | 11.0 | 11.0 |
| 1999 | 18200.0 | 10.0 | 64.2 | 71.1 | 8.1 | 12.2 | 11.0 | 11.0 |
| 2000 | 17400.0 | 10.2 | 57.4 | 63.2 | 12.4 | 16.8 | 9.0 | 9.0 |
| 2001 | 17800.0 | 10.3 | 56.3 | 68.2 | 10.8 | 15.9 | 9 | 10 |
| 2002 | 17000.0 | 10.6 | 62.1 | 65.3 | 10.4 | 14.6 | 10.0 | 10.0 |
| 2003 | 16699.0 | 17.6 | NI | NI | NI | NI | NI | NI |
| 2004 | 16900.0 | 7.9 | 64.2 | 65.7 | 8.9 | 13.6 | 11.0 | 10.0 |
| 2005 | 17552.0 | | NI | NI | NI | NI | NI | NI |
| 2006 | 16300.0 | 7.0 | 71.7 | 68.8 | 10.3 | 14.1 | 9.7 | 10.0 |
| 2007 | 17000.0 | 6.2 | 62.8 | 68.1 | 13.1 | 17.8 | 10.6 | 9.3 |

Source: Jamaica Survey of Living Conditions, various issues; NI: No Information was available; SMC: Seeking medical care
RI: Reporting illness

Inflation data were taken from Economic Statistics (published by the Bank of Jamaica).

Information is not available on those who are ill but not seeking medical care. As a result this information was computed by subtracting the percentage reported seeking medical care from 100 each year.

The aforementioned data will be used to provide background information on the study. Descriptive statistics and percentage will be presented on mortality; seeking medical care for the population, and males and females.

Scatter diagrams were used to examine correlations between the particular dependent and independent variables. For the current study, a number of hypotheses were tested to provide

explanation mortality in Jamaica. Four hypotheses will be tested in this study: (1) there is a statistical correlation between not seeking medical care and poverty; (2) there is a statistical association between not seeking medical care and unemployment; (3) there is a statistical association between poverty and unemployment; (4) there is a statistical relationship between poverty and inflation; (5) there is a statistical association between not seeking medical care and illness; (6) there is a statistical association between not seeking medical care and health insurance coverage; (7) there is a statistical association between mortality and poverty; (8) there is a statistical relationship between mortality and unemployment, (9) there is a statistical relationship between mortality and not seeking medical care, and (10) there is a significant statistical association between not seeking medical care and inflation.

Measures

Inflation: This is measured as the per cent increase in prices from December to December of each year.

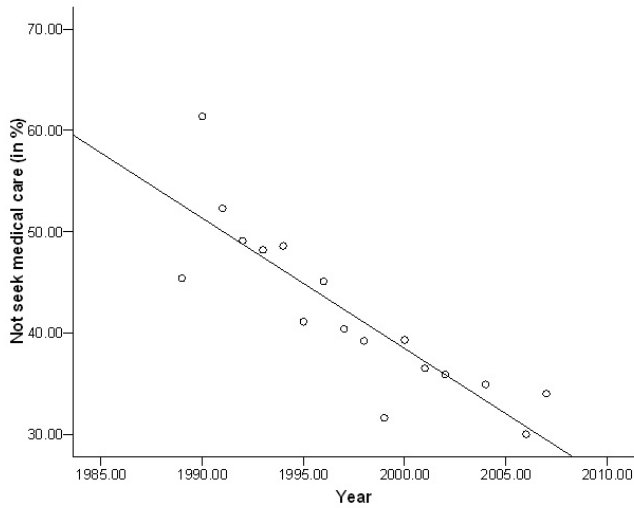


Fig. 1 Not seeking medical care (%) by Year. There is a linear pattern in percent of Jamaicans not seeking medical care.

Not seeking medical care: This variable is the difference between those who reported seeking medical care owing to illness/injury which is expressed as a percent and 100 percent.

Medical care-seeking behaviour: This is the total number of people who reported seeking medical care (i.e. health care practitioner; healer; pharmacist; nurse) (expressed in percent).

Poverty is categorized in two major headings: (1) absolute and (2) relative poverty [13]. Absolute poverty denotes the lack of particular social necessities that is caused by ‘limited material resource’ in which to function – affordability of meeting basic needs, such as adequate nutrition, clothing and housing. Relative poverty, on the other hand, speaks to the individuals’ low financial resources (money or income) or other material resources relative to other people. The Senate says that “relative poverty is defined not in terms of a lack of sufficient resources to meet basic needs, but rather as lacking the resources required to participate in the lifestyle and consumption patterns enjoyed by others in the society” [16].

The Senate Community Affairs Reference Committee (SCARC) ascribes Professor Ronald Henderson the developer of the ‘poverty line’. “...he developed his ‘poverty line’ which was originally set equal to the minimum wage plus child endowment in Melbourne in 1966” [16]. Within this measurement approach, poverty becomes a relative phenomenon instead of an absolutism technique. The SCARC [16] says that, “the aggregate money value of the poverty gap indicates the minimum financial cost of raising all poor families to the poverty line” [16]. The concept of the poverty line is used in Jamaica to evaluate poverty. In 2007,

the poverty line for a household of five was \$302,696.07 compared to \$281,009.93 in 2006 [5].

Results

On average over the period, the percent of Jamaicans not seeking medical care was 41.9%. The number of Jamaicans not seeking medical care has been steadily declining, which indicates that health care-seekers have been increasing over the past 2 decades (Figure 1; Table 2). In 1990, the most Jamaicans who did not seek medical care were 61.4% and this fell to 52.3% in 1991; 49.1% in 1992 and 48.2% the proceeding year. Based on the percentages, in the early 1990s (1990-1994), the percent of Jamaicans not seeking medical care was close to 50% and in the latter part of the decade, the figure was in the region of 30% and the low as 31.6% in 1999. In 2006, the percent of Jamaicans not seeking medical care despite being ill was 30% and this increased by 4% the following year.

Figure 1 showed that not seeking medical care (which is derived by subtracting medical care-seeking behaviour from 100%) can be fitted with a straight line. Furthermore, not seeking medical care has been steadily declining. However, mortality is best fitted with a non-linear curve. It was found that mortality was falling up to 1990 then it reached the minimum then began rising at an increasing rate up to 2002, then an ever-growing declining set in post 2005 (Fig. 2).

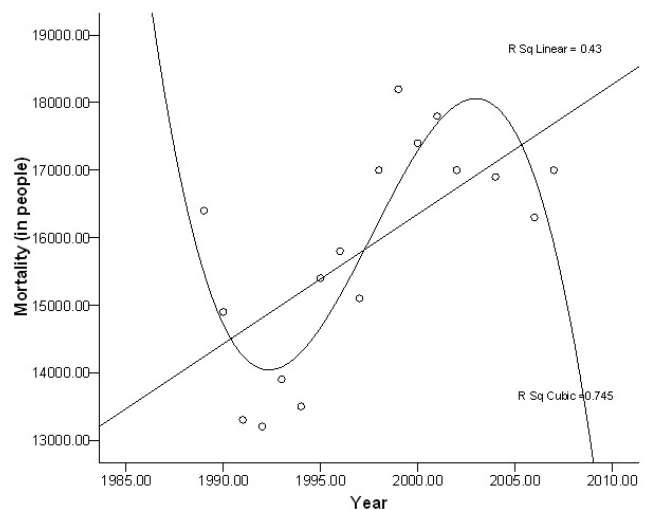


Fig. 2 Annual Mortality in Years. The annual number of Jamaicans who die is best fitted with a non-linear diagram.

Based on findings (Table 2), Jamaicans have a preference for private health care utilization. During the 1990s (1994-1995), the disparity between private and public health care utilization was approximately 40%; which continues to narrow post that period. In 2007, the disparity was 11%, which represents a 28% narrowing of the gap between both utilizations.

Concomitantly, during the latter part of the 1980s to early 1990s, inflation began mounting so much so that it peaked at 80.2% in 1991 (Table 2). While inflation was rising, there were fluctuations between poverty and self-reported illness/injury. Continuing, when inflation was at its highest (80.2%), poverty was also at its peak (44.6%), unemployment was close to the peak (15.3%) (Table 3) and so was the percent of not seeking medical care (52.3%). Inflation increased by 194% in 2007 over 2006 and during that period, health insurance coverage was at its highest (21.2%); medical care-seeking behaviour fell by 4% and self-reported illness increased by 3% (to 15.5%) and 4% more Jamaicans did not seek medical care.

Table 3 revealed that average mortality over the 2 decade period was 15,966 people, which in 1999; the figure was 18,200 people and a low of 13,200 people in 1992. Correspondingly, over the 2 decades it was on one occasion that men sought more medical care than women (2006), with the general trend in the data that men are less likely to report illness/injury. In 2007, the findings revealed that the mean number of days spent in medical care by men was marginally more (10.6 days) compared to women (9.3 days); but that generally the difference is minimal (Table 3).

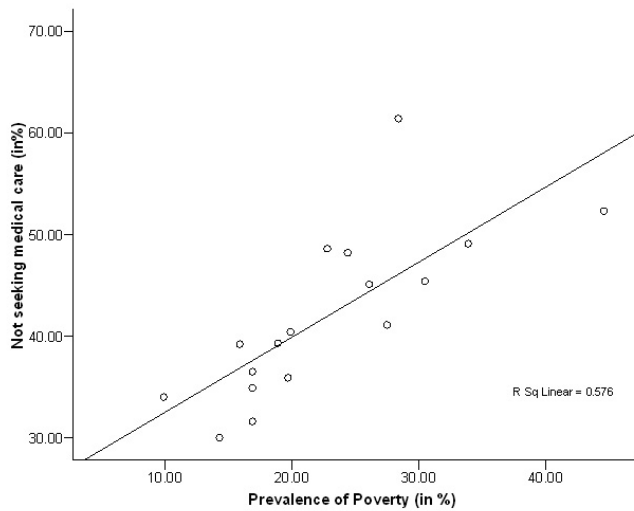


Fig. 3 Not Seeking Medical Care (%) by Prevalence of poverty rate (in %). There is a linear association between not seeking medical care (%) and prevalence of poverty (%) in Jamaica (Fig. 3). Furthermore, 58% of the variability in not seeking medical care (%) can be explained by a 1% change in prevalence of poverty (%).

Not seeking medical-care

There is a significant statistical correlation between not seeking medical-care and prevalence of poverty ($r=0.759$, $p<0.05$). The association therefore is a strong positive one, with 57.6% of the variance in not seeking medical care can be explained by 1% change poverty (Fig. 3).

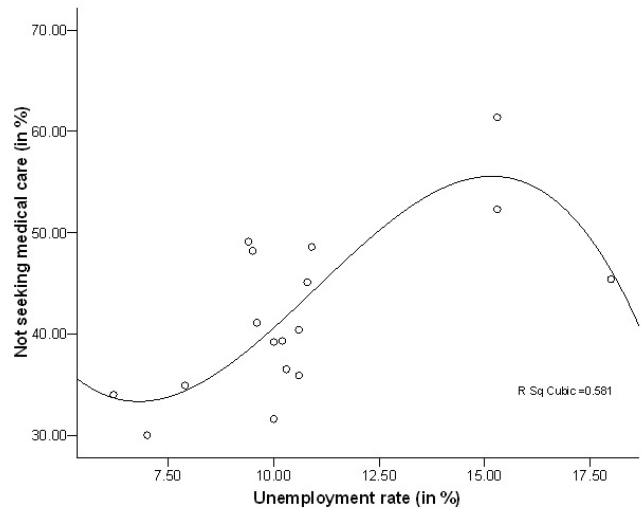


Fig. 4. Not Seeking Medical Care (%) by Unemployment rate (%). The statistical correlation between not seeking medical care (%) and unemployment rate (%) is not a linear one. Based on Figure 4, it is best fitted with a non-linear curve.

There is a statistical correlation between not seeking medical care and unemployment; but the association is a non-linear one (Fig. 4). The findings revealed that there is a direct correlation between not seeking medical care and unemployment between 7.5% and 15% after which it begins to fall. At 15% of unemployment (not clear) not seeking medical care is at its maximum; then post that rate, the rate of not seeking medical care precipitously fall.

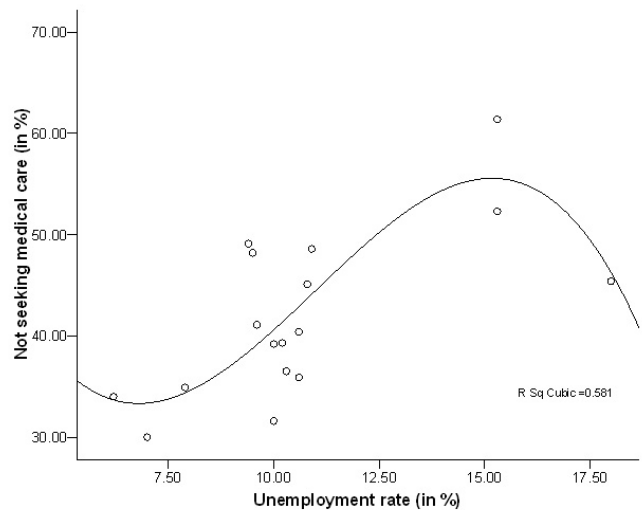


Fig. 5 Not Seeking Medical Care (%) by Illness/Injury (%). Statistical correlation between not seeking medical care (%) and illness/injury (%) is a non-linear one.

The findings revealed that there is a strong direct association between not seeking medical care and inflation rate ($r=0.752$). Continuing, 56.5% of the variance in not seeking medical care can be explained by a 1% change in inflation rate.

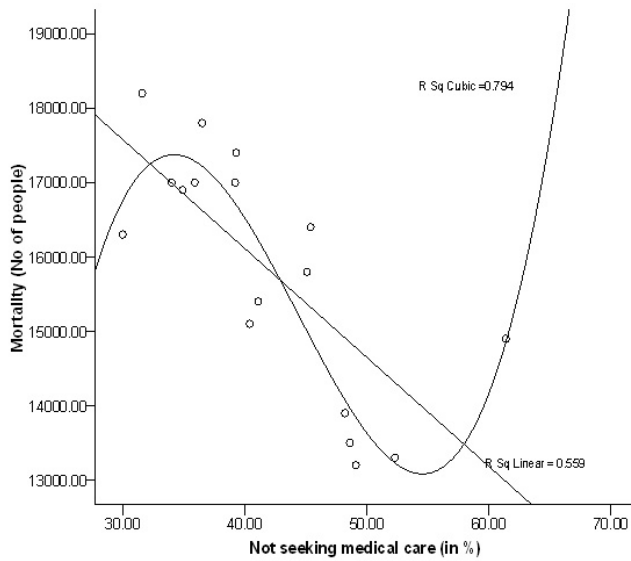


Fig. 6 Mortality (No of people) by Not Seeking Medical Care (%). The association between mortality (number of people that died) and not seeking medical care (%) can be best fitted with a non-linear curve.

There is a non-linear statistical association between not seeking medical care and illness/injury (Fig. 5). The findings revealed that when the rate of illness/injury is more than 9% and less than 14%, the rate of not seeking medical care falls at a decreasing rate and after 15% the rate rises significantly.

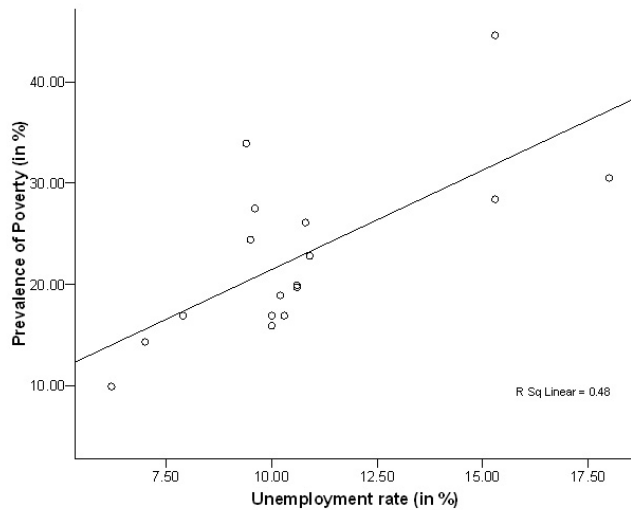


Fig. 7 Prevalence of poverty rate (%) and unemployment rate (%).

Figure 6 revealed a statistical association between not seeking medical care and health insurance coverage; but that the relationship is a non-linear one. It was found that between 8 to 18%, the correlation is an inverse one and after 18% it becomes a direct one. Hence, the more people have health insurance coverage; the less likely that they will not seek medical care and this correlation reverses beyond 18% of coverage.

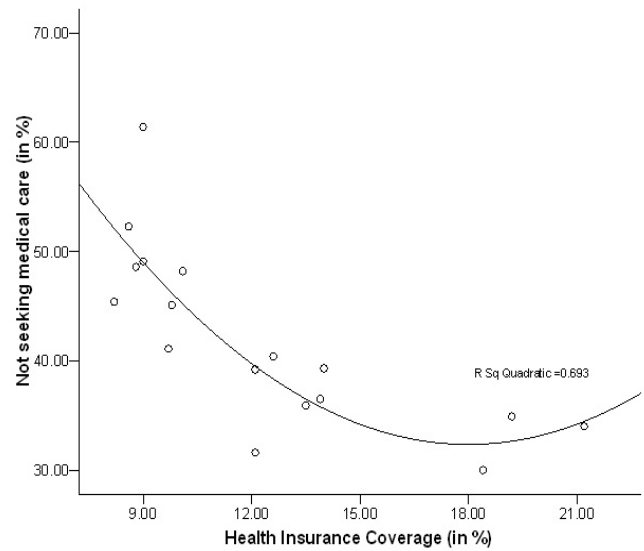


Fig. 8 Not Seeking Medical Care (%) by Health Insurance Coverage (%). A non-linear relationship existed between not seeking medical care (%) and health insurance coverage (%).

There is a statistical relationship between mortality and not seeking medical care. Based on Figure 6, the correlation is best fitted with a non-linear curve than a linear one. Hence, the association does not have the same gradient throughout the curve. It follows that after 35% of not seeking medical care, the rate of change in mortality was decreasing and after 55% of not seeking medical care, the rate begins to mounting at an increasing rate.

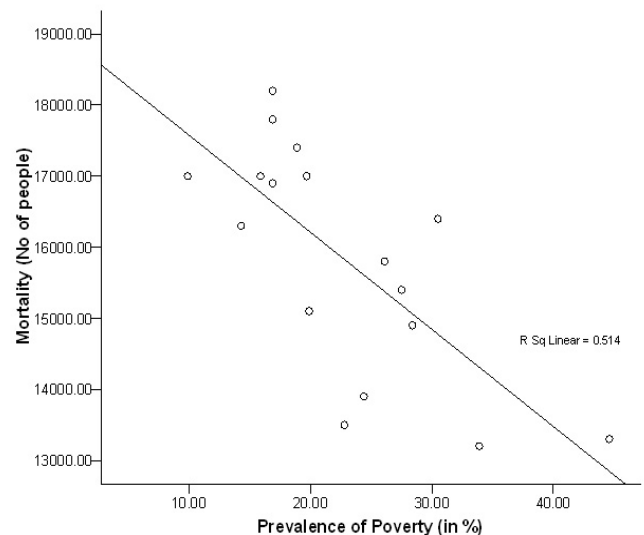


Fig. 9 Mortality (No. of people) by Prevalence of Poverty (%). Mortality (annual number of deaths) and prevalence of poverty (%) is a linear one.

Poverty, Unemployment, Inflation and Mortality

There is a positive correlation between prevalence of poverty and unemployment ($r=0.69$), with 48% of poverty able to be explained by unemployment (Fig. 7).

A strong positive statistical correlation was found between poverty and inflation ($r=0.856$), as 73.2% of poverty can be explained by inflation (Fig. 8).

A strong negative statistical correlation was found between mortality and prevalence of poverty ($r=0.717$), with 51.4% of the variance in mortality can be explained by poverty.

The relationship between mortality and unemployment was an unsure one, with there being no clear linear or non-linear correlation (Fig. 10).

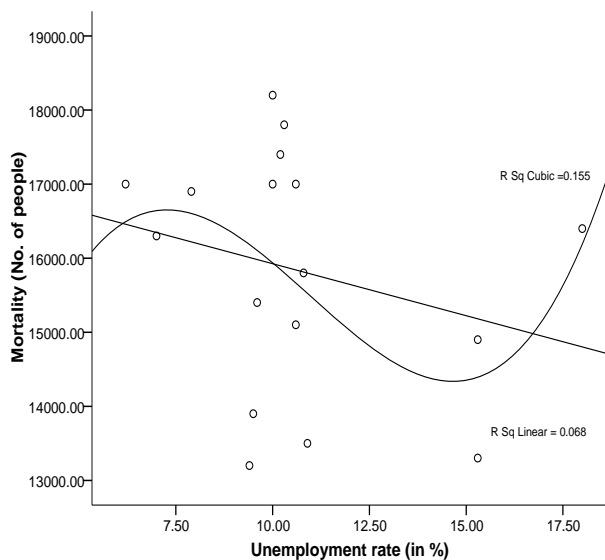


Fig. 10 Mortality by unemployment rate (in%). There is no clear pattern between mortality (number of people who die, annual) and unemployment rate (%) in Jamaica.

Discussion

Murray [18] found that there is a clear interrelation between poverty and health. She noted that financial inadequacy prevents an individual from accessing – food and good nutrition, potable water, proper sanitation, medicinal care, preventative care, adequate housing, knowledge of health practices – and attendance at particular educational institutions among other things, which was in agreement to Marmot and Sen's perspectives. Marmot [12] opined that poverty reduced an individual's socio-economic and political choices and like Sen [13], he saw this phenomenon as a retardation of human capabilities. They believed that poverty accounted for much of the low educational outcome of those that are therein as well as the poor nutrition, low water quality; poor physical environment and that this is not surprising when the poor experience increased health

conditions. Marmot [12] argued that money can buy health as those who have it are able to afford medical care treatment; purchase particular goods; create a good physical milieu and by extension experience a better health status than the poor. This argument is not entirely correct as income cannot buy health, as health is not a commodity that can be purchased. However, income can buy the treatment which is a precursor to better health status; and this is what the wealthy has over the poor and not necessarily better health status. Easterlin [17] argued that material resources have the capacity to improve ones choices, comfort level, state of happiness and leisure; and not that money can buy health or happiness.

Poverty undoubtedly incapacitates those that are therein, which explains why the WHO [1] argued that some of the mortality in this group will be prematurely caused death. The current study found that there is a strong direct correlation between not seeking medical care and poverty. With 57% of reasons Jamaicans do not seek medical care being accounted for by poverty, it follows that some of the morbidities that require medical care will be attended to with home remedy and non-medical healers, and by extension will result in premature deaths. This is concurring with Murray's work which showed that poverty also leads to increased dangers to health: working environments of poorer people often hold more environmental risks for illness and disability; other environmental factors, such as lack of access to clean water, disproportionately affect poor families [18].

The studies clearly show a relationship between persistent and elongated poverty and health and even mortality [18-20]. If poverty is an undisputable a primary cause of malnutrition [21], then access to money plays a pivotal role in the well-being. In order to grasp the severity of the issue of money, we need to be brought into the recognition of poverty and health status. According to Bloom and Canning [22], 'ill-health' significantly affects poor people. This postulate further goes on to explain the higher probability (5 times) of mortality of the poor than the rich [23].

A survey conducted by Diener, Sandvik, Seidlitz and Diener [24], stated that correlation between income and subjective well-being was small in most countries. According to Diener [25], "... there is a mixed pattern of evidence regarding the effects of income on SWB [subjective well-being]". Benzeval, Judge and Shouls [26] study concurred with Diener that income is associated with health status. Benzeval et al went further as their research revealed that a strong negative correlation exists between increasing income and poor health. Furthermore, from a study, it was found that people from the bottom 25 percent of the income distribution self-reported poorer subjective health by 2.4 times than people in the to fifth quintile [26].

The poor like the wealthy or middle class also want long life and a life full of satisfaction; but the reality is, in order for them to spend on education and health care, they must first cover food and non-alcoholic beverage costs. In 2007,

inflation on non-alcoholic beverages was 24.7% which means that the poor must now face the addition cost of survivalability before venturing into health care treatment. In 2003 and 2006, health care cost was close to double digits and in the latter year, the price increase was greater than that for food and non-alcoholic beverages. With the poor experiencing material and income inadequacies, inflation does not only create an economic hardship but a treatment care hindrance. This study revealed that there is a strong positive statistical relationship between not seeking medical care and inflation, which means that when inflation increased by 194% in 2007 over 2006, many poor Jamaicans delayed medical care treatment to their very detriment. It should be noted here that during the aforementioned period, the percentage of Jamaicans reporting health conditions increased to 15.5% (from 12.2% in 2006), suggesting that many poor people were not being treated for some of the chronic diseases that they were experiencing on a daily basis.

One of the ways that is used by many people to afford health care is health insurance coverage. Health insurance coverage reduces out of pocket payment, and makes medical care more affordable for countless non-wealthy people. To address the exponential increase in prices that took place in 2007 over 2006, many Jamaicans purchased health insurance as percentage of people holding health insurance coverage stood at 21.2%, the highest in the nation's 20 year history. Concomitantly, only 2.2% of those in the poorest income categorization were holders of health insurance coverage and 10.1% of those just above the poverty line, suggesting that health care treatment would be an out-of pocket payment for those individuals. With the typologies of diseases reported by Jamaicans being hypertension; diabetes mellitus; asthma; and arthritis; health insurance coverage increases the probability of medical care utilization and non-out of pocket expenditure on medication and health care treatment. The current research revealed that health insurance coverage is positively correlated with not seeking medical care. However, the association is not a linear one and so, beyond 18% of Jamaicans holding health insurance coverage, more of them see it as switching to not seeking medical care. Embedded in this finding is the fact that buying more health insurance coverage does not indicate a willingness to seek medical care treatment as beyond a certain percentage health insurance ownership does not encourage more health care-seeking behaviour.

The WHO [1] opined that poverty is associated with increased chronic diseases and premature death, and this is cemented by this work. The findings herein revealed that poverty is positively correlated with lowered medical care seeking behaviour; and it was also found that there is a negative relationship between mortality and poverty. This denotes that more poverty does not equate to increased death; instead the converse is true. The study showed that when mortality is high, poverty is less than 18% and that when poverty increased beyond 20%, mortality begins to decline and that it reaches it least when poverty is in excess of 40%.

If poverty is not directly correlated with mortality, then is it possible that there are premature deaths of the poor?

Studies on morality have shown that there is a high correlation between patterns of death and health and/or life expectancy [27, 28], indicating that not unattended health conditions could cause death. According to Kimmel [29], 80% of deaths post 65 years is attributed to cardiovascular diseases, blindness, hearing impairment, diabetes, heart conditions, high blood pressure, arthritis, and rheumatism. While this study was on Jamaicans and not of a particular age cohort, the poor reported the greatest percentage of health conditions and within the context of their inaffordability and low response to seek medical treatment compared to the other social classes, there should be some cases of premature mortality associated with low health care-seeking behaviour.

An interesting finding of the current study was observed as an association was found between mortality and not seeking medical care and that it was a non-linear one. Hence, when not seeking medical care is less than 35%, as not seeking medical care increase to this point the association between the two phenomena was positive and after it passes this threshold, increases in not seeking medical care begins to fall to approximately 55%. Beyond 55%, the association between the two variables was a positive one. It was found that an exponential increase in mortality was found when not seeking medical care surpassed 55%, suggesting that when people avoidance of health care is less than 45%, a case of premature mortality must be occurring to cause this increase in deaths. There is a direct correlation between poverty and not seeking medical care and so is not seeking medical care and inflation, which accounts for not only increased diseases; but a case of premature mortality. It is not just of premature deaths as the findings revealed that men sought less health care than women, and this account for more mortality of this group and a part of this would be premature deaths. Statistics for Jamaica in 2005 showed that there was 117 males to every 100 females that died, and this increased from 115 males to every 100 females in 1998 (Statistical Institute of Jamaica, 2008:56). Embedded in those mortality data are the fact that marginal disparity in figures could not be justifying that the drastic mortality increase could be premature deaths for only males.

Conclusions

Not seeking medical care is influenced by inflation, poverty and unemployment. With the low probability that the impoverished is likely to be holders of health insurance coverage in Jamaica, their out of pocket payment for health care treatment will be higher and therefore the high likelihood of medical care visits will be to the detriment of their health. Not seeking medical care is not a good indicator of premature mortality; but that this percentage must be excess of 55%. While this study cannot confirm a clear rate of premature mortality, there are some indications that this occurs beyond a certain level of not seeking care for illness.

Acknowledgement

The author would like to extend sincere gratitude to Ms. Neva South-Bourne who offered invaluable assistance in editing the final draft of this manuscript.

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