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Original Research

Health, Social Inequalities and Food Expenditure: The implications of the economic and financial crises

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Key words: Health, health conditions, chronic illness, economic crisis, food expenditure, social inequality, health disparity

Abstract

Introduction**:** Economic and financial crises have resulted in changes in health indicators and health financing in many developing nations. Yet no single study has evaluated health indicators (including illness, self-rated health, health care utilization, purchased medication, typology of health conditions) and food expenditure, and disaggregated these by social hierarchies.

Objectives: This work assesses health indicators (including illness, self-rated health, health care utilization, purchased medication, typology of health conditions), food expenditure and disaggregated these by social hierarchies. This paper models self-rated health by some explanatory variables as well as annual food expenditure.

Methods: Using household survey for 2007, the present study evaluates various health indicators by income quintile; model logged annual food expenditure and good-to-very good health status. Ordinary least square and multiple logistic regressions were used to establish the models.

Findings: The main findings are 1) females continue to report lower good-to-very good health than their male counterparts; 2) rural residents experienced lower health status; 3) the economically vulnerable's health is lower; 4) quality of health of those in tertiary level education is adversely affected; 5) health status of elderly is being negatively influenced; 6) the poorest spent US $6.06 (SD = US $ 3.94) daily on food compared to US 13.87 (SD = US $8.84) for those in the wealthiest income quintile; 7) 43 out of every 100 in the poorest income quintile had chronic conditions and purchased the prescribed medications compared to 73 out of every 100 in the wealthiest income quintile; 8) the greatest prevalence of people not to visit a health care practitioner were the poorest, and this was due to inafffordability (33%).

Conclusion: The findings provide a platform for action and policy framework

INTRODUCTION

In 2007 statistics revealed that 9.9% of Jamaicans were in poverty (265, 530) which increased to 12.3% in 2008 (331,160) and again rose by 124,939 people in 2009 to 456,099 people (16.9% of estimated population 2, 698,810) [1, 2]. While poverty speaks to the social inequalities that exist among social groups within a society, it does not indicate the health outcome disparities or the food expenditure of the social groups during economic and financial crises. From a national representative stratified probability sample of 1, 338 respondents, Powell and colleagues found that in 2007, 23 out of every 50 Jamaicans indicated being worse off than their parents (15 out of every 50 said the same), and 15 out of every 25 Jamaicans mentioned that their current (at the time) situation was at most the same in the last 12 months [3]. The empirical evidence is showing that many people have to face the economic difficulty of survivability, particularly the vulnerable such as rural residents, poor, elderly, female, children and lowly educated. The rise in poverty is not the only crisis experienced by the vulnerable in 2007 as inflation exponentially increased by about 195% over 2006 [4] coupled with the consequences of the drastic rise in public debt that following the banking crisis in the mid-

1990s [5]. The International Monetary Fund (IMF) opined that despite efforts of the Jamaican government to reduce the public debt in 2004, it currently stood at 128% of GDP.

It can be deduced from the empirical economic indicators on Jamaica that in addressing the public debt, the opportunity costs are 1) increased poverty, 2) reduced social welfare, 3) increased inflation, 4) increased cost of living, and 5) reduced survivability among vulnerable [1-5]. Another fact that is influencing the existence of many Jamaicans is the global economic recession, which is accounting for declining remittances to islanders [2, 6]. Remittance is a source of income for many Jamaicans, particularly poor and elderly who rely on this avenue to pay utilities, educational expenses, buy food, medical expenditure and other payments. In 2007, the mean annual food prices increased by 109% over 2002 [2], suggesting that the poor will have it increasingly difficult in the present economic climate. In fact, the percentage change in mean annual food expenditure among Jamaicans' poorest 20% in 2007 was 130 more than that in 2002 [2]. Such a reality means that many vulnerable in the population will eat less and purchased less nutritious foods in order to eat.

The literature still has not provided evidence of wider health indicators (including illness, self-rated health, health care utilization, purchased medication, typology of health conditions) and food expenditure, and disaggregated these by social hierarchies during the economic crises.

The current study assesses health indicators (including illness, self-rated health, health care utilization, purchased medication, typology of health conditions), food expenditure and disaggregated these by social hierarchies. This paper models self-rated health by some explanatory variables as well as annual food expenditure, using a household survey of 2007. And model self-rated health by some explanatory variables as well as factors accounting for annual food expenditure. These will provide a platform for policy direction and interpretation of data in the future.

Literature review

Studies that have examined health inequalities and poverty in Latin America and the Caribbean are many [7-9]; but limited research exist using data post-2001 [9-11]. One academic researcher in 2002 opined that Jamaicans continue to experience upward movements in general prices [9]. The period used by the researcher was 1988-to-1995 [9], and general prices have continued to increase since then. Increases in world wheat and other food prices have deepen the burden on the poor; but no research has examined health indicators (such as illness, typology of health conditions, health care utilization, purchased of prescribed medications, length of illness, self-rated health status), social inequality and food expenditure using data during the crises for Jamaica. Prior to the recession in Jamaica (in 2002), Van Doorslaer and Wagstaff [10] found that the actual number of visits to health care facilities were the lowest among those in poorest income quintile, and that need-preventive visits is the greatest for this social cohort. The scholars also found that people who rated their health status as poor did not seek more curative visits than those who rated their health as good or very good [10].

Clearly there is a need for health care visits among those in the poorest income quintile as well as other social groups; but inaffordability, particularly among the vulnerable, is resulting in a switch from health seeking to food and other basic demands. The consequences of increased poverty, unemployment, reduced food quality, increased food and fuel prices, increased educational costs and increased public debt have left many people suffering from various depressive conditions. One study revealed that there is an exponential increase in percent of respondents who were generally dissatisfied with their living standard in 2008 (from 2.6% in 2000 to 5.1% in 2008) [11]. The dissatisfied in Jamaica include the vulnerable, and when the poorest's cost of medical care is more than daily food expenditure, this must adversely affect their mental health. Outside of increased psychiatric disorders, are there upward movements in other health conditions during the crisis?

Wilks and Colleagues [11] found that diabetes increased by 0.7%, hypertension by 4.3%, and pre-hypertension by 5.4% in 2008 over 2000. Neither chronic conditions nor general satisfaction with life for 2000 and 2008 were disaggregated by social groups in order to provide an understanding of social inequality and health outcome disparity in the crises. However, Wilks et al.'s research provided that 27.2% of people in the lower class had hypertension, 8.8% had diabetes and 36.8% were in the pre-hypertensive stage, which were greater than for people in social groups [11]. It can be inferred from the work that there is increased chronic illnesses, with the poor suffering more and that some people having more than one ailment.

At 6th International Diabetes and Hypertension Conference, which was held in Jamaica in March 2000, Callender opined that there was a positive association between diabetic and hypertensive patients, and that 1 in every 2 individuals with diabetes had a history of hypertension [12]. Diabetes mellitus is not the only challenge faced by patients, but McCarthy [13] argued that between 30-60% of diabetics also suffer from depression, which is a psychiatric illness. Such a situation further complicates the woes of the elderly as

they seek to balance other psychosocial conditions with the diabetes and hypertension along with the stress that is frequently associated with the illness. Morrison [14] 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.

The global economic and financial crises are having adverse effect on the health status of people, and a statement by Director General of the World Health Organization [15] outlined that the first measure is to protect the poor from the growing increases in food and fuel prices. One of the rationale for the comments by the Director-General of WHO is the detrimental consequences of the economic and financial crises on the health of the poor, elderly, disabled, women, children and those with chronic illness. With empirical evidence showing that there is association between increased illness and economic crises [16], this does not speak well for the economically marginalized in the society who oftentimes must make a choice of food and medical care during these crises. The matter becomes even more problematic when illnesses, particularly chronic conditions, increase among the poor during financial and economic crises. One of the features of economic and financial crises is its influence on reduced remittances in Jamaica [17], which retards the choices of the economically marginalized groups. Reduced health care is one such choice that is made in the interest of food, shelter and mere survivability among the aforementioned peoples, which highlights the delayed costs on health and health in the future.

The global economic crisis is undoubtedly affecting the health of peoples in the Caribbean and Indonesia as well as in Africa [18] and Latin America [19], and the consequences of the crises continue to negatively plague developing nations. Economic restructuring has resulted because of the crisis that is causing governments and peoples to find it increasingly difficult to need health demands and targets, particularly Jamaica [20]. One academic researcher believed that this is threatening health in the world [21] as government focus on the economic and financial meltdown at the expense of health, exposing the marginalized groups to more hardship and '***healthship***'. There is no denial that economic and financial crises have made more people economically vulnerable, and many people find it increasingly difficult to purchase food, health care and educational needs [22]. In response to the continued marginalization of vulnerable people during these crises, governments have implemented different social safety measures [22, 23]. Outside of the social safety measures to address the global economic crises, the crises are causing adverse influence on health outcome, education and health financing, which are well documented in nations like Jamaica [24].

Using Jamaica Survey of Living Conditions (JSLC) from 1989 – 2007, Kim and Serra-Garcia [24] noted that the influence of economic downturn on health indicators in Jamaica is mixed. The health indicators used by Kim and Serra-Garcia were 1) child diarrhoea, 2) illness and 3) BMI (body mass index). Furthermore, Kim and Serra-Garcia found that illness rate and child diarrhoea increased during economic crisis and that "Since the impact is not in one direction or of the same magnitude, policy responses to economic downturns should be carefully designed and packaged [24].

Theoretical and empirical framework

The use of econometric modeling for determining social determinants of health is well documented in the literature [25-29]. Using econometric analyses (multiple logistic regressions), Bourne and McGrowder [30] modeled social determinants of the health of rural Jamaicans. When Grossman [25] first developed this approach to health research, he wanted to assess how many factors explain health demand. The chosen theoretical and analytic framework allowed for the testing of many possible variables on a single health variable. Health literature has shown that health status can be dichotomized into two groups [30-33]. Based on the empirical findings in the literature, care should be taken as to where the moderate health status is placed, as Bourne [34] opined that moderate health status can be fitted into good-to-very good health status for males; and that it is closer to good than poor health. Thus, for this study, the dichotomization of the health status was good-to-very good and moderate-to-poor. All the selected variables to be tested in this study were based on literature on the social determinants of health [26-34]. In this model building, the variables were entered into a block, from which the significant ones emerged as the factors which accounted for good-to-very good health status. Similarly this approach was used to evaluate factors that determine annual food expenditure.

MATERIALS AND METHODS

Study design

The current study is a secondary data analysis, using a national representative household survey, Jamaica Survey of Living Conditions (JSLC) [35].The 2007 JSLC was conducted in May and August of that year. It is nationally cross-sectional survey of 6,782 Jamaicans. The JSLC was conducted by the Planning Institute of Jamaica (PIOJ) and the Statistical Institute of Jamaica (STATIN) [2].

The PIOJ and STATIN are non-profit organizations

focusing on data collection and policy assessment. The data aid in the evaluation of the government's social programmes, including census taking, among other issues. Funded by the central government, these organizations deliver evidence-based information. Since 1989, these organizations have been collecting data on Jamaicans in order to evaluate the social programmes which were instituted by the government. The data was collected by way of an administered questionnaire, and was published in a document entitled, 'Jamaica Survey of Living Conditions' (JSLC). The JSLC is a modification of the World Bank's Living Standards Measurement Study (LSMS) household survey [2].

The survey was drawn by 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 was an Enumeration District (ED), which constituted a minimum of 100 residences in rural areas and 150 in urban areas. An ED was an independent geographical unit that shared a common boundary. This means that the country was grouped into a 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 the dwellings was compiled, which in turn provided the sampling frame for the labour force [2]. The sample was weighted to reflect the population of the nation [2]. An extensive description of the sample design has been presented in other works [30-32].

Statistical analysis

Descriptive statistics were computed for demographics characteristics, health status, presence of illness, health care seeking behaviour, health insurance coverage, self-reported diagnosed health conditions, purchased medication, cost of private health care visits, length of illness, food expenditure, and utility bills and crowding. Continuous variables were presented as means and standard deviation, and those of dichotomous and non-dichotomous variables as frequencies and percents of the respective totals. Pearson's χ^2 test was used to examine associations between income quintiles and particular demographic and health characteristics (or between categorical variables). The level of significance was determined at $p < 0.05$. Shapiro-Wilks test for assessing normality of the distribution and Levene's test for assessing homogeneity of variance were employed to evaluate the assumptions of the parametric tests. The data with normal distribution were examined by way of Student t test. However, data with distribution which deviates from normal were evaluated by Kruskal-Wallis test. Using stepwise ordinary least square regression, non-significant variables were eliminated with removal of 0.05. If the influence of the variable was significant at the $p < 0.05$, the standard error was calculated, with 95% confidence intervals (CI) was computed. R squared change was computed for each significant variable ($p < 0.05$), and this was used to determine the contribution of the factors in questioned.

Logistic regression was used to assess factors that account for self-rated health status of sample. The results were presented using unstandardized B-coefficients, Odds ratio (OR) and confidence interval (95% CI). The predictive power of the model was tested using the Omnibus Test of Model to examine goodness of fit of the model. The correlation matrix was examined in order to ascertain if autocorrelation (or multicollinearity) existed between variables. A p-value of 0.05 was used to test the significance level. In multiple stepwise logistic regressions, non-significant variables were eliminated using the Wald statistic with entry and removal values of 0.05 (Tables 3-5). If the influence of a particular factor was significant by a pvalue < 5%, the odds ratio (OR) with a 95% confidence interval (CI) was calculated. The odds ratio (OR) is interpreted based on the statistical term 'odds' that is derived from 'odds ratio'. The Wald statistics were used to determine the magnitude (or contribution) of each statistically significant variable in comparison with the others. The data were analyzed on a minicomputer using the SPSS statistical package for Windows Version 16.0 (SPSS Inc; Chicago, IL, USA).

Outcome variables

The dependent variable (annual food expenditure) was log in order to be fitted in the model.

Self-rated health status was dichotomous as 1=good-to-very good health, 0=otherwise

Independent variables

Age was a continuous variable, which was the number of years for which one was alive since birth (using last birthday). Age group was a non-binary measure: ages less than 15 years); ages 15 to 30 years; ages 31 to 59 years; ages 60 to 74 years; ages 75 to 84 years and ages 85 years and older.

Elderly cohort was ages 60+ years old

For presence of illness, this was taken from the question "Are you currently ill?" The options were yes or no, and yeses were treated as the presence of illness.

Self-reported diagnosed health condition came from the question "Is this a diagnosed recurring illness?" The answering options were: Yes, Cold; Yes, Diarrhoea; Yes, Asthma; Yes, Diabetes; Yes, Hypertension; Yes, Arthritis; Yes, Other; and No. All the yeses and the various categories of self-reported conditions were

listed.

For self-reported health status, the question was asked, "How is your health in general?" And the options were very good; good; fair; poor and very poor.

The categories were

1=good-to-very good, 0 = otherwise

1=moderate, 0 = otherwise

Reference group was poor-to-very poor

Social inequality was measured using income quintiles. Quintiles 1 to 5, where 1 = poorest to 5=wealthiest.

Area of residence was taken from the geo-political zones in which the individual dwells

1=urban areas, 0 = otherwise

1=peri-urban areas, 0 = otherwise

Reference group rural areas

Non-rent payers were taken from the question 'How much do you pay monthly for rent?' This was then coded into a binary variable (1=zero dollars, 0=otherwise).

Social class: This variable was measured based on income quintile: The upper classes were those in the wealthy quintiles (quintiles 4 and 5); middle class was quintile 3 and poor those in lower quintiles (quintiles 1 and 2). For the purpose of the model,

1 = middle class, 0 = otherwise

1=upper class, 0 = otherwise

Reference group was lower class

Marital status was

1= married, 0 = otherwise

1=Divorced, 0 = otherwise

1=Separated, 0 = otherwise

1=Widowed, 0 = otherwise

Reference group is never married

Social assistance is a dichotomized variable, 1= received social assistance, 0 = no

According to Gonzalez [17], "An economic crisis can be described as a long-term economic state characterized by unemployment and low prices and decreased levels of trade and investment." For this paper, we will use Gonzalez's definition of the concept.

"A financial crisis can be defined as a major collapse of the financial system, entailing inability to provide payment services or to allocate credit to productive investment opportunities" argued Gonzalez [17]. This definition is used for the present research.

RESULTS

Table 1 shows the information on demographic characteristics of the sample. One half of respondents spent US 8.80 daily on food, and 25% used US 5.77 daily. The mean age of the sample was 29.9 years (SD = 21.8 yrs). Forty nine out of every 100 respondents dwelled in rural area, one out of 2 on average spent US $26.13 monthly on food, and 31 out of every 50 people had no formal education.

Almost 15 out of every 100 respondents indicated the presence of illness. Of those who reported having an illness, 43 out of every 100 had a chronic condition (diabetes, hypertension and arthritis), 30 out of every 100 had an acute ailment (cold, asthma and diarrhoea) and 26 out of every 100 did not specify the condition. There is a marginal greater prevalence for private health care utilization (53 out of every 100) compared to private health care utilization; and 63 out of every 100 ill respondents purchased the prescribed medication (Table 2).

Table 3 presents information on income quintile with particular demographic and health characteristics of sample. The sample revealed that poverty is 5.3 times more in rural than in urban zones, and 5.9 times more in rural compared to peri-urban areas. Eleven out of every 20 people in the poorest income quintile sought medical care; 12.3% were 60+ years old; 33 out of every 100 respondents indicated being unable to afford visitation to a health care facility; 27 out of every 50 purchased prescribed medication, and 13 out of every 50 among the poorest 20% who had chronic illness also purchased prescribed medication. Seventy-three out of every 100 people in the poorest income quintile were not receiving any social assistance (or government social benefit or welfare assistance).

More respondents with chronic conditions purchased prescribed medications compared to those who had acute conditions (cold, asthma and diarrohea). Almost 57.2% of those in the poorest income quintile who indicated a chronic condition purchased the prescribed medications compared to 72.7% of those in the wealthiest income quintile (Figure 1).

No statistical relationship existed between presence of chronic conditions and income quintile ($\chi 2 = 1.709$, $P = 0.789$): 45.6% of those in the poorest quintile indicated a chronic illness compared to 40.1% among the poor; 41.1% of the middle quintile; 44.1% among the wealthy and 45.1% of those in the wealthiest income quintile.

Table 1. Demographic statistics of sample and gender, n = 6 783

Characteristic	Sample n (%)
Age group	
< 16	2 104 (31.0)
16 - 30	1 756 (25.9)
31 - 59	2 120 (31.3)
60 - 74	520 (7.6)
74 - 84	216 (3.2)
85+	66 (1.0)
Gender	
Male	3 303 (48.7)
Female	3 479 (51.3)
Marital status	
Married	1 056 (23.3)
Single	3 136 (69.2)
Divorced	77 (1.7)
Separated	41 (0.9)
Widowed	224 (4.9)
Social assistance	
Yes	637 (9.7)
No	5 936 (90.3)
Income quintile (poorest to wealthiest)	
1	1 343 (19.8)
2	1 354 (20.0)
3	1 351 (19.9)
4	1 382 (20.4)
5	
Area of residence	
Urban	2 002 (29.5)
Peri-urban	1 458 (21.5)
Rural	3 322 (49.0)
Educational level	
No formal education	4 071 (61.8)
Primary	1 681 (25.5)
Secondary	709 (10.8)
Tertiary	131 (2.0)
Head of household	
No	4 775 (70.4)
Yes	2 007 (29.6)
Length of time living in household	
25%	12 years
50%	12 years
75%	12 years
Monthly Food Expenditure*	
25%	173.01
50%	264.13
75%	375.53
Monthly Utility Bills*	
25%	12.05
50%	31.16
75%	60.34

*Values are quoted in US $ (US $1.00 = Ja. $80.47)

Table 2. Health characteristics of sample

Characteristic	Sample n (%)
Presence of illness	
Yes	980 (14.9)
No	5 609 (85.1)
Self-reported diagnosed health conditions	
Cold	149 (16.7)
Diarrhoea	27 (3.0)
Asthma	95 (10.7)
Diabetes	123 (13.8)
Hypertension	206 (23.2)
Arthritis	56 (6.3)
Unspecified conditions	234 (26.3)
Health Care Seeking Behaviour	
Yes	658 (65.5)
No	347 (34.5)
Non-response	85.2%
Reasons why did not seek medical care	
Could not afford it	62 (18.6)
Was not ill enough	144 (43.2)
Used home remedy	56 (17.4)
Did not have the time to go	13 (3.9)
Unspecified	56 (16.8)
Purchased medication	
Yes, Prescribed	617 (63.5)
Yes, Non-prescribed	255 (26.3)
No	99 (10.2))
Self-rated health status	
Very good	2 430 (37.0)
Good	2 967 (45.2)
Fair	848 (12.9)
Poor	270 (4.1)
Very poor	50 (0.8)
Typology of health care utilization	
Private Hospitals	208 (29.4)
Public Hospitals	44 (6.2)
Public Health Care Centres	124 (17.6)
Private Health Care Centres	331 (46.8)
Cost of private health care expenditure (per visit)	
25%	0.0
50%	8.70
75%	18.63
Cost of public health care expenditure (per visit)	
25%	0.0
50%	0.0
75%	3.73
Crowding index	
25%	3
50%	4
75%	6

*Values are quoted in US $ (US $1.00 = Ja. $80.47)

Table 3. Income Quintile by particular health and demographic characteristics of sample

Characteristic	Income Quintile (1=poorest to 5=wealthiest)					χ^2, *P* value
	1	2	3	4	5	
	%	%	%	%	%	
Presence of illness	14.7	13.4	15.6	15.3	15.3	3.279; 0.512
Unspecified illness	25.8	24.1	24.9	29.6	26.9	1.680; 0.794
Health seeking behaviour	54.7	63.2	66.4	68.4	73.5	17.118; <0.0001
Purchased Prescribed Medications	53.5	62.1	65.2	64.2	71.2	13.679; <0.001
Did not seek care, could not afford it	33.0	17.7	16.4	14.3	3.8	20.671; <0.0001
Gender						4.351; 0.361
Male	50.0	47.3	47.1	49.3	49.9	
Female	50.0	52.7	52.9	50.7	50.1	
Health insurance coverage	6.8	12.0	16.7	22.6	42.1	606.490; <0.0001
Education						248.476; <0.0001
No formal	54.9	58.0	61.4	63.2	71.1	
Primary	34.1	29.5	23.8	23.9	16.4	
Secondary	10.6	11.7	13.2	11.0	7.2	
Tertiary	0.4	0.8	1.6	1.9	5.3	
Marital status						67.45; <0.0001
Married	19.8	21.2	20.5	25.8	27.7	
Single	73.0	73.5	70.0	67.7	63.5	
Divorced	0.4	0.7	2.0	1.6	3.2	
Separated	1.2	0.4	1.1	0.6	1.2	
Widowed	5.6	4.2	6.4	0.3	4.4	
Area of residence						
Urban	13.8	17.9	28.8	36.9	49.5	
Peri-Urban	12.5	20.2	23.1	26.2	25.5	
Rural	73.7	61.9	48.1	36.9	25.0	
Head of household	21.7	22.6	27.2	31.7	44.4	224.076; <0.0001
Elderly	12.3	10.5	12.7	10.9	12.7	5.935; 0.204
Social Assistance						439.64; <0.0001
Yes	22.6	13.2	7.2	4.7	0.7	
						P
Age mean (SD)	26.8 yrs (22.4)	27.7 yrs (21.6)	30.7 yrs (22.5)	30.1 yrs (21.)	33.9 yrs (20.4)	<0.0001
Cost of Health Care[1]	6.66 (9.56)	12.71 (40.18)	12.66 (29.71)	15.19 (17.98)	19.66 (26.64)	< 0.05
Length of illness mean (SD)	54 days (174)	60 days (167)	35 days (107)	56 days (169)	18 days (81)	< 0.05
Monthly Food Expenditure[1] mean (SD)	181.85 (110.21)	272.12 (122.44)	302.41 (157.50)	333.21 (172.74)	388.56 (247.40)	<0.0001
Monthly Utility Bills[1] mean (SD)	18.67 (21.67)	30.16 (24.51)	45.65 (83.55)	48.73 (42.93)	78.30 (72.46)	<0.0001
Crowding index mean (SD)	6 persons (3)	6 persons (2)	5 persons (2)	4 persons (2)	3 persons (2)	<0.0001

[1]The ***value*** is quoted in United States dollars (US $1.00 = Ja. $80.47)

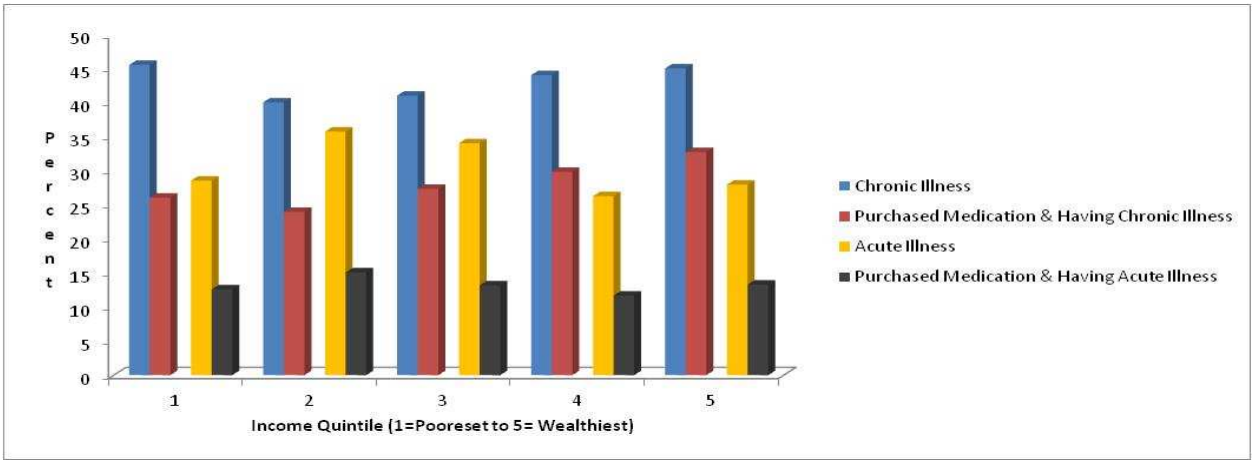

Figure 1. Income Quintile (1=poorest to 5=wealthiest) by health conditions and those with conditions who purchased medication (in %)

Table 4. Ordinary Least Square Regression: Logged Annual Food Expenditure by explanatory variables

Characteristic	Coefficient	Std. Error	CI (95%)	R^2 change
Constant	11.22	0.04	11.15 - 11.29	
Logged Income***	0.75	0.01	2.05 – 2.48	0.721
Crowding index***	0.18	0.003	0.17 - 0.19	0.035
Upper class***	0.81	0.02	0.77 - 0.85	0.015
Middle class***	0.48	0.02	0.44 - 0.52	0.003
Lower class (reference group)				
Age***	-0.003	0.00	-0.004 - -0.002	0.002
Good Health Status***	0.09	0.02	0.06 - 0.13	0.002
Poor-to-poorest health status (reference group)				
Married***	0.07	0.02	0.04 - 0.11	0.001
Never married (reference group)				
Annual Utility Bill*	$3.05^{*}\ 10^{-007}$	0.00	0.000 - 0.000	0.001
Head of Household**	-0.05	0.02	-0.08 - -0.02	0.001
Peri-urban area***	0.08	0.02	0.04 - 0.11	0.001
Urban area***	0.07	0.02	0.04 - 0.10	0.001
Rural area (reference group)				
Not paying rent**	0.05	0.02	0.02 - 0.09	0.000
Health Insurance coverage (1=yes)*	0.03	0.02	0.001 - 0.07	0.000
F statistics		1551.55; P < 0.0001		
R^2		0.784		
Adjusted R^2		0.784		
n		4 421		
*P<0.05; **P<0.01; ***P<0.0001				

a Dependent Variable: logFoodExpenditure

Table 5. Logistic regression analysis: Explanatory variables of good-to-very good health status

Characteristic	Coefficient	Std Error	Wald Lower	Odds ratio	CI (95%)
Tertiary*	-0.55	0.28	3.90	0.58	0.33 - 1.00
No formal education (reference group)				1.00	
Public health insurance coverage**	-0.45	0.14	9.96	0.64	0.48 - 0.84
Private health insurance coverage**	0.47	0.15	10.24	1.60	1.20 - 2.12
No health insurance coverage (reference group)				1.00	
Gender (1=male)***	0.36	0.09	15.85	1.44	1.20 - 1.72
Presence of illness***	-1.52	0.28	30.46	0.22	0.13 - 0.38
Social assistance (1=yes)*	-0.42	0.20	4.37	0.66	0.44 - 0.97
Elderly*	-0.40	0.17	5.64	0.67	0.48 - 0.93
Age***	-0.04	0.004	92.41	0.96	0.95 - 0.97
Annual Food Expenditure***	0.00	0.000	15.19	1.00	1.00 - 1.00
Crowding index***	-0.08	0.02	15.13	0.92	0.88 - 0.96
Peri-urban area**	0.30	0.11	6.78	1.35	1.08 - 1.68
Rural area (reference group)				1.00	
Length of illness*	0.60	0.28	4.59	1.82	1.05 - 3.15
Constant	2.85	0.34	71.55	17.27	
Omnibus χ^2 test	1342.673 ; P < 0.0001				
-2LL	3307.128				
Nagelkerke R squared	40.3%				
Hosmer and Lemeshow, χ^2	9.648; P = 0.291				
Overall percentage	84.6				
Good-to-very good health percentage	94.9				
Moderate-to-very poor health percentage	48.2				
*P<0.05; **P<0.01; ***P<0.0001 N	4,416 (65.1%)				

Dependent variable: good-to-very good health status (1=0, 0=otherwise)

Statistical difference emerged between crowding and area of residence (F = 50.026; P < 0.0001). The crowding index for urban areas was 4.3 person (SD = 2.4), with it being 4.5 person (2.3) among peri-urban zones and 5.0 person (2.6) among those in rural areas.

Disaggregating the data to reveal female, aged 15-49 years and rural residents was done for this study. Of those among the poorest quintile, 42.4% had chronic conditions.

Ten variables emerged as significant factors explaining logged annual food expenditure of sample (Table 4). The 10 factors account for 77.8% of the variance in annual food expenditure, with logged income responsible for 72.1% of the explained variability followed by crowding.

Table 5 displays the factors which account for good-to-very good health status of respondents. Ten factors (education; health insurance; gender; presence of illness; length of illness; social assistance; age; food expenditure; crowding, and area of residence) account for the variability in good-to-very good health status. The ten (10) factors explain 40.3% of the variance in dependent variable (health status) and 85% of the data were correctly classified.

Table 6 presents information on the explanatory factors of logged income. Eleven factors (food expenditure; housing expenses; social class; crowding; health insurance; area of residence; head of household; union status; health status; gender, and rental payment) accounts for 86% of the variability in the dependent variable (income). The majority of the variance in income can be explained by expenditure on food (72% of 86.6%). A positive correlation existed between food and house expenditure and logged income as well as good health status (including moderate health).

Table 6. Ordinary Least Square Regression: Logged Income by explanatory variables

Characteristic	Coefficient	Std error	CI (95%)	R^2 change
Constant	4.55	0.11	4.34 - 4.75	
Logged Food expenditure***	0.65	0.01	0.64 - 0.67	0.721
Annual Housing Expenditure ***	8.58×10^{-007}	0.00	0.000 - 0.000	0.087
Middle Class***	0.26	0.01	0.23 - 0.28	0.017
Upper class***	0.48	0.02	0.46 - 0.51	0.017
Lower class (reference group)				
Crowding index***	0.06	0.00	0.05 - 0.06	0.008
Health insurance coverage*	0.13	0.01	0.11 - 0.15	0.007
Annual Utility Bill***	1.12×10^{-006}	0.00	0.000 - 0.000	0.004
Urban area***	0.08	0.01	0.06 - 0.10	0.002
Peri-urban area***	0.04	0.01	0.02 - 0.06	0.000
Rural area (reference group)				
Head of household***	-0.06	0.01	-0.08 - -0.05	0.001
Not paying rent***	-0.06	0.01	-0.08 - -0.03	0.001
Married***	0.06	0.01	0.04 - 0.08	0.001
Good-to-very good health**	0.03	0.01	0.01 - 0.05	0.000
Moderate health*	0.05	0.02	0.01 - 0.09	0.000
Poor-to-very poor health (reference group)				
Gender (1=male)*	-0.02	0.01	-0.04 - -0.003	0.000
F statistics	1 913.0; P < 0.0001			
R^2	0.866			
Adjusted R^2	0.866			
n	4 439			
*P<0.05; **P<0.01; ***P<0.0001				

Dependent Variable: logged Income

DISCUSSION

There is enough empirical evidence to support the positive association between increased illness and economic downturn or low health and economic crises [21-24].In the same token, the consequences of economic and financial crises on vulnerable people are well documented in the literature, and responsiveness of governments in instituting various social safety nets [15-19, 21,23]. This work extends on the present literature, as well as clarifies, concurs, and provides the platform for action by policy makers. While the removal of user fees from public health care services was mandated by the Jamaican government in 2007, which by definition should have lowered the burden on the vulnerable people in the society, this was post the 2007 JSLC (May and August). Such an issue provides a particular basis upon which these findings will be examined, discussed, and interpreted.

The main findings of this study are 1) females continue to report lower good-to-very good health than their male counterparts; 2) rural residents experienced lower health status and spent less on food compared to other geo-political dwellers; 3) the economically vulnerable's health is lower; 4) quality of health of those in tertiary level education is adversely affected; 5) health status of elderly is being negatively influenced; 6) the poorest spent US $6.06 (SD = US $ 3.94) daily on food compared to US 13.87 (SD = US $8.84) for those in the wealthiest income quintile; 7) 43 out of every 100 in the poorest income quintile had chronic conditions and purchased the prescribed medications compared to 73 out of every 100 in the wealthiest income quintile; 8)

the greatest prevalence of people not to visit a health care practitioner were the poorest, and this was due to inafffordability (33%), and 9) food expenditure is positively correlated with income and income quintile.

A group of international organizations, UNDP, UNFPA, UNICEF and WFP, argued that the financial and economic crises have created more poverty, hunger, and insecurities among vulnerable groups [22]. The aforementioned institutions noted that food and fuel insecurities are resulting in increased hunter among vulnerable people, who immediately needed to be protected by governments [22]. In this research, we found that daily cost for food on average among the poorest 20% in Jamaica was US $ 6.06, which is lower than the average cost per visit to a health care facility (US $6.64). In 2007, inflation increased by 195% over 2006 which correspond to a 21% in averaged monthly daily food expenditure. With the majority of income spent on food, increases in food prices further deepen the anguish of the poor. This also translates into product switching, reduced food consumption and nutritious foods among the poorest. Such a proposition is concretized by 1) lowest health care seeking is among the poorest (55%), 2) least spent on food, 3) greatest prevalence of non-purchase of prescribed medication, 4) lowest ownership of health insurance coverage, and 5) highest prevalence of social assistance. Owing to the crises, increased food prices are explaining health care switching for food among the poorest in Jamaica. The opportunity cost of health care demand is the increased food and fuel prices that increasingly substituted among the poorest for basic necessity, food. The UNDP, UNFPA, UNICEF and WFP noted that the vulnerable in society are not only eating less, as they are eating less nutritious meals [22], which is clearly offering some future insights into the health problems of vulnerable people in Jamaica. Income which is used to purchase food and other non-food products is mostly spent on food in Jamaica, indicating that during in crisis, the poor must weigh the cost of food consumption and merely eating against education, health care visit, purchasing medication and nutritious eating. In a financial and economic crisis, therefore, health and eating well are after thought and not a necessity among the people, which strength the probability of more health conditions. Economic marginality, therefore, in periods of increased cost of food means health marginality, induced illnesses, health utilization switching for food consumption, the substitution of healthier foods for poorer food because of high costs, food matters over health care except in health emergencies and illness severity and a lowering of the quality of the human capital owing to health conditions.

With the gap between eating well and eating among the vulnerable groups in a society, increased illnesses should come as no surprise during economic and financial crises. Using empirical data for Jamaica, in 2007, self-reported illness increased by 27% over the previous year which corresponds to 195% increase in inflation (Appendix I). Outside of 2007, statistics revealed that during periods of high inflation, poverty and unemployment, self-reported illnesses are greater [Appendix I]. This study goes further than the literature showing 1) that illnesses among the poorest during an economic or financial crisis are not greater for those in the wealthiest group, 2) there is a positive association between good-to-very good health status and income, 3) a high percentage of the poor did not seek medical care because of money (lack of), and 4) 6 people were dwell in a room among the poorest. Neither was there a greater self-rated health status between the poorest and the wealthiest nor more reports of chronic health conditions. However, a positive association emerged between annual food expenditure and good-to-very good health status, suggesting that economic marginality translates into health deprivation. On disaggregating annual food expenditure, it was noted that those among the wealthiest income quintile spent on average 2.1 times more monthly on food compared to those in the poorest income quintile. Those findings highlight the economic and health plight of the poor, women and the economically marginalized in a society, which deepens with continued financial and economic crisis as they seek less health care, switch food choices, purchase less medication despite of illnesses, and lowered income broadens their inability to change with the socio-economic climate.

The paradoxical disparities in the data also emerged on examining cost per visit for health care, purchased medication, and health care utilization among the social hierarchies. The findings revealed that on average those in the poorest income quintile spent one third less than that of those in the wealthiest 20% per visit on health care services. The exponential disparity between expenditure on health care utilization was similar in purchasing prescribed medications. Fifty-seven percent of those in the poorest income quintile who had a chronic condition purchased the prescribed medication compared to 72.7% of those in the wealthiest income bracket. Another finding of this study is the direct association between annual food expenditure and good-to-very good self-rated health status; yet no significant difference was found between the poorest and the wealthiest income group as it relates to health conditions and self-reported good health status. Clearly, there are mixed signals emanating from the Jamaican data, which concurs with an earlier study conducted by Kim and Serra-Garcia [24].

There appear to be a paradox in the health outcome

data in Jamaica, and we will clarify some of these issues herein. This study showed that the self-rated health status for the poorest is the same as in other social hierarchy, yet the greater expenditure that is associated with wealthier groups is positively related to better health status. This is not a paradox as poverty is substantially rural, female, and elderly. We found that rural residents had lower self-rated good-to-very good health status as well as elderly, household with greater crowding, and females. In order to understanding why the poorest appears to have the same good-to-very good health status as the wealthy from the initial examination of the results, this is embodied in the previously mentioned findings. Almost 74 out of every 100 people in the poorest income quintile dwelled in rural areas, indicating that poverty and rural areas is synonymous. Another fact that concretized this proposition is crowding. The research showed that crowding is directly related to poverty, and that rural areas had the greatest crowding index. Hence, high crowding index is associated with poverty and rural residents, and given that crowding index is negatively related to good-to-very good self-rated health status, poverty is best measured by rural area of residence than income quintile. One more fact that concretized the area of residence phenomenon to evaluate poverty can be deduced from social assistance. The majority of people who received social assistance in Jamaica are among the poorest, and social assistance is inversely related to good-to-very good health status. Such a matter reinforces the poverty phenomenon, and supports the literature that vulnerable people have lower health status.

The direct association between education (or years of schooling) and health status is long established [25-34]. It appears that there is a contradiction as there is an inverse relationship between tertiary level education and good-to-very good health status. This may do to support Serra-Garcia's perspective that there are mixed signals in the health data [24]; but this is not the case. The present research showed that the majority of those with tertiary level education are among the wealthy social classes, and these people spent more on food than that of the poorest. Then, the question that must be answered is why there is positive association between health and food expenditure, the wealthy spent more than the other classes, the wealthy classes had most of the tertiary graduands, and still there is an inversely relationship between highest level of schooling and good-to-very good health status. The answer is embodied in money and limits. It can be extrapolated from the findings that the wealthiest having more money to spend on quality health care services, food, and other goods are spending themselves to bad health.

It is a misnomer to believe that money can buy health, even though this has been said by academic researchers like Smith and Kington [26]. Marmot warned against this perspective, using data from many countries including the United States [36]. The results are in that wealthy is an economic good and a health bad during crises. There is another side to this discourse as too little money is an economic and a health bad. The present researcher found that those in the poorest income quintile in Jamaica on average US $2.74 less than the daily mean food expenditure. Eating food is not the issue; it is the quality of food consumed by those in the poorest and wealthiest income quintile that influences their health outcome for the worse. In response to poor lifestyle practices, the wealthy seek health care to repair their actions, which is health irreversible. The poor, on the other hand, are unable to attend health care facility as they would like because of financial constraint, which is adversely influencing their health.

Poverty which is higher among rural residents, females and elderly are having the same effect on health status as little money or too much money in a crisis. While the vulnerable people are having to substitute quality food (nutritious intake) for eating and eating less [22], the health cost of the crises are undetermined as a cumulative effect of poor health choices and practices, which will add up in the future and not now. As when a female in the reproductive ages (15-49 years) substitute quality foods for poor food and eat less, if she is pregnant the health care cost extends to the child and this must be multiplied by the number of such women in the nation. Unlike female, when elderly people reduce their food intake and quality foods, this increases the likeliness of mortality, and other health conditions. The global economic and financial crises are not only increasing food and fuel prices making it difficult for the poor to need the cost of new prices, they are also eroding the future human capital in nations. UNDP and other agencies summarized the delayed effect of the food crisis aptly by saying that "Domestic food prices may eventually return to previous levels. But the impacts on poor households of the prolonged period of high prices will linger. The impacts of school drop-outs, delays in health care, increased violence, especially against girls and women, sexual trafficking, and other negative outcomes could be significant" [22].

One of the intricacies that are omitted from the UNDP and other agencies' postulation is the interrelationship between health status of women, their children and how this is complicated with poverty. However, using a sample of 3, 450 rural women aged 15-49 year, Bourne and Rhule [31] established that none of them had chronic conditions. The prevalence of chronic ailments among the same cohort in 2007 increased to 42.4%

depicts the relationship between poverty and illness, and the cost to children is still undetermined and must be factored into the costs of crises on health. The lowered health care utilization and purchases of prescribed medication among the poorest Jamaicans, particularly those with chronic conditions, will be a latent burden on the health care facility. Another probable outcome of the inactions of poor to health care utilization is mortality. Reported mortality for 2000-to-2008 was the greatest for 2007 [1]. While we cannot solely subscribe the prevalence of mortality in 2007 to the economic and financial crises, there are enough indicators pointing towards this likely increase in mortality. How much of the increase in mortality is due to premature mortality? Is morality precipitated by psychiatric disorders such as bipolar, depression, schizophrenia and a feeling of sadness?

The costs of the economic and financial crises on psychiatric disorders are not accounted for in the cost of crises. A study conducted by Wilks and colleagues during 2007/08 of some 2,848 Jamaicans aged 15-74 years found greatest percentage of people who felt down was among the lower class (41%) compared to the other social classes (35% middle and 23% upper) [11]. In relating to 'feeling sad', 39% of those in the lower class stated that this was their experience as against 29% in the middle and 26% of those in the upper class. Like the other depressive symptoms, depression was the highest among the lower class (23%) [11]. The consequences of the economic and financial crises are detrimentally influencing the mental health status of the poor as they seek to survive in the economic downturn. While psychiatric disorder cannot be confirmed or denied by this study, there was an ailment labeled 'unspecified health condition' which could include depression. Despite not having data on depressive symptoms, we can infer from illness and health conditions that these ailments are present and increased cost of living, reduced remittances, high unemployment, and low education that the expenses of the poorest would be greater as the rest of the society. By not having the financial resources to cushion the effects of inflation, and reduce remittances, the consequences of economic and financial crises would have accounted for the greater prevalence of depressive symptoms among the poorest as they are unable to cope with the economic climate.

Reduced remittances, increased unemployed and increased prices are parcel of the decline in disposable income which has resulted from the economic and financial crises in the world, and the same experience is felt by in Ireland like Jamaica [2-5, 37]. How to address the consequences of economic downturn is different in each nation? Some of the approaches taken by governments in such crises are social programmes, controls, regulations [17, 22, 23, 38, 39], investing in health [40] and financial restructuring [41]. But those do not ease the mental anguish of a job lost, foreclosure, lost income, reduced health, and lost human dignity. The study in Jamaica which found that depressive symptoms were the greatest among the poor [11] should not be startling as poverty in the face of crises is depleting mental health. Therefore, Stuckler and colleagues' work [37] which found that "Unemployment is often associated with increases in daytime drinking, with obvious long-term consequences for health." These are examples of the consequences of crisis and its effect on health of the individual, which could extend to violence, crime and murder. There is need for economic growth that will benefit the poor as well [38] as there are enough indicators which revealed that poverty coupled with the financial and economic crisis are eroding the quality of the human capital moreso of the poor, who are mostly rural residents.

CONCLUSION

Developing nations like Jamaica that have opened economies, which can be influenced by exogenous variables, cannot wait for the end of economic and financial crises before social safety programmes are launched to protect the vulnerable, particularly the poor, elderly, women, rural residents and children. Hence, during economic and financial crises intervention programmes are needed that focus on health outcome disparities, health, and health care utilization in order to protect present and future health of the population. The findings provide a platform for action and policy framework.

In summary, the present work is not typical to Jamaica as many nations in Latin America and Caribbean share similar socioeconomic characteristics like Jamaica. This work, therefore, offers insights into phenomena that have wider implications. Policy makers, now, have empirical evidences that can be used to forge new frontiers and can effectively plan for health in periods of economic and financial crises. As merely having zero user fees on public health care facilities' services do not reduce the health burden on the economically vulnerable as having the financial resources to visit the health institutions the people will still be unable to attend to their health demands and needs. The fact that in economic crisis, food prices increase, the economically vulnerable will substitute quality and nutritious foods for cheaper less nutritious items because of inability to afford the products.

CONFLICT OF INTEREST

The author has no conflict of interest to report.

APPENDIX I

Table 1. Selected Macroeconomic and health variables, 1989-2009

Year	Unemployment (in %)	Illness (in %)	Seeking Medical Care (in %)	Prevalence of Poverty (in %)	Health insurance (in %)	Inflation (in %)	Average annual exchange rate Ja $ per US $	GDP Growth (in %)
1989	18.00	16.80	54.60	30.5	8.2	17.2	5.77	4.6
1990	15.30	18.30	38.60	28.4	9	29.8	7.18	5.5
1991	15.30	13.70	47.70	44.6	8.6	80.2	12.85	0.5
1992	9.40	10.60	50.90	33.9	9	40.2	23.01	1.9
1993	9.50	12.00	51.80	24.4	10.1	30.1	25.68	1.3
1994	10.90	12.90	51.40	22.8	8.8	26.8	33.35	1.1
1995	9.60	9.80	58.90	27.5	9.7	25.6	35.54	0.5
1996	10.80	10.70	54.90	26.1	9.8	15.8	37.02	-1.8
1997	10.60	9.70	59.60	19.9	12.6	9.2	35.58	-2.4
1998	10.00	8.80	60.80	15.9	12.1	7.9	36.68	-0.7
1999	10.00	10.10	68.40	16.9	12.1	6.8	39.33	-0.5
2000	10.20	14.20	60.70	18.9	14	6.1	43.32	0.2
2001	10.30	13.40	63.50	16.9	13.9	8.8	46.09	1.1
2002	10.60	12.60	64.10	19.7	13.5	7.2	48.54	0.4
2003	9.70	12.51	58.06	19.1	NI	13.8	57.93	1.9
2004	11.7	11.40	65.10	16.9	19.2	13.7	61.34	1.9
2005	11.2	12.51	58.06	14.8	NI	12.6	62.50	1.8
2006	10.3	12.20	70.00	14.3	18.4	5.7	65.88	2.3
2007	9.8	15.50	66.00	9.9	21.2	16.8	69.06	1.2
2008	10.6	8.70	72.90	12.3	21.1	16.8	72.92	-0.6
2009	11.4	10.60	77.10	16.5	19.8	10.2	88.49	-2.8

Source: Planning Institute of Jamaica and Statistical Institute of Jamaica, *Jamaica Survey of Living Conditions*, various issues; Planning Institute of Jamaica, *Economic and Social Survey of Jamaica*, various years. Bank of Jamaica, *Statistical Digest*, various years. Bank of Jamaica. Average annual exchange rate. World Bank (2006): http://www.pioj.gov.jm/statistics.

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