

Difference in social determinants of health between men in the poor and the wealthy social strata in a Caribbean nation

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Abstract

Background: Studies that have examined social determinants of health have made their investigations on the population, but none have reviewed them from the perspective of particular social hierarchies. **Aim:** The study examined the factors determining the self-reported health of men of different socioeconomic status, by using models derived through econometric analyses. **Materials & Methods:** The study used a sample of 6,474 respondents: 2,704 from the two poor quintiles and 3,770 from the two wealthy quintiles. The survey used a random stratified probability sampling technique and involved the use of self-administered questionnaires. Multiple logistic regression technique was used to identify variables which are associated with health conditions of men in the two social hierarchies. **Results:** The findings revealed that the self-reported health of men in the two wealthiest quintiles were substantially influenced by private health insurance coverage (Odds Ratio (OR) = 32.9, 95%CI: 20.64, 52.45) and age of respondents (OR = 1.03, 95%CI: 1.02, 1.04) This was similar for men in the two poorest income quintiles; private health insurance coverage (OR = 16.97, 95%CI: 10.18, 28.27) and age (OR=1.05, 95%CI: 1.03, 1.06). Negative affective psychological conditions, consumption and medical expenditure affected the self-reported health of those in the two wealthiest quintiles, while positive affective, secondary levels of education and living alone influenced those in the two poorest quintiles. **Conclusion:** This research serves as a foundation for further work relating to the determinants of self-reported health conditions, inequity across socio-economic strata for men, and how patient care should be addressed.

Keywords: Self reported health, men's health, social hierarchy, social determinants.

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Introduction

In recent years the World Health Organization (WHO) has increasingly drawn attention to the importance of the relationship between health and social conditions in determining the health of individuals and populations [1]. Social determinants (conditions in which people are born, live, grow, work and age as well as the health system available to them) produce inequalities in health, and need to be considered in health development. Addressing social determinants and health policy now forms the basis for

political action both nationally and internationally [2].

Human poverty is defined as more than income poverty; it is the denial of choices and opportunities for living a tolerable life [3]. Poverty as described above in the Caribbean has been predominantly a rural phenomenon; however, rising levels of urban poverty have also been seen. In 1996 the World Bank estimated 38% of the total population (or 25% including Haiti) in the Caribbean, or more than seven million people, to be poor [4]. One study

found that rural poverty in Argentina, Barbados, Bolivia, Brazil, Colombia, Jamaica, Suriname, Trinidad and Tobago, and Uruguay was at least twice more than urban poverty [5]. According to the Jamaica Survey of Living Conditions (JSLC), in 2003, the poverty rate stood at 19.1%, and in 2007 it fell to 9.9% [6]. The JSLC for 2001 [6] indicates that the wealthiest 20% of the population accounted for 45.9% of national consumption, while the poorest 20% accounted for only 6.1% of national consumption.

On average, the wealthiest 10% of the population consumed approximately 12.5 times more than the poorest 10% [6]. This is a mean per capita annual consumption expenditure of US\$ 3,963.53 compared to US\$ 314.48. Gafar found that in some Latin American and Caribbean countries, between 2 to 8 percentage of income is estimated to be received by those in the poorest 20% compared to between 42 and 58% that is received by those in the wealthiest 20% [5] which indicates that income inequalities are vast between the poor and the wealthy within those societies, and does account for some of the health disparities between the social hierarchies.

According to the WHO's definition, health is not merely the absence of disease but the highest possible state of physical, social and mental wellbeing. At both a societal and individual level, the aim is to extend healthy life expectancy, as well as productivity and quality of life at older ages for as long as possible [7]. Understanding how the social determinants influence health and social wellbeing is an area of considerable research interest. That the unequal distribution of variables such as income, unemployment and education produce health inequalities, has been documented [8-10]. Studies have established a statistical relationship between health status and poverty [11-13], between standard of living and health conditions, health status owing to a particular natural disaster [14,15], and income and health [16]. It is recognized that more information is needed at the social level, and that knowledge needs to be translated into action [17].

People with lower socioeconomic status have worse health in all adult age groups, including older ages [18]. Age has been identified as an important social determinant of health. Among adults, reduced capacity to generate income, and the growing risk of illness increase the vulnerability of the elderly to poverty; regardless of their original economic status in developing and industrialized countries [19].

Gender is equally as important a social determinant of health. Men are experiencing poverty. It is important to understand the factors influencing self-reported health. Many studies that have examined those in the poor and wealthy income groups have used a piecemeal approach, and in the Caribbean this is also the case. Studies that have examined social determinants of health [1, 2, 8-17] have made their investigations in the population, but have not reviewed them from the perspective of particular social

hierarchies within a nation, in order to establish if the factors are the same, and if not, what the disparities are. It is within this framework that the present study examined factors determining self-reported health among men in the two poorest and the two richest quintiles in Jamaica, in order to provide public health specialists and policy makers with research findings on these cohorts.

Materials and Methods

The current study extracted a sample of 6,474 men; (2,704 from the two poorest quintiles and 3,770 from the two wealthiest quintiles) from the dataset of the Jamaica Survey of Living Conditions (JSLC). The inclusion/exclusion criteria were (1) being males, and (2) being classified in the poor or wealthy social strata. The survey (JSLC) was a nationally representative probability sample in which self-administered questionnaires were used to collect data from the populace [20]. The information is from the civilian and non-institutionalized population of Jamaica. It is a modification of the World Bank's Living Standards Measurement Study (LSMS) household survey.

The survey was drawn using stratified random sampling. The 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 a minimum of 100 residences in rural areas and 150 in urban areas. The sample was weighted to reflect the population of the nation. The non-response rate for the survey was 27.7%.

Measurements

Self-reported health conditions: This is a dummy variable, where 1 = self-reported ailment, injury or illness in the last four weeks, which was the survey period, 0 = otherwise. Thus, self-reported health is a binary variable, where 1 = not reporting an illness, and 0 = reporting an ailment.

Living arrangement:

Crowding = $\sum_{i=1}^n \frac{h_i}{r}$, where h_i represents each person in the household, and r is the number of rooms excluding kitchen, bathroom and verandah.

Age: This is a continuous variable, ranging from 15 to 99 years.

Psychological conditions are the psychological state of an individual, and this is subdivided into positive and negative affective psychological conditions. Positive affective psychological condition is the number of responses with regard to being hopeful and optimistic about the future and life generally. Negative affective psychological condition is the number of responses from a person on having lost a breadwinner and/or family member, having lost property, having been made redundant, or failing to meet household and other obligations.

Table 1 Demographic characteristics of sample

	<i>Two Poorest Quintiles</i>		<i>Two Wealthiest Quintile</i>	
	N=2,704	%	N=3,770	%
Educational attainment				
Primary and below	551	23.4	603	18.2
Secondary & post-sec	1787	75.8	2,414	73.0
Tertiary	18	0.1	291	8.8
Marital Status				
Married	593	22.8	1,058	29.0
Never married	1902	73.1	2,370	65.0
Divorced	7	0.3	49	1.3
Separated	17	0.7	51	1.4
Widowed	83	3.2	116	3.2
Household Head				
No	94	3.5	1,505	40.0
Yes	2610	96.5	2,261	60.0
Age Group				
Youth (15 – 25yrs)	973	36.0	1015	26.9
Older adults (26 -59 yrs)	1214	44.9	2135	56.6
Elderly (60+ yrs)	517	19.1	620	16.4
Self-reported Health Conditions				
None	2229	84.2	3,038	82.7
At least one	418	15.8	637	17.3
Receiving Retirement Income				
No	2625	97.7	3,426	91.0
Yes	63	2.3	339	9.0
Living Arrangement				
With family	2532	93.6	2,673	70.9
Alone	172	6.4	1,095	29.1
Ownership of Private Health Insurance				
No	2508	95.2	3,462	96.6
Yes	127	4.8	118	3.3
†Average annual Consumption US \$301.79 (SD=US \$96.16)			US\$1,326.50(SD=US \$1,054.97)	
Crowding mean (SD)	2.3 persons (1.4 persons)		1 person (0.798 person)	
Crime Index mean(SD)	1.7(7.3); Range=88, 0		2.5(8.5); Range=88,0	

†1US\$ = Ja. \$50.97 (in 2002)

Natural disaster: This is the number of responses from people who indicated suffering landslides; property damage due to rains, flooding and soil erosion.

$$\text{Crime Index } i = \sum_{j=1}^n (k_i, T_j)$$

where k_i represents the frequency with which an individual witnessed or experienced a crime, where i denote 0, 1 and 2, in which 0 indicates not witnessing or experiencing a crime, 1 means witnessing 1 to 2, and 2 symbolizes seeing 3 or more crimes. T_j denotes the degree of the different typologies of crime witnessed or experienced by an individual (where $j = 1 \dots 4$, which 1 = valuables stolen, 2 = attacked with or without a weapon, 3 = threatened with a gun, and 4 = sexually assaulted or raped. The summation of the frequency of crime by the degree of the incident ranges from 0 to a maximum of 51.

Consumption: The total sum which is spent by an individual on durable and non-durable good during a 12-month period.

Statistical analysis

Statistical analyses were performed using Statistical Packages for the Social Sciences (SPSS) 16.0 software for Windows (SPSS Inc, Chicago IL). Descriptive statistics

were used to provide basic information on the sampled population. Logistic regression analyses were used to establish the model to ascertain parameters, and determine the strength of each statistically significant variable ($P < 0.05$). The predictive power of the model was tested using the Omnibus Test of Model and Hosmer and Lemeshow [23] was used to examine goodness of fit of the model. The correlation matrix was examined in order to ascertain whether autocorrelation (or multi-collinearity) existed between variables. Cohen and Holliday [24] stated that correlation can be low/weak (0 to 0.39); moderate (0.4-0.69), or strong (0.7-1.0). This was used to assist in the exclusion (or retention) of a variable in the model. In support of this, where collinearity existed ($r > 0.7$), variables were entered independently into the model to assist in determining which one should be retained during the final model construction. The decision to retain (or exclude) was based on the variables' contribution to the predictive power of the model and its goodness of fit. To derive accurate tests of statistical significance, we used SUDDAN statistical software (Research Triangle Institute, Research Triangle Park, NC), and this adjusted for the survey's complex sampling design.

Table 2 Logistic regression: Health conditions of men in the two poorest quintiles by some explanatory variables.

Explanatory Variables	β Coefficient	Odds Ratio	CI (95%)
Retirement income	0.166	1.18	0.52 - 2.68
Age	0.044	1.05	1.03 - 1.06***
Household head	-0.746	0.47	0.15 - 1.50
Log averaged consumption	-0.033	0.97	0.54 - 1.73
Separated/Div/Widowed	-0.123	0.88	0.48 - 1.64
Married	-0.179	0.84	0.56 - 1.25
†Single		1.00	
Other Towns	-0.237	0.79	0.50 - 1.26
Urban areas	-0.359	0.70	0.38 - 1.30
†Rural area		1.00	10.18 - 28.27***
Health Insurance	2.831	17.0	
Natural disaster	0.032	1.03	0.75 - 1.41
Secondary & post secondary	0.599	1.82	1.24 - 2.68**
Tertiary	-0.931	0.39	0.04 - 4.23
†Primary & below		1.00	
Living arrangement	0.328	1.39	1.02 - 1.88*
Crowding	-0.072	0.93	0.80 - 1.08
Negative affective	0.007	1.01	0.96 - 1.06
Positive affective	-0.087	0.92	0.86 - 0.98**
Logged medical expenditure	0.038	1.04	0.93 - 1.16
Crime index	0.014	1.01	1.00 - 1.03
Males No./household	0.009	1.01	0.84 - 1.21
Female No./household	0.043	1.04	0.87 - 1.26

-2 Log likelihood =1195.541; Nagelkerke R Square = 0.306; Model χ^2 (21) = 360.02, $P < 0.001$; Overall correct classification = 89.1% ; Correct classification of cases of no health conditions = 98.5%; Correct classification of cases with at least one dysfunction =28.7%; †Reference group; * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Analytic model

The multivariate model used in this study to examine the sub-sample is a modification of that of Grossman [21] and Smith & Kington [22] which captures the multi-dimensional concept of health status and conditions. The present study further refined the two aforementioned works and in the process added some new factors, such as psychological conditions, crowding, house tenure, and the number of people in the household. Using econometric analysis the study sought to model the self-reported health of men in the two wealthiest and poorest quintiles from a general set of social determinants identified in the literature, as seen in the equation below (Equation [1]).

$$H_i = f(L_i, R_i, \ln C, E_n, AR_i, SS_i, CR_i, (\sum_{i=1}^n NP_i, PP_i), \ln E_i, HH_i, A_i, HI_i, M_i, F_i, MR_i, ED_i, \ln ME_i) \dots [1]$$

H_i is a function of the 17 variables. L_i is living alone of person i , 1 if living alone, 0 if not living alone; R_i is retirement income of person i , 1 if receiving private and/or government pension, 0 if otherwise; $\ln C$ is the average consumption expenditure of person i , in dollars; E_n is the

natural disaster, 1 if in the lived milieu there has been flooding, soil erosion, landslide, 0 if not; AR_i is the area of residence, other towns, KMA with the reference group being rural areas; SS_i is social support, 1 if yes, 0 if no; CR is crowding in the household of person i ; $\ln E_i$ is the average total expenditure of the person i in dollars, which is the proxy for income; HH_i is household head of person, 1 if yes, 0 if no; A_i is age of person i , in years; HI_i is health insurance coverage, 1 if person has a health insurance policy, 0 if otherwise; M is number of males in household of person i ; F is number of females in household of person i ; MR_i is marital status of person i ; ED_i is educational level of person i ; $\ln ME_i$ is medical expenditure of person i ; $(\sum_{i=1}^n NP_i, PP_i)$ NP_i is the summation of all negative affective psychological conditions and PP is the summation of all positive affective psychological conditions.

The final model consisted of only those variables which are statistically significant ($P < 0.05$). Equation [2] represents those factors that explain the health conditions of those in the poorest 20% and equation [3] denotes variables which are correlated with the health conditions of those in the wealthiest 20%:

$$H_i = f(L_i, PP_i, A_i, HI_i, ED_i) \dots [2]$$

$$H_i = f(\ln C_i, NP_i, A_i, HI_i, \ln ME_i) \dots [3]$$

Results

Characteristics of sample

There are diverse dissimilarities between the demographic characteristics of men in the two poorest quintiles and those in the two wealthiest quintiles. The average consumption per head for the poor was US\$301.79 (SD = US\$96.16), which represented 22.1% of the average consumption expenditure per head of those in the two wealthiest quintiles. Similarly, the crowding for men in the two wealthiest quintiles was 1 person (SD = 0.798 person) compared to 2.3 persons (SD = 1.4 persons) for those in the two poorest quintiles. Furthermore, 4.6 times more men in the two wealthiest quintiles resided alone, compared to those in the poorest quintiles. There was a remarkable difference in the level of tertiary education of the two sampled groups, as for every 1 man in the two poorest quintiles with tertiary level education there were 88 men in the two wealthiest quintiles. In addition to the aforementioned differences, there are 4 times more men in the two wealthiest quintiles who are receiving retirement income compared to those men in the two poorest quintiles (Table 1). Moreover, those in the two wealthiest quintiles are more vulnerable to crime (2.5 ± 8.5 ; Range = 88, 0) compared to those in the poorest quintiles (1.7 ± 7.3 ; Range = 88, 0).

The disparity was narrower for self-reported health conditions, as for every 100 men in the two poorest quintiles who indicated a health condition there were 109 men in the two wealthiest quintiles.

Table 3 Logistic regression: Health conditions of men in the two wealthiest quintiles by some explanatory variables.

Explanatory Variables	β Coefficient	Odds Ratio	CI (95%)
Retirement income	0.375	1.46	0.73 - 2.91
Age	0.032	1.03	1.02 - 1.04***
Household head	0.396	1.49	0.46 - 4.85
Log average annual consumption	0.632	1.88	1.27 - 2.80**
Separated/Divorced/Widowed	-0.227	0.80	0.49 - 1.29
Married	-0.178	0.84	0.62 - 1.13
†Single		1.00	
Other towns	-0.124	0.88	0.68 - 1.15
Urban	-0.188	0.83	0.59 - 1.16
†Rural area		1.00	20.64 -
Health insurance	3.494	32.90	52.45***
Natural disaster	-0.142	0.87	0.67 - 1.13
Secondary & post-secondary	0.081	1.08	0.79 - 1.49
Tertiary	-0.243	0.78	0.46 - 1.32
†Primary & below		1.00	
Living arrangement	-0.139	0.87	0.69 - 1.10
Crowding	-0.030	0.97	0.81 - 1.17
Negative affective	0.071	1.07	1.04 - 1.11***
Positive affective	-0.019	0.98	0.93 - 1.04
Logged medical expenditure	0.086	1.09	1.00 - 1.19*
Crime index	0.007	1.01	1.00 - 1.02
Male number /household	0.157	1.17	0.98 - 1.40
Female number /household	0.185	1.20	0.99 - 1.47

-2 Log likelihood = 2054.45; Nagelkerke R Square = 0.280; Model $\chi^2(21) = 522.79$, $P < 0.001$; Overall correct classification = 87.6%, Correct classification of cases of no health conditions = 99.0%; Correct classification of cases with at least one dysfunction = 29.0%; †Reference group * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Multivariate Analysis

Predicting the health conditions of men in the two poorest quintiles: In the investigation of the factors which predict the health conditions of men in the two poorest quintiles, it was found that the data was a good fit for the model as 89.1% (n = 1,755) of the data were correctly classified; 98.5% of those who indicated no health condition were correctly classified, with 28.7% reporting that they had at least one dysfunction (Table 2). Moreover, the 5 factors accounted for 30.6% of the variability in health conditions of this group: -2 log likelihood = 1195.541; Nagelkerke $R^2 = 0.306$; $\chi^2(21) = 360.02$, $p < 0.001$.

Predicting health conditions of men in the two wealthiest quintiles: In investigating the self-reported health of men in the two wealthiest quintiles, it was found that the data was a good fit for the model, as 87.6% (n = 2,533) were correctly classified; 99.0% (n = 2,396) of those who indicated no health condition were correctly classified, with 29.0% (n = 76) of those mentioning that they had at

least one dysfunction (Table 3). Of the 17 variables that the researchers tested, only 5 were statistically significant.

Discussion

This study makes an important contribution to understanding self-reported health in Jamaican men in two ways. It provides both an econometric model which can be used on sub-samples of data sets for routine data collection, and it identifies the variables involved in determining the self-reported health of the poorest and wealthiest Jamaican groups. The study is timely, given the increasing recognition of the contribution of social determinants to health [1]. The findings of this study suggest that age, average consumption, private health insurance coverage, level of education, whether or not the person lived alone, medical expenditure and positive or negative affective psychological conditions were determinants of the self-reported health of the wealthiest and poorest men in Jamaica. Age, health insurance and psychological conditions are common to both groups, while consumption and medical expenditure are significant for the wealthiest, and education and living arrangements for the poorest quintiles. These findings are contrary to those of other studies [21, 22], and therefore contribute to the local understanding of the relationship between self-rated health status and the socio-economic status of men in Jamaica.

Age was the second most significant predictor of self-reported health for both groups. The Jamaican Healthy Lifestyle Survey Report 2000 [25] noted a prevalence of hypertension of 19.9% among males, which increased with age in both rural and urban populations and in both sexes. The most common chronic diseases identified among elderly males and females were hypertension, arthritis, diabetes, cardiovascular arrest, stroke and cancer. Patients in the 60-and-over age groups accounted for 37.2% and 41.1% respectively, of new hypertensive and diabetic cases [26]. Diabetes is one of the leading causes of morbidity and mortality among persons aged 65 and older [27].

Having health insurance was a predictor for both groups of quintiles. Access to services also depends on the capacity to pay, which can exclude men in the poorest quintile and who might have lived all their lives in poverty [28]. The health problems of older men often necessitate prolonged medication and treatment. The high cost of consultations, diagnostic services and particularly medicines are among the most formidable barriers to appropriate and timely care. Deprivation earlier in the life cycle, in terms of education and paid employment, means that older men in the two poorest quintiles are less likely than their counterparts in the two wealthiest quintiles to be literate, to have participated in the formal labour force, or to receive retirement pensions or benefits, such as health insurance coverage. Even when they do receive a retirement pension, this is likely to be lower than that of their wealthier counterparts because of the lower average wages that they earned when employed. Thus, many lack the means to

meet their needs [28].

In this study 4.8% of men in the two poorest quintiles possessed medical insurance, compared with 3.3% of men in the two wealthiest quintiles, and this was lower than the 7.6% reported in a previous study [29]. This finding suggests that the cost of health care is the individual's responsibility and for the poorer quintiles emphasizes the reliance on public services.

Being in fair or poor health, or having a chronic health condition, is strongly associated with being underinsured. Compared to those in better health, individuals who rate their health as fair or poor are almost three times as likely to be underinsured (19% versus 7%). While this is true regardless of residence, rural non-adjacent residents in poorer health have the highest underinsured rate [30]. Studies have also shown that the lack of health insurance coverage is a significant barrier to treatment, and rural areas have disproportionate populations of uninsured and underinsured [31, 32]. As a result of a large percentage of rural men being employed in small businesses or being self-employed, they are more likely to be uninsured. Bennett and colleagues [33] postulated that rural residents were more likely to be uninsured than urban residents (17.8% versus 15.3%), and that rural respondents were more likely than urban counterparts to report having deferred health care because of cost (15.1% versus 13.1%). This study supports the findings of other studies.

The current study found that a positive affective psychological condition was a predictor of self-reported health for those in the two poorest quintiles, while a negative affective condition was a predictive factor for those in the two wealthiest quintiles. This means that the more a wealthy individual experiences negative affective conditions, he/she is 1.074 times (or 7.4%) more likely to report health conditions, suggesting that increased negative conditions result in more hypertension, diabetes mellitus and other types of illnesses. Positive affective psychological conditions, on the other hand, were inversely correlated with health conditions for those in the two poorest quintiles. There, those in the two poorest quintiles who experienced more positive conditions were 8.3% less likely to report health conditions. Embedded in this finding is the role negative and positive affective conditions play in determining the health conditions of different sub-groups in the Jamaican population.

Psychological wellbeing is dependent on a host of factors, including genetic traits, social support systems, personality types, and the presence of positive and negative psychological constructs such as happiness, optimism, morale, depression, anxiety, self-esteem, self-efficacy, and vigour. Psychological wellbeing is particularly important for the prevention or management of cardiovascular disease, but it also has important implications for the prevention and management of other chronic diseases such as diabetes, osteoporosis, hypertension, obesity, cancer and depression [34], which have been identified as significant

in the Jamaican population.

People's cognitive responses to ordinary and extraordinary situational events in life are associated with a different typology of wellbeing [35]. It is found that happier people are more optimistic, and as such they conceptualize life's experiences in a positive manner. A study by Diener and colleagues [36] found that self-reported wellbeing (personal happiness) of the wealthy-affluent (those earning in excess of US 10 million annually) was marginally more than that of the lower wealthy, suggesting that high incomes do not increase happiness by the same proportion. The distinction between the importance of the positive and negative affective conditions of the poor and rich respectively, underlines the importance of the state of mind in perceived health. According to Harris and colleagues [37] and Kashdan [25], negative psychological conditions affect subjective wellbeing in a negative manner (i.e. guilt, fear, anger, disgust), and positive factors influence self-reported wellbeing in a direct way. This concurs with findings in studies conducted by Fromson [38] as well as by other scholars [39, 40]. Furthermore, the poor may become more optimistic, even with a decline in their health status. Thus the poor remain hopeful irrespective of their health conditions. The rich, on the other hand, report that a negative affective psychological condition, such as the loss of a family member, is associated with their decline in health.

Education was another of the five predictors of self-reported health for those in poor quintiles. For every eighty-eight men in the two wealthiest quintiles attaining a tertiary level of education, there was only one man in the two poorest quintiles. Education is closely associated with an individual's health status, and high average educational levels are closely associated with higher average life expectancy [41]. Furthermore, educational attainment is linked to many aspects of a person's wellbeing. Research has shown that higher levels of education usually translate into better health status, higher incomes, and consequently higher standards of living [42] and better cognitive functioning in older age [43]. Men with less education and who are poorer are more likely to experience earlier onset of disease, loss of functioning, and physical impairment [44]. Hayward and colleagues [45] reported onset of diseases and death 5–10 years earlier for persons with lower socioeconomic status. The average number of biological risk factors indicating physiological dysregulation is also higher for poorer people and people with less education [46]. In addition, education significantly affects how effectively people utilize health care. Education further affects health because well-educated people may be more aware of the benefits and disadvantages of certain types of behaviours associated with personal health [47].

Importantly, marital status did not appear to be a proxy for who a person lives with, as it was not a significant determinant of self-reported health conditions. Smith and Waitzman's work [48] noted that men's gains from

marriage were greater than those of women [49]. Smith and Waitzman [48] offered the explanation that wives dissuaded their husbands from particular risky behaviours, such as the use of alcohol and drugs, and would ensure that they maintain a strict medical regimen coupled with proper eating habits [50,51] which accounts for them having greater wellbeing than their non-married counterparts. Surprisingly, more men in the two wealthiest quintiles lived alone. Older men are likely to live alone and be unconnected to any family unit because of irresponsible patterns of sexual behaviour and parenting or unstable relations during their younger years [52].

The wealthiest in the society experience better health, due to their knowledge of health risks and their access to the resources necessary to avoid such risks, and to treat health conditions [53, 54]. But with increasing wealth and development there has been an increase in chronic diseases, as lifestyle changes have had a negative impact [55, 56]. This study found that there was a large gap between the consumption of the groups, with the poorest only consuming 22% of the proportional consumption of the wealthiest.

Among the demographic correlates of health is the cost of medical care [1, 2, 21, 22, 57, 58]. The current study concurs with the literature that the cost of medical care is associated with health status; but this is only for wealthy Jamaicans. Medical care expenditure was not associated with self-reported health for the poor to poorest in Jamaica.

Conclusion

The key finding which emerged from this is that social determinants of health are not always the same across different social hierarchies. The similarities in social determinants across the two social strata are age of respondents, health insurance coverage, and negative affective psychological conditions. Educational levels and living arrangements are not associated with health for men in the upper social strata, and consumption and medical expenditure are not for those in the lower social strata. This study adds to the literature by showing that social determinants of health are not the same in a particular cohort, or between different social strata.

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The authors have no conflict of interest to report.

References

1. World Health Organization (WHO). The Social Determinants of Health; 2008. (Accessed April 28,

- 2009, at: http://www.who.int/social_determinants/en/).
2. Kelly MP, Morgan A, Bonnefoy J, Butt J, Bergman V. The social determinants of health: Developing an evidence base for political action. Final Report to World Health Organization Commission on the Social Determinants of Health from Measurement and Evidence Knowledge Network; 2007. (Accessed April 29, 2009, at: http://www.who.int/social_determinants/resources/mekn_final_report_102007.pdf)
 3. United Nations Development Programme. Human development report 1997. New York: OUP; 1997.
 4. World Bank. Poverty Reduction and Human Resource Development in the Caribbean. Washington D.C.; 1996.
 5. Gafar J. Growth, inequality and poverty in selected Caribbean and Latin American countries, with emphasis on Guyana. *J Lat Am Stud* 1998; 30:591-617.
 6. Planning Institute of Jamaica (PIOJ), Statistical Institute of Jamaica (STATIN). Survey of Living Conditions, 2007. Kingston; PIOJ, STATIN; 2008.
 7. World Health Organization (WHO). Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, and June 19-22, 1946; In Basic Documents, 15th ed. Geneva, Switzerland: WHO, 1948.
 8. Graham H. Social Determinants and their Unequal Distribution Clarifying Policy Understanding The *Milbank Quarterly*, 82:101-124; 2004.
 9. Marmot M, Wilkinson RG (Eds.) *Social Determinants of Health*. 2nd Ed. Oxford University Press; 2003.
 10. Solar O, Irwin, A. *Towards a Conceptual Framework for Analysis and Action on the Social Determinants of Health*. 2005, Geneva: Commission on Social Determinants of Health; 2005.
 11. Murray S. Poverty and health. *Canad Med Associat J* 2006; 174: 923-923.
 12. Bloom DE, Canning D. The health and poverty of nations: From theory to practice. *J Hum Develop* 2003; 4: 47-72.
 13. Smith KR, Waitzman NJ. Double jeopardy: Interaction effects of marital and poverty status on the risk of mortality. *Demography* 1994; 31: 487-507.
 14. Pacione M. Urban environmental quality of human wellbeing—a social geographical perspective. *Landsc Urban Plan* 2003; 65: 19-30.
 15. Bourne P. Using the biopsychological model to evaluate the wellbeing of the Jamaican elderly. *West Indian Medical J* 2007; 56 (Suppl 3): 39-40.
 16. Benzeval M, Judge K, Shouls S. Understanding the relationship between income and health: How much can be gleaned from cross-sectional data? *Social policy and Administration* 2001. In Benzeval M, Judge K. *Income and health: the time dimension*. *Soc Sci Med* 2001; 52: 1371-1390.
 17. Pettigrew M, Whitehead M, McIntyre SJ, Graham H, Egan M. Evidence for Public Health Policy on Inequalities: 1: The Reality According To

- Policymakers. *J Epidemiol Community Health* 2004; 5:811 – 816.
18. House JA, Lantz PM, Herd P. Continuity and change in the social stratification of aging and health over the life course: Evidence from a nationally representative longitudinal study from 1986 to 2001/2002 (Americans' Changing Lives Study). *J Gerontol B Psychol Sci Soc Sci* 2005; 60B (Special Issue II): 15-26.
 19. Lloyd-Sherlock P. Old age and poverty in developing countries: new policy challenges. *World Dev* 2000; 28: 2157-2168.
 20. Statistical Institute Of Jamaica. Jamaica Survey of Living Conditions, 2007 [Computer file]. Kingston, Jamaica: Statistical Institute of Jamaica [producer], 2007. Kingston, Jamaica: Planning Institute of Jamaica and Derek Gordon Databank, University of the West Indies [distributors], 2008.
 21. Grossman M. The demand for health- a theoretical and empirical investigation. New York: National Bureau of Economic Research; 1972.
 22. Smith JP, Kington R. Demographic and economic correlates of health in old age. *Demography* 1997; 34: 159-170.
 23. Homer D, Lemeshow S. *Applied Logistic Regression*, 2nd edn. John Wiley & Sons Inc., New York; 2000.
 24. Cohen L, Holliday M. *Statistics for Social Sciences*. London, England: Harper and Row; 1982.
 25. Kashdan TB. The assessment of subjective well-being (issues raised by the Oxford Happiness Questionnaire). *Pers Individ Dif* 2004; 36: 1225-1232.
 26. Planning Institute of Jamaica (PIOJ). *Economic and Social Surveys, 2002*. Kingston; PIOJ; 2003.
 27. Desai MM, Zhang P, Hennessy CH. Surveillance for morbidity and mortality among older adults in United States, 1995-1996. *MMWR* 46(SS08): 7 - 25.
 28. World Health Organization. *Active ageing: a policy framework*. Geneva: WHO, 2002.
 29. Planning Institute of Jamaica (PIOJ), Statistical Institute of Jamaica (STATIN). *Jamaica Survey of Living Conditions 2002*. Kingston: PIOJ, STATIN, 2003.
 30. Maine Rural Health Research Centre, *Research and Policy Brief. Rural Residents more likely to be uninsured*, January 2009. (Accessed May 10, 2010, at <http://muskie.usm.maine.edu/Publications/rural/pb33.pdf>).
 31. Beck RW, Jijon CR, Edwards JB. The relationships among gender, perceived financial barriers to care, and health status in a rural population. *J Rural Health* 1996; 12: 188-196.
 32. Rowland D, Lyons B. Triple jeopardy: Rural, poor, and uninsured. *Health Serv Res* 1989; 23: 975-1004.
 33. Bennett K, Olatosi B, Probst J. *Health disparities: A rural-urban chart book*. Rural Health Research and Policy Centre, 2008.
 34. Warburton DE, Gledhill N, Quinney A. Musculoskeletal fitness and health. *Can J Appl Physiol* 2001; 26: 217-237.
 35. Lyubomirsky S. Why are some people happier than others? The role of cognitive and motivational process in well-being. *Am Psychol* 2001; 56: 239-249.
 36. Diener E, Horwitz J, Emmon RA. Happiness of the very wealthy. *Social Indicators Research* 1985; 16: 263-274.
 37. Harris L, Peter R, Lightsey Jr., OR. Constructive thinking as a mediator of the relationship between extraversion, neuroticism, and subjective well-being. *Eur J Pers* 2005; 19: 409-426.
 38. Fromson PM. Self-discrepancies and negative affect: The moderating roles of private and public self-consciousness. *Soc Behav Pers* 2006; 34: 333-350.
 39. McCullough ME, Bellah CG, Kilpatrick SD, Johnson JL. Vengefulness: Relationships with Forgiveness, Rumination, Well-Being, and the Big Five. *Pers Soc Psychol Bull* 2001; 27: 601-610.
 40. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS Scale. *J Pers Soc Psychol* 1988; 54: 1063-1070.
 41. Wang J, Jamison DT, Bos E, Preker A, Peabody J. Measuring country performance on health: Selected indicators for 115 Countries: 11-19. *Human Development Network: Health, Nutrition and Population Series*, Washington, DC: The World Bank, Health, Nutrition and Population, May 1999, 359 pages.
 42. Elo IT, Preston SH. Educational differentials in mortality in the United States, 1979-85. *Soc Sci Med* 1996; 42: 47-57.
 43. Stern PC, Carstensen LL, eds. *The Aging Mind. Opportunities in Cognitive Research*, National Research Council, Washington, DC: National Academy Press, 2000.
 44. Geronimus AT, Hicken M, Keene D, Bound J. Weathering and age patterns of allostatic load scores among blacks and whites in the United States. *Am J Public Health* 2006; 96: 826-833.
 45. Hayward MD, Crimmins EM, Miles TP, Yu Y. The significance of socioeconomic status in explaining the racial gap in chronic health conditions. *Am Sociol Rev* 2000; 65: 910-930.
 46. Seeman T, Stein-Merkin S, Crimmins E, Koretz B, Crette S, Karlamangla A. Education, income and ethnic differences in cumulative biological risk profiles in a national sample of US adults: NHANES III (1988 – 1994). *Soc Sci Med* 2008; 66: 72-87.
 47. Choi, S-J. Ageing and Social Welfare in South Korea, pp. 148-66 in David R. Phillips, ed., *Ageing in East and South-East Asia*, Suffolk: Edward Arnold, 1992.
 48. Smith KR, Waitzman NJ. Double jeopardy: Interaction effects of marital and poverty status on the risk of mortality. *Demography* 1994; 31:487-507.
 49. Lillard LA, Panis CWA. Marital status and mortality: The role of health. *Demography* 1996; 33:313-327.

50. Ross CE, Mirowsky J, Goldsteen K. The impact of the family on health. *J Marriage Fam* 1990; 52:1059-1078.
51. Gore WR. Sex, marital status, and mortality. *Am J Sociol* 1973; 79:45-67.
52. United Nations. Country Profile - Status and implementation of national policies on ageing in Jamaica, 2003. (Accessed May 12, 2010, at: www.un.org/ageing/documents/workshops/Vienna/jamaica.pdf).
53. Pimple F, Rogers R. Socioeconomic Status, Smoking and Health: A Test of Competing Theories of Cumulative Advantage. *J Health Soc Behav* 2004; 45: 306-321.
54. Sobal J, Stunkard AJ. Socioeconomic status and obesity: a review of the literature. *Psychol Bull* 1989; 105: 260-275.
55. Astrup A, Finer N. Redefining Type 2 diabetes: Diabetes or obesity dependent diabetes. *Obes Rev* 2001; 1: 57 - 59.
56. Morrison E. Diabetes and hypertension: Twin trouble. *Cajanus* 2000; 33:61-63.
57. Bourne PA, McGrowder DA. Rural health in Jamaica: examining and refining the predictive factors of good health status of rural residents. *Rural Remote Health* 2009; 9: 1116.
58. Bourne PA. Health Determinants: Using secondary data to model predictors of well-being of Jamaicans. *West Indian Med J* 2008; 57:476-481.
59. Wilkinson R, Marmot M, (eds). *Social determinants of health: the solid facts*. 2nd Edition, WHO: Copenhagen; 2003 ((Accessed May 8, 2010, at: <http://www.euro.who.int/document/e81384.pdf>).