

# Hypertensive And Modeling Their Social Determinants Of Self-Rated Health Status In A Middle-Income Developing Nation

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## ABSTRACT

**Introduction:** A piecemeal approach has been taken in studies on hypertension, but there is a void in the literature on (1) the socio-demographic profile of those with the disease in a Latin American and Caribbean nation, (2) healthcare seeking behaviour, (3) healthcare utilization, and (4) modelling the social determinants of self-rated health status. **Objective:** The aim of this study was to elucidate information on hypertension and the socio-demographic profile of those with the disease in a Latin American and Caribbean nation, as well as to model the self-rated health status of the hypertensives. **Materials and methods:** The current study used the 2007 Jamaica Survey of Living Conditions dataset to carry out the analyses. This study extracted a sub-sample of 206 respondents, who indicated being diagnosed with hypertension, from a larger, nationally cross-sectional survey. **Statistical Analyses:** The Statistical Package for the Social Sciences for Windows, Version 16.0

(SPSS Inc; Chicago, IL, USA), and STATA were used to analyze the data. Multiple logistic regressions were used to analyze the possible explanatory variables of self-rated health status. **Results:** Twenty-seven in every 100 hypertensive persons had at least a good self-rated health status. The current study found that 2.5 times more females than males were affected by hypertension; and that the hypertensives were more likely to: be married, be elderly, utilise private health care facilities, record moderate health status, be in the lower socioeconomic strata, and be rural dwellers. Most had sought medical care during the last 4-week period. Rural hypertensives recorded the greatest very poor health status, and two variables emerged as statistically significant factors of the self-rated health status of the hypertensives in Jamaica. **Conclusion:** Our findings have provided policy makers with evidence that can be used to enhance policy formulation and intervention programmes.

**Key Words:** Hypertension, married people, rural residents, self-rated health status, social determinants of health status, health care utilization, Jamaica

## INTRODUCTION

The statistics of 2007 revealed that there were 2,682,120 Jamaicans (end of the year population) [1], of whom 22.4% had hypertension [2]. A study which was conducted in 2007/2008 on Jamaicans between 15 and 74 years of age, found that 25% of the population had hypertension as well as obesity [3]. This denotes that between 1 in 5 and 1 in 4 of the Jamaicans are living with at least one chronic illness [2], [3]. In the 1950s, tuberculosis, heart diseases, nephritis, syphilis, pneumonia and influenza were the leading causes of mortality in the Caribbean, and in the 1980s, a shift occurred, which saw cardiovascular diseases, heart diseases, malignant neoplasms, hypertension and diabetes being the leading causes of death. Another shift was observed in the 1990s, when malignant neoplasms, cardiovascular diseases, diabetes mellitus, ischaemic heart disease, other heart diseases and hypertension were among the 10 ten leading causes of death. In 2007, hypertension stood as the third leading cause of mortality in females and as the 6th cause in males. Hypertension is not only a silent killer; it is an epidemic and needs to be examined as such, in the developing world.

Globally, chronic diseases account for 60% of the deaths, and this is as high as 80% in low-to-middle income nations [4]. Jamaica, like the rest of the developing world, is experiencing an epidemic in cardiovascular diseases, as they are the leading causes of mortality [5], but despite this reality, obesity is the studied epidemic in the Americas, and not the face behind hypertension [6]. While 11 to 21% of the Latinos in the Americas are obese, obesity accounts for between 20 to 33 1/3% of the populations in Chile, Jamaica,

Mexico, Peru and Venezuela [3], [5]. Hypertension, on the other hand, increases exponentially in the middle to the late ages and accounts for more deaths in the world as well as in developing countries, than obesity.

Diabetes, cardiovascular disease, cancers, and hypertension are among the main causes of death in the world, except in South Asia and sub-Saharan Africa. The sedentary lifestyle of the urban dwellers explains much of the chronic illness in the world and in 2030, with 80% of the globe's population residing in cities as compared to over 50% in 2008, more people will be expected to die from chronic diseases. Urban zones continue to attract many people and some of them being poor, will not be able to change their lifestyles (cigarette consumption, sugar, diet, saturated fat and environmental factors) like the wealthy. While urban settings appeal to too many people, the better the financial pull factors appear to people, does not mean that they will have less chronic illness. In fact, it is well established that there is a direct relationship between poverty and chronic illness [7- 9], which suggests that those in the lower socioeconomic strata in the developing world will in the future also be vulnerable to more illnesses, and in particular, chronic diseases, despite the urban-rural migration.

In 1998, Forrester et al. [10], by using hypertension as an indicator of the emergence of chronic cardiovascular diseases, found that early blood pressure problems were virtually non-existent in rural Africans, and that they were modest in Caribbean people. They noted however, that in recent times, hypertension in Nigeria, Jamaica and the US has seen remarkably steep gradients. In Jamaica [2],[3], as in

Nigeria, hypertension is an important cardiovascular risk factor which affects between 20-25% of the population [11]. Clearly, hypertension in Jamaica as well as in some nations in Africa is a silent epidemic [12], and while researchers have recognized this as the case in the latter state, those in the former are still to admit this reality.

Studies on hypertension have shown differences between the areas of residence [13], [14], stressors [15], diet [16], Western lifestyle [10], sex [17], measurement and treatment [18], and educational level [19], [20], income [20] and advanced aging [21-23]. Since blood pressure was measured for the first time in 1733 by Stephen Hales, many piecemeal studies have been conducted on this matter. An extensive research of the literature unearthed no study on self-reported hypertension that evaluates who hypertensives are, as well as on the modelling of their self-rated health status. In 2001, Swab et al. [24] stated that 3 in every 10 Jamaicans (ages 30+ years) had hypertension, and that in 2007, 1 out of every 4 Jamaicans had the disease. The face of hypertension is no longer middle-to-late ages in Jamaica, as the current study found; that 2.9% were young adults (15-30 years).

Chronic diseases are the next tsunami which the developing countries are facing. The swelling increases in those conditions, and in particular, the high prevalence of hypertension, which is a predisposing factor for cardiovascular diseases [25], [26]; highlight the importance of a comprehensive study on the face of the hypertensive person. This is no longer a silent epidemic, as mortality figures indicate that a 'red alert' needs to be sounded for hypertension among the other chronic ailments in developing countries. If the 'Rule of Halves' (half of those detected are treated or controlled) holds true [27-29], hypertension requires an immediate assessment of the sociodemographic characteristics and the health status of its patients. Thus, the aim of this study was to elucidate information on hypertension and the socio-demographic profile of those with the disease in a Latin American and Caribbean nation, as well as to model the self-rated health status of hypertensives.

## METHODS AND MATERIALS

### Sample

The current study used the 2007 Jamaica Survey of Living Condition (JSLC) dataset to carry out the analyses. The 2007 JSLC was conducted in May and August of that year. The current study extracted a sub-sample of 206 respondents who indicated being diagnosed with hypertension from a larger, 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).

The PIOJ and STATIN are non-profit organizations focusing on data collection and policy assessment, and they 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 [30].

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 [30, 31]. The sample was weighted to reflect the population of the nation.

## MEASUREMENT

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: children (ages less than 15 years); young adults (ages 15 to 30 years); other-aged adults (ages 31 to 59 years); young elderly (ages 60 to 74 years); old elderly (ages 75 to 84 years) and oldest elderly (ages 85 years and older).

For self-reported illness (or self-reported dysfunction), the question was asked: "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.

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. For this study, the construct was categorized into 3 groups – (i) good; (ii) fair, and (iii) poor. A binary variable was later created from this variable (1 = good and fair, 0 = otherwise) [32-34].

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

Income was measured by assessing the total expenditure.

## ANALYTIC MODEL

By using econometric analyses (multiple logistic regressions), Bourne and McGrowder [27] modeled the social determinants of the health of rural Jamaicans. The chosen method allowed for the testing of many possible variables which accounted for the health status, which was measured as a binary variable. The literature has shown that health status can be dichotomized into good-to-very good health status and poor-to-moderate health status [32-34]. Clearly, based on the 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 best fitted into good-to-very good health status. Thus, for this study, the dichotomization of the health status was moderate-to-very good and very poor-to-poor. Furthermore, the selected variables which were used in this model building were based on the established evidence on the social determinants of health. Some modifications were made to Bourne and McGrowder's model, as not all the variables which emerged in that model were applicable for the current work. In this model building, the variables were entered into a block, from which the significant ones emerged as the factors which accounted for the moderate-to-very good health status of the hypertensives in Jamaica.

## STATISTICAL ANALYSIS

We used the SPSS computer statistical package, Version 16.0 (SPSS Inc; Chicago, IL, USA), and STATA. Cross tabulations were performed in order to examine demographics, health, and particular variables, and where 33.3% of the cells were less than 5 data vales, the Fisher exact test was used instead of Chi-square. Multiple logistic regressions were

used to analyze the possible explanatory variables (health care-seeking behaviour in the last 4 weeks, health insurance coverage, medical expenditure, marital status, income, area of residence, sex, household head and age) of self-rated health status. The results were presented by using  $\beta$  coefficients, Wald statistics, and Odds ratio, with a confidence interval of 95% (CI 95%). The predictive power of the model was tested by using the Omnibus Test. The model of Hosmer and Lemeshow [36] was used to examine the goodness of the fit of our model. In order to develop accurate tests for statistical significance, the researchers used the SUDAAN statistical software (Research Triangle Institute, Research Park, NC; 1989) which was adjusted for the survey's complex sampling design [37]. A p-value < 0.05 was selected to indicate statistical significance. The final model was based on those variables that were statistically significant ( $p < 0.05$ ). The categorical variables were coded by using the 'dummy coding' scheme.

Where collinearity existed ( $r > 0.7$ ), the variables were entered independently into the model to determine as to which of those should be retained during the final model construction. The final decision on whether or not to retain the variables was based on the variables' contribution to the predictive power of the model and its goodness of fit [38].

## RESULTS

[Table/Fig 1] presents information on the sociodemographic characteristics of the sample, illness, health care utilisation, and health care-seeking behaviour. The sample was 206 respondents (mean age = 62.5 years  $\pm$  16.8 years). Twenty-eight percent of the respondents had health insurance coverage (private, 8.3%). The majority of the respondents indicated a fair self-rated health status (44.2%) as compared to 26.7% who said at least good (very good, 4.9%) and 29.1% who mentioned at least poor (very poor, 3.9%). Most of the sample purchased the prescribed medication (70.2%), and 3.9% had been involved in an accident in the last 4 weeks. The preferred health care utilisation of the sample was private health facilities (including hospitals, 55.2%). Predominantly, the face of hypertension in Jamaica was elderly (60+ years, 60.2%). The average number of visits to medical practitioners(s) in the last 4 weeks were 1.3 (SD = 0.7); and the mean length of illness of the sample was 24.8 days (SD = 85.3 days). The mean cost of private medical expenditure (USD 15.54 $\pm$  36.95) was 3.7 times more than that used for public medical expenses – (US \$1.00 = Ja. \$80.47, in 2007).

[Table/Fig 2] examines the sociodemographic characteristics and health care utilisation by self-rated health status. A significant statistical association emerged between the area of residence and self-rated health status ( $\chi^2 = 24.69$ ,  $P = 0.002$ , contingency coefficient = 0.33).

[Table/Fig 3] presents information on the sociodemographic characteristics and health care utilisation by the population income quintile of the sample.

No significant statistical association existed between self-reported illness and self-rated health status ( $\chi^2 = 2.98$ ,  $P = 0.562$ ); between health care-seeking behaviour and population income quintile ( $\chi^2 = 5.49$ ,  $P = 0.241$ ), as well as between health care-seeking behaviour and sex ( $\chi^2 = 0.072$ ,  $P = 0.788$ ).

### Sociodemographic characteristics and health care utilization by self-rated health status

[Table/Fig 4] presents information on the health care-seeking behaviour of people in different marital statuses and the sex of the respondents. Married people had sought the most medical care

Characteristic	n	%
<b>Sex</b>		
Male	58	28.2
Female	148	71.8
<b>Marital status</b>		
Married	91	44.4
Never married	69	33.7
Divorced	3	1.5
Separated	5	2.4
Widowed	37	18.0
<b>Partner in household</b>		
Yes	93	45.1
No	12	5.8
Did not respond	105	51.0
<b>Social assistance (PATH)</b>		
Yes	41	19.9
No	165	80.1
<b>Area of residence</b>		
Urban	47	22.8
Semi-urban	41	19.9
Rural	118	57.3
<b>Population income quintile</b>		
Poorest 20%	47	22.8
Poor	35	17.0
Middle	48	23.3
Second wealthy	38	18.4
Wealthiest 20%	38	18.4
<b>Age cohort</b>		
Young adults	6	2.9
Other aged adults	76	36.9
Young-old	61	29.6
Old-old	49	23.8
Oldest-old	14	6.8
<b>Illness (self-reported)</b>		
Yes	205	99.5
No	1	0.5
<b>Health care seeking behaviour</b>		
Yes	140	68.6
No	64	31.4
<b>Health care utilization</b>		
Public hospital	35	22.7
Private hospital	7	4.5
Public health centre	34	22.1
Private health centre	78	50.7

[Table/Fig 1]: Sociodemographic characteristics of study population, n = 206

(42.1%) in the last 4 weeks, as compared to the never married people (36.4%) and those in other social partnerships. Married men were 2.2 times more likely to have visited a health care practitioner in the last 4 weeks as compared to never-married men.

## MULTIVARIATE ANALYSES

By using logistic regression analyses, one variable emerged as a statistically significant factor of the self-rated health status of

Characteristic	Self-reported health status				
	Very good	Good	Fair	Poor	Very poor
	n (%)	n (%)	n (%)	n (%)	n (%)
<b>Area of residence*</b>					
Urban	1 (10.0)	13 (28.9)	26 (28.6)	7 (13.5)	0 (0.0)
Semi-urban	5 (50.0)	6 (13.3)	24 (26.4)	5 (9.6)	1 (12.5)
Rural	4 (40.0)	26 (57.8)	41 (45.1)	40 (76.9)	7 (87.5)
<b>Population income quintile</b>					
Poorest 20%	1 (10.0)	9 (20.0)	22 (24.2)	13 (25.0)	2 (25.0)
Second poor	1 (10.0)	8 (17.8)	16 (17.6)	8 (15.4)	2 (25.0)
Middle	2 (20.0)	11 (24.4)	17 (18.7)	16 (30.8)	2 (25.0)
Second wealthy	2 (20.0)	7 (15.6)	19 (20.9)	9 (17.3)	1 (12.5)
Wealthiest 20%	4 (40.0)	10 (22.2)	17 (18.7)	6 (11.5)	1 (12.5)
<b>Health care seeking behaviour</b>					
No	3 (30.0)	21 (46.7)	22 (24.7)	16 (30.8)	2 (25.0)
Yes	7 (70.0)	24 (53.3)	67 (75.3)	36 (69.2)	6 (75.0)
<b>Age cohort</b>					
Young adults	1 (10.0)	3 (6.7)	2 (2.2)	0 (0.0)	0 (0.0)
Other aged adults	6 (60.0)	20 (44.4)	34 (37.4)	16 (30.8)	0 (0.0)
Young-old	2 (20.0)	14 (31.1)	26 (28.6)	17 (32.7)	2 (25.0)
Old-old	0 (0.0)	6 (13.3)	22 (24.2)	16 (30.8)	5 (62.5)
Oldest-old	1 (10.0)	2 (4.4)	7 (7.7)	3 (5.8)	1 (12.5)
<b>Sex</b>					
Male	3 (30.0)	8 (17.8)	26 (28.6)	17 (32.7)	4 (50.0)
Female	7 (70.0)	37 (82.2)	65 (71.4)	35 (67.3)	4 (50.0)
<b>Marital status</b>					
Married	3 (33.3)	16 (35.6)	43 (47.3)	25 (48.1)	4 (50.0)
Never married	6 (66.7)	21 (46.7)	28 (30.8)	14 (26.9)	0 (0.0)
Divorced	0 (0.0)	1 (2.2)	1 (1.1)	1 (1.9)	0 (0.0)
Separated	0 (0.0)	1 (2.2)	1 (1.1)	2 (3.8)	1 (12.5)
Widowed	0 (0.0)	6 (13.3)	18 (19.8)	10 (19.2)	1 (12.5)

[Table/Fig 2]: Sociodemographic characteristics and health care utilization by self-rated health status \*P < 0.05

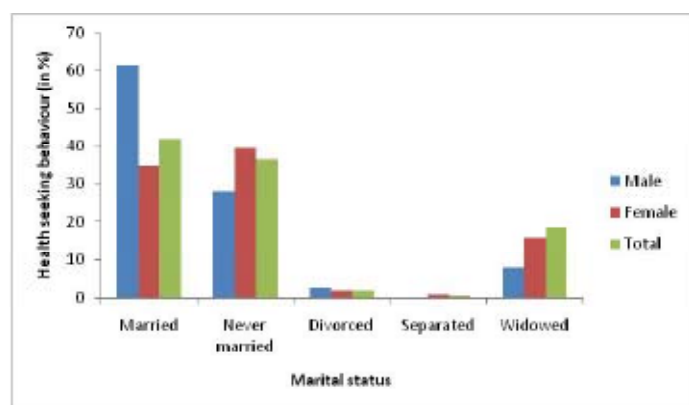
hypertensive Jamaicans (Table 3): area of residence (urban: OR = 4.15, 95% CI = 1.44 – 11.97; other towns: OR = 3.47, 95% CI = 1.23 – 9.78). The model had a statistically significant associative power (Model  $\chi^2 = 32.6$ , P = 0.003; Hosmer and Lemeshow goodness of fit  $\chi^2 = 9.6$  (8), P = 0.8), and it correctly classified 75.1% of the sample (correctly classified 93.4% of those who self-rated their health as moderate-to-very good and 31.6% of those who self-rated their health as poor-to-very poor).

## DISCUSSION

Diabetes mellitus, cardiovascular diseases and neoplasms are among the leading causes of mortality in the world, and more so, in the developing countries. While infectious diseases, low nutrient intake, and accidents continue to claim lives, chronic conditions are rising faster and will account for more deaths in the future. Despite this reality, hypertension, which is an important cardiovascular risk factor, did not have a clear face, nor did the factors which explained the self-rated health status of this group. The current study found that 2.5 times more females than males were affected by hypertension; and the hypertensives were more likely to be married, elderly, to utilise private health care facilities, to record moderate health status and to

Characteristic	Population Income Quintile				
	Poorest 20%	Second poor	Middle	Second wealthy	Wealthiest 20%
	n (%)	n (%)	n (%)	n (%)	n (%)
<b>Area of residence</b>					
Urban	3 (6.4)	8 (22.8)	5 (10.4)	10 (26.3)	21 (55.3)
Semi-urban	7 (14.9)	3 (8.6)	16 (22.9)	12 (31.6)	8 (21.0)
Rural	37 (78.7)	24 (68.6)	32 (66.7)	16 (42.1)	9 (23.7)
<b>Health care seeking behaviour</b>					
No	26 (56.5)	27 (77.1)	32 (66.7)	26 (70.3)	29 (76.3)
Yes	20 (43.5)	8 (22.9)	16 (33.3)	11 (29.7)	9 (23.7)
<b>Age cohort</b>					
Young adults	1 (2.2)	0 (0.0)	1 (2.1)	1 (2.7)	3 (7.9)
Other aged adults	14 (29.8)	12 (34.3)	15 (31.3)	17 (44.7)	18 (47.4)
Young-old	16 (34.0)	10 (28.6)	13 (27.1)	9 (23.7)	13 (34.2)
Old-old	12 (25.5)	8 (22.8)	15 (31.2)	11 (28.9)	3 (7.9)
Oldest-old	4 (8.5)	5 (14.3)	4 (8.3)	0 (0.0)	1 (2.6)
<b>Sex</b>					
Male	12 (25.5)	8 (22.9)	10 (20.8)	14 (36.8)	14 (36.8)
Female	35 (74.5)	27 (77.1)	38 (79.2)	24 (63.2)	24 (63.2)
<b>Marital status</b>					
Married	19 (40.3)	17 (50.0)	20 (41.7)	19 (50.0)	16 (42.1)
Never married	18 (38.3)	10 (29.4)	13 (27.1)	12 (31.6)	16 (42.1)
Divorced	1 (2.1)	0 (0.0)	0 (0.0)	1 (2.6)	1 (2.6)
Separated	1 (2.1)	0 (0.0)	2 (4.1)	2 (5.3)	0 (0.0)
Widowed	8 (17.0)	7 (20.6)	13 (27.1)	4 (10.5)	5 (13.2)
<b>Self-reported illness</b>					
Yes	47 (100.0)	35 (100.0)	47 (97.9)	38 (100.0)	38 (100.0)
No	0 (0.0)	0 (0.0)	1 (2.1)	0 (0.0)	0 (0.0)
<b>Health Insurance* – no coverage</b>					
private	1 (2.1)	3 (8.6)	0 (0.0)	6 (15.8)	7 (18.4)
public	8 (17.0)	9 (25.7)	10 (20.8)	5 (13.2)	9 (23.7)

[Table/Fig 3]: Sociodemographic characteristics and health care utilization by Population Income Quintile \*P < 0.05



[Table/Fig 4]: Health seeking behaviour (in %) by marital status and sex

be in the lower socioeconomic strata or to be rural dwellers. Most had sought medical care in the last 4 weeks, rural hypertensives recorded the greatest very poor health status, and two variables emerged as the statistically significant factors of the self-rated health status of the hypertensives in Jamaica.

Variable	$\beta$ Coefficient	Std. error	Wald statistic	Odds ratio	CI (95%)
Health seeking behaviour	-0.57	0.41	1.99	0.57	0.26 - 1.25
Health insurance (1=Yes)	0.04	0.41	0.01	1.04	0.47 - 2.31
Logged medical expenses	-0.36	0.19	3.41	0.70	0.48 - 1.02
Never married (reference)				1.00	
Married	-0.48	0.44	1.19	0.62	0.26 - 1.47
Divorced, separated or widowed	-0.75	0.55	1.87	0.48	0.16 - 1.38
Lower class (reference)				1.00	
Middle class	-0.09	0.49	0.03	0.92	0.35 - 2.39
Upper class	0.03	0.61	0.00	1.03	0.31 - 3.41
Logged income	0.06	0.54	0.01	1.07	0.37 - 3.07
Rural area (reference)				1.00	
Urban area	1.42	0.54	6.92	4.15**	1.44 - 11.97
Other town	1.24	0.53	5.51	3.47*	1.23 - 9.78
Sex (1= male)	-0.31	0.42	0.53	0.74	0.32 - 1.68
Household head	-0.26	0.41	0.38	0.76	0.35 - 1.74
Age	-0.02	0.01	1.21	0.99	0.96 - 1.01

- ♦ Model chi-square = 32.6, P = 0.003
- ♦ Hosmer and Lemeshow goodness of fit  $\chi^2 = 9.6$  (8), P = 0.8
- ♦ -2Log Likelihood = 201.7
- ♦ Nagelkerke R<sup>2</sup> = 0.22
- ♦ Overall correct classification = 75.1%
- ♦ Correct classification of cases of self-rated moderate-to-very good health status = 93.4%
- ♦ Correct classification of cases of self-rated poor-to-very poor health status = 31.6%

\* P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001

**[Table/Fig 5]:** Logistic regression: Variables of self-rated health status

More Jamaicans have hypertension than any other type of chronic condition; yet more extensive and comprehensive studies have been conducted on diabetes, heart disease, neoplasms and arthritis. Traditionally, chronic diseases were viewed as middle-to-late life ailments, but there is a growing decrease in the age of contracting those conditions. In this paper, the findings concur with the literature that hypertension is a middle-to-late life ailment [20-23], as 97 out of every 100 hypertensive persons were aged 31+ years and 60 out of every 100 were aged 60+ years old. What is evident is that 3 out of every 100 hypertensives were 15-30 years old, which supported the changing image of hypertension, and how we researched this fact. Studies have used the 30+ years old age group to examine chronic illness [24], which means that public health planning, relying on research, will be under-planning for a critical cohort in the population.

Public health planners use information from within and outside of their geopolitical boundaries to enhance decision-making. While outside information affords a pertinent source of data in understanding a phenomenon, this may not provide the correct knowledge about a localized group with different socioeconomic, biological and environmental conditions. Urbanization is well established in the literature as having a key role to play in human health conditions such as hypertension, diabetes mellitus and other chronic ailments. While urbanisation affects people's lifestyles with respect to the food that they eat, where they work, the surrounding environmental conditions, the concerns that they are exposed to, and their sedentary lifestyles, with almost 50% of the Jamaicans residing in cities, 6 out of every 10 hypertensive persons in this nation dwells in urban zones.

Clearly, low nutritional intake and poverty account for more hypertensive people than the 'bad' elements of urbanization. In Jamaica, statistics revealed that 71% of the poverty is existent in the rural areas [2]. Poverty means the incapacitation of the financial resources, material deprivation, nutritional deficiency and environmental degradation, which are associated with a lower health status and higher morbidity and mortality. Those realities form the core of the rationale for the developing nations, having more deaths owing to chronic illness than the developed world. A study by Van et al. [7] found that chronically ill people in the Netherlands were

more likely to be poor, thus suggesting that material deprivation was directly associated with particular health conditions. This research concurs with Van et al.'s work, and went further to find that poverty was associated with the area of residence; area of residence was related to illness, and by extension, hypertension was higher among the rural respondents.

Smith and Kington [39] postulated that money is able to buy health, from which it can be extrapolated that poverty is associated with low health, increased morbidity and mortality. While their argument is not entirely true, as health is not exchangeable (cannot be bought), money provides access to better nutrition, lifestyle, choice of health care services, good sanitation and physical milieu, which otherwise is difficult for the poor to obtain without governmental or other interventions. In this study, 40 out of every 100 hypertensive persons were poor as compared to 37 out of every 100 in the wealthy social strata, which somewhat supports Smith and Kington's postulation. So, when it is said that chronic illness is becoming the next tsunami in the developing countries, the swelling increases in chronic illness, and in particular, hypertension, are more evident among those in the lower socioeconomic group in those societies.

The push-pull factors which are associated with migration in developing countries are accounted for by poverty, among other psychosocial conditions. Poverty hinders opportunity, life expectancy, quality of life and economic progress, and brings nutritional deficiencies, and material deprivation, which are the very reasons that pull the rural residents to the urban areas. In this research, urban dwellers were 4.1 times more likely to record a moderate-to-very good self-rated health status than their rural counterparts; and those who lived in the semi-urban areas were 3.5 times more likely to have a greater moderate-to-excellent self-rated health status. Material deprivation in the rural areas in Jamaica is accounting for more morbidity and low health status, and clearly, this will be a push factor for the urban-rural migration, despite the negatives of urban living.

In this study, no significant statistical relationship existed between health care-seeking behaviour and the population income quintile (social standing). This may appear to be paradoxical, as financial deprivation affects people's ability to afford health care, and rightfully so, but since 2005, the Jamaican government has instituted free

health care in all public hospitals, except the University Hospital of the West Indies, which means that money will influence the choice of care and not that of the health care demand. This therefore accounts for the greater percentage of hypertensives having sought medical care in the last 4 weeks (68%) as compared to the population (66%) [2]. Despite the removal of access fees from public health care institutions, there is a preference for private health care utilisation.

The preference for private health care utilisation among hypertensives is embedded in long queues, low privacy, the social treatment of the patients, and milieu – the environment of public health care facilities - that push people into the private health care demand. The reality still exists that public health care is the choice for 44 out of every 100 hypertensive Jamaicans, thus suggesting that public health will be required to plan for this group. While the onset of hypertension commences at the age of 15 years in Jamaica, the non-children public health care system needs to cater to this cohort, as their choices, lifestyle, demands and tolerance for disrespectful behaviour are not the same as the elderly or the middle-aged adults.

A public health concern is the ratio of males to females with hypertension in Jamaica. Swaby et al. [24] opined that there was a preponderance of females with chronic illness and seeking treatment for chronic illness, as compared to males, but this study found that the disparity was as much as 2.5 females to 1 male (with respect to hypertension). There was no statistical association between the health care-seeking behaviour of males (67.2%) and the female hypertensives (69.2%) in Jamaica, which refutes Swaby et al.'s [24] earlier findings. Furthermore, the preponderance of females to males with hypertension accounts for as to why this health condition is the third leading cause of mortality in the former, and the sixth leading cause in the latter group.

Hypertension is brought on by various stressors in lifestyle practices, and with the influx of females into the labour force, top managerial positions, higher education and single parenthood, they are now exposing themselves to the risk factors which were associated with those social roles that were once dominated by males. Statistics reveal that the unemployment rate for females (14.3%) is 2.6 times more than that for males [40], indicating that unemployment, as well as other types of social deprivation, are associated with greater hypertension among females. A study by Atallah et al. [41] found that hypertension was greater among unemployed Caribbean people than those who were employed, which also emerged in the current research. The unemployed females are vulnerable to the dictates of males, and during this period, there are the social challenges of child rearing for mothers, the psychological stressors of unemployment, the psychological situation of a dictatorial male, the material deprivation and dietary deficiency, and these influence the higher blood pressure count which is seen in them, as compared to males.

The 21st Century has brought with it urbanization, lifestyle and role changes, and the risk factors which are related to chronic diseases for many Caribbean peoples, as well as the economic burden of chronic illnesses such as diabetes mellitus and hypertension. For some time now, Caribbean governments have instituted data collection units to examine epidemiological data [42] on the prevalence of hypertension, gender-specific population and age-specific mortality, but for the purpose of effective public health policy planning, more information is needed on the face behind hypertension. The current work opens a comprehensive discussion and analysis of the hypertensives in Jamaica, and while economic development is associated with economic growth, the increased employment of females in the labour force means lower male dependency, and while money reduces

material deprivation, the side effect is increased hypertension among this group.

Interestingly, in this study, it was found that there was a greater prevalence of hypertension among married than non-married Jamaicans, but there was no difference in the self-rated health status between the groups. According to Smith and Waitzman [43] "many observers have theorized that married individuals have access to more informal social support than do non-married individuals", which explains the social reality of a higher quality of life for married couples than for 'non-married' individuals [44]. Furthermore, studies have shown that married people have a lower mortality risk in the healthy category than the 'non-married' ones [45], and this justifies as to why they take less life-threatening risks [46]. Clearly, the benefits of marriage, as put forward by other scholars, do not provide protection from hypertension among this cohort. In fact, they recorded a greater prevalence of hypertension than other marital states.

Married people are more likely to seek medical care than non-married people, and this accounts for the greater prevalence of hypertension among them. Although males do not like to seek medical care, those who are married, seek more care on the request of their wives, which accounted substantially for more of them visiting a medical practitioner in the last 4-week period, as compared to those who were never married. Smith and Waitzman [43] opined that the wives were found to dissuade their husbands from particular risky behaviours such as the use of alcohol and drugs, and that they would ensure that they maintained a strict medical regimen coupled with proper eating habits. With more married people utilising health care services, this means that more non-married Jamaicans would have been ill, but may have not yet been diagnosed. If the 'Rule of Halves' (half of those detected are treated or controlled) holds true [27-29], the greater prevalence of hypertension among married people is as a result of the greater half seeking more medical care than the non-married people. This speaks about a public health problem, as the treatment and the prevalence of hypertension are undoubtedly greater than the percentage which has been currently planned for in the nation.

There is a need to have more people seeking medical care, but this must be done in a holistic way, as has been outlined earlier from the findings of this paper. The hypertension epidemic has been clearly highlighted as an important public health problem, but in order to effectively combat this reality, poverty, opportunity, social exclusion, unemployment, malnutrition, disease management, early testing and lifestyle practices must be coalesced by health planners. A study as early as in the 1980s had stated that hypertension was the most prevalent chronic illness in the West Indies [47] and in 2000, Barcelo [48] called it a silent killer, but researchers have continued to examine its aetiology, management and programmes and even a study conducted in 2007/08 [3], like its predecessors, used the standard age-specific, gender and education-specific conditions.

The social explanations are rarely examined, and when done, the traditional variables (age, gender, and educational level) are examined by scholars, instead of the more demographic variables such as marital status, area of residence, social class and health care utilisation, as well as self-rated health status. This study is more comprehensive than other studies and it provides the research experts with a social justification for the face behind hypertension in Jamaica. It should be used to help the public health practitioners, policy makers and governments to understand the complexity of effectively implementing programmes to address the management of hypertension, as well as other chronic illnesses. Poverty is the

underlying challenge to greater health in the population, despite the gains of economic development, growth, removal of health care user fees, and social programmes.

## CONCLUSION

In summary, the current evidence shows that hypertension has changed, when comparing the traditional late life disease to the middle-to-late years, and that it mostly affects females, rural residents and married respondents and marginally inflects the poor more than those in the wealthy social strata. The social determinants of self-rated health status are fundamentally different from those which are identified in the literature among the population, or in other sub-populations.

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