

# An epidemiological transition of health conditions, and health status of the old-old-to-oldest-old in Jamaica: a comparative analysis

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## Abstract

**Background:** There is a paucity of information on the old-old-to-oldest-old in Jamaica. In spite of studies on this cohort, there has never been an examination of the epidemiological transition in health condition affect this age cohort. **Objectives:** The aims of the current study are 1) provide an epidemiological profile of health conditions affecting Jamaicans 75+ years, 2) examine whether there is an epidemiological transition in health conditions affecting old-old-to-oldest-old Jamaicans, 3) evaluate particular demographic characteristics and health conditions of this cohort, 4) assess whether current self-reported illness is strongly correlated with current health status, 5) mean age of those with particular health conditions, 6) model health status and 7) provide valuable information upon which health practitioners and public health specialists can make more informed decisions. **Method:** The current study utilized a sub-sample of approximately 4% from each national cross-sectional survey that was conducted in 2002 and 2007. The sub-sample was 282 people ages 75+ years from the 6,783 respondents surveyed for 2007 and 1,069 people ages 75+ years from the 25,018 respondents surveyed for 2002. **Results:** In 2007, 44% of old-to-oldest-old Jamaicans were diagnosed with hypertension, which represents a 5% decline over 2002. The number of cases of diabetes mellitus increased over 570% in the studied period. The poor indicated having more health conditions than the poorest 20% of the sample. **Conclusion:** The implications of the shift in health conditions will create a health disparity between 75+ year adults and the rest of the population.

**Keywords:** Old-old, oldest-old, health conditions, chronic diseases, epidemiology, public health, health status, Jamaica

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## Introduction

The elderly population (ages 60+ years) constituted 10.9% of Jamaica's population, which means that this age cohort is vital in public health planning [1]. Eldemire [2] opined that "The majority of Jamaican older persons are physically and mentally well and living in family units". This view was substantiated in an early study; when Eldemire [3] found that approximately 81 percent of the seniors reported that they were physically competent to care for themselves, without any form of external

intervention. Eldemire's work revealed that 88.5 percent being physiologically independent.

Many elderly persons are more than physically independent as Eldemire [3] found 65.5 percent of them supported themselves, with males reporting a higher self-support (82.6%) compared to females, 47.7%. A study conducted by Franzini and colleague [4] found that social support was directly related to self-reported health, which is collaborated by Okabayashi et al's study [5]. The aforementioned situation can explain why many

elderly are offered socio-economic support. Eldemire [3] found that approximately 71 percent of children were willing to accept responsibility for their parents, with seniors who were older than 75 years being likely to need support. Seniors ages 75-84 years are referred to as old-old and those 85+ are referred to as oldest-old.

The 2001 Population Census of Jamaica found approximately 66 percent of the elderly live in private households [6], which imply that the aged are physically and mentally competent. This is in keeping with Eldemire's studies [2, 3]. The functional independence of the elderly is not atypical to Jamaica as DaVanzo and Chan [7], using data from the Second Malaysian Family Life Survey which includes 1,357 respondents of age 50 years and older living in private households, noted that some benefits of co-residence range from emotional support, companionship, physical and financial assistance [8]. Embedded in DaVanzo and colleague's work is the issue of 'Is it functional independence or stubbornness?' that accounts for the elderly persons' report that they are physically and mentally well in order that family and onlookers will not request that they live in home care facilities. This brings into focus the issues of health status and health conditions of elderly Jamaicans.

Physical disability and health problems increase with age [9]. Bogue [9] opined that demand for medical care increases with ageing and that this is owing to health deteriorations. He [9] also noted that as an individual age, the demands on their children increases and likewise their demand on the public services also increases. Statistics revealed that 15.5% of Jamaicans reported suffering from an illness/injury in 2007; this was 2.8 times more for individuals ages 65+ and 2.4 times for those people ages 60+ years [10]. This further goes to concurs with Bogue's perspective that ageing is associated with increased illness. Concurrently, in 2007, 51.9% of Jamaicans who reported an illness, in the 4-week period of the survey, indicated that this was recurring compared to 75.1% of the elderly. The elderly also sought more medical care (72%) compared to the general population (66%), purchased more medication (78.3% compared to the general population, 73.3%) and had more health insurance coverage (27.8%) compared to the general population (21.1%) [10]. The aforementioned findings only concur with the work of Bogue, and still does not provide us with changing in health conditions of the elderly in particular the old-old-to-oldest old.

Using a sub-sample of 3,009 elderly Jamaicans, Bourne [11] found that the general wellbeing was low; but, within the context of Bogue's work, raised the question of the old-old or the oldest-old's health status. Bourne [12], using a sub-sample of 1,069 respondents ages 75+ years, found that 51.3% of those 75-84 years had poor health status compared to 52.6% of the oldest-old. There was no significant statistical difference between the poor health status of old-old and oldest-old Jamaicans. While poor health status comprised of health conditions, Bourne's works do not provide us with an understanding of the

health conditions over time and whether these are changing or not. A study on elderly Barbadians by Hambleton and colleagues [13] found that current health conditions (diseases) were the most influential predictor of current health status and adds value to discourse that health conditions provide some understanding of health status. However, this finding does not clarify the epidemiological transition of health conditions affecting the old-old-to-oldest-old Caribbean nationals, in particular Jamaicans.

An extensive review of health and ageing literature in the Caribbean revealed no study that has examined an epidemiological transition of health conditions of people 75+ years. In Jamaica, 4% of the population in 2007 were older than 75+ years, indicating that over 100,000 Jamaicans have reached 75 years or older. This is a critical group that must be studied for public health planning as more elderly have chronic dysfunctions than any other age cohort in the population. The aims of the current study are 1) provide an epidemiological profile of health conditions affecting Jamaicans 75+ years, 2) examine whether there is an epidemiological transition in health conditions affecting old-old-to-oldest-old Jamaicans, 3) evaluate particular demographic characteristic and health conditions of this cohort, 4) assess whether current self-reported illness is strongly correlated with current health status, 5) mean age of those with particular health conditions, 6) model health status and 7) provide valuable information upon which health practitioners and public health specialists can make more informed decisions.

## Materials and Methods

The current study utilized a sub-sample of approximately 4% from each nationally cross-sectional survey that was conducted in 2002 and 2007. The sub-sample was 282 people ages 75+ years from the 2007 cross-sectional survey (6,783 respondents) and 1,069 people ages 75+ years from the 2002 survey (25,018 respondents). The survey is known as the Jamaica Survey of Living Conditions which began in 1989.

The survey was drawn using stratified random sampling. This design was a two-stage stratified random sampling design where there was a Primary Sampling Unit (PSU) and a selection of dwellings from the primary units. The PSU is an Enumeration District (ED), which constitutes a minimum of 100 residences in rural areas and 150 in urban areas. An ED is an independent geographic unit that shares a common boundary. This means that the country was grouped into strata of equal size based on dwellings (EDs). Based on the PSUs, a listing of all the dwellings was made, and this became the sampling frame from which a Master Sample of dwelling was compiled, which in turn provided the sampling frame for the labor force. One third of the Labor Force Survey (i.e. LFS) was selected for the JSLC [14, 15]. The sample was weighted to reflect the population of the nation.

The JSLC 2007 [14] was conducted May and August of that year; while the JSLC 2002 was administered between

July and October of that year. The researchers chose this survey based on the fact that it is the latest survey on the national population and that it has data on self-reported health status of Jamaicans. A self-administered questionnaire was used to collect the data, which were stored and analyzed using SPSS for Windows 16.0 (SPSS Inc; Chicago, IL, USA). The questionnaire was modeled from the World Bank's Living Standards Measurement Study (LSMS) household survey. There are some modifications to the LSMS, as JSLC is more focused on policy impacts. The questionnaire covered areas such as socio-demographic variables – such as education; daily expenses (for past 7-day; food and other consumption expenditure; inventory of durable goods; health variables; crime and victimization; social safety net and anthropometry. The non-response rate for the survey for 2007 was 26.2% and 27.7%. The non-response includes refusals and rejected cases in data cleaning.

### Measures

**Age:** The length of time that one has existed; a time in life that is based on the number of years lived; duration of life. Or it is the total number of years which have elapsed since birth [16].

**Elderly (or aged, or seniors):** The United Nations defined this as people ages 60 years and older [17].

**Old-Old.** An individual who is 75 to 84 years old [9]

**Oldest-Old.** A person who is older than 85 years [9].

**Health conditions (i.e. self-reported illness or self-reported dysfunction):** The question was asked: "Is this a diagnosed recurring illness?" The answering options are: Yes, Cold; Yes, Diarrhoea; Yes, Asthma; Yes, Diabetes; Yes, Hypertension; Yes, Arthritis; Yes, Other; and No.

**Self-rated health status:** "How is your health in general?" The options were very good; good; fair; poor and very poor.

**Good health status** is a dummy variable, where 1=good to very good health status, 0 = otherwise

**Income Quintile** can be used to operationalize social class. **Social class:** 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).

**Health care-seeking behavior.** This is a dichotomous variable which came from the question "Has a doctor, nurse, pharmacist, midwife, healer or any other health practitioner been visited?" with the option (yes or no).

### Statistical Analysis

Descriptive statistics, such as mean, standard deviation ( $\pm$  SD), frequency and percentage were used to analyze the

socio-demographic characteristics of the sample. Chi-square was used to examine the association between non-metric variables, and Analysis of Variance (ANOVA) was used to test the relationships between metric and non-dichotomous categorical variables whereas independent sample t-test was used to examine a statistical correlation between a metric variable and a dichotomous categorical variable. The level of significance used in this research was 5% (i.e. 95% confidence interval).

## Results

### *Sociodemographic characteristics of sample*

Of the sample for 2002, 57.6% was female compared to 57.4% females in 2007. The mean age in 2002 was 81.3 years (SD = 5.6 years), and this was 81.4 years (SD = 5.4 years) in 2007. More than two-thirds of the 2002 sample dwelled in rural areas, 20.8%. In 2007, the percent of sample who resided in urban areas increased by 169.7%, and a reduction by 25.9% of those who dwelled in rural zones compared to a marginal reduction of 4.3% in semi-urban areas (Table 1). Concurrently, in 2007, 51.6% of sample reported suffering from an illness which was a 22% increase over 2002. Five percent more people sought medical care in 2007 over 2002 (i.e. 69.2%).

### *Illness (or health conditions)*

A number of shifts in diagnosed health conditions were observed in this study. The number of cases of hypertension and arthritis were observed between the two periods. The most significant increase in health conditions was in diabetes mellitus cases (i.e. 576%) (Fig. 1).

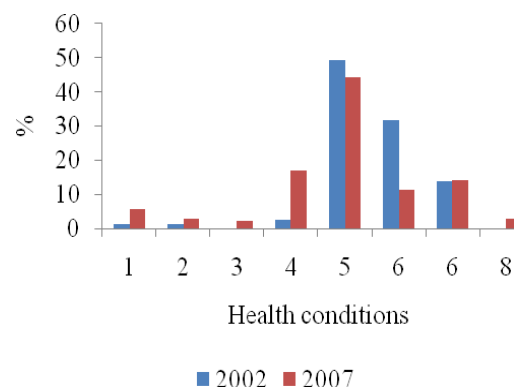


Fig. 1 Diagnosed health conditions, 2002 and 2007

Figure 1 expresses the percentage of people who reported being diagnosed with particular health conditions in 2002 and 2007. Each number denotes a different health condition: cold, 1; diarrhea, 2; asthma, 3; diabetes mellitus, 4; hypertension, 5; arthritis, 6; other (unspecified), 7; and non-diagnosed illness, 8.

Table 1 Socio-demographic characteristics of sample

Variable	2002		2007	
	Frequency	%	Frequency	%
<b>Sex</b>				
Male	453	42.4	120	42.6
Female	616	57.6	162	57.4
<b>Marital status</b>				
Married	304	29.2	88	32.4
Never married	255	24.5	66	24.3
Divorced	18	1.7	6	2.2
Separated	22	2.1	7	2.6
Widowed	442	42.5	105	38.6
<b>Income Quintile</b>				
Poorest 20%	239	22.4	56	19.9
Poor	216	20.2	51	18.1
Middle	195	18.2	74	26.2
Wealthy	194	18.1	58	20.6
Wealthiest 20%	225	21.0	43	15.2
<b>Self-reported illness</b>				
Yes	441	42.3	141	51.6
No	601	57.7	132	48.4
<b>Health care-seeking behavior</b>				
Yes	306	69.2	102	72.9
No	136	30.8	38	27.1
<b>Area of residence</b>				
Rural	731	68.4	83	50.7
Semi-urban	222	20.8	56	19.9
Urban	116	10.9	143	29.4
<b>Educational level</b>				
Primary or below	662	66.5		
Secondary	309	31.1		
Tertiary	24	2.4		
<b>Health insurance coverage</b>				
Yes	48	4.6	26.7	
No	998	99.8	73.3	
<b>Age Mean (SD)</b>	81.29 yrs ( $\pm$ 5.6yrs)		81.37 yrs ( $\pm$ 5.38yrs)	
<b>Public health care expenditure Mean (SD)</b>	Ja \$341.54 ( $\pm$ Ja.\$1165.60)		Ja \$368.89.54 ( $\pm$ Ja.\$1518.66)	
<b>Private health care expenditure Mean (SD)</b>	Ja \$1436.23 ( $\pm$ Ja.\$2060.42)		Ja \$1856.04 ( $\pm$ Ja.\$4347.78)	

A cross tabulation between self-reported illness and sex revealed that there was no significant statistical correlation between the two variables (Table 2). Although no statistical association existed between the self-reported illness and sex, the percent of men who reported an illness in 2007 over 2002 increased by 30.5% compared to 16.4% for females.

Table 2 Self-reported illness by sex of respondents, 2002 and 2007

Self-reported illness	2002 <sup>1</sup>		2007 <sup>2</sup>	
	Male N (%)	Female N (%)	Male N (%)	Female N (%)
Yes	174 (39.3)	267 (44.6)	60 (51.3)	81 (51.9)
No	269 (60.7)	332 (55.4)	57 (48.7)	75 (48.1)
<b>Total</b>	<b>443</b>	<b>599</b>	<b>117</b>	<b>156</b>

1  $\chi^2$  (DF = 1) = 2.927,  $P$  = 0.087; 2  $\chi^2$  (DF = 1) = 0.011,  $P$  = 0.916

Table 3 Self-reported illness by marital status, 2002

Self-reported illness	Marital status*				
	Married N (%)	Unmarried N (%)	Divorced N (%)	Separated N (%)	Widowed N (%)
Yes	140 (46.8)	88 (34.8)	9 (50.0)	10 (45.5)	190 (43.2)
No	159 (53.2)	165 (65.2)	9 (50.0)	12 (54.5)	250 (56.8)
<b>Total</b>	<b>299</b>	<b>253</b>	<b>18</b>	<b>22</b>	<b>440</b>

\*  $\chi^2$  (DF = 4) = 9.027,  $P$  = 0.060

No significant statistical relationship existed between self-reported illness and marital status (Tables 4 & 5). In spite of the aforementioned situation, the divorced sample

reported the greatest percentage of increased in self-reported illness (16.7%) followed to married people (15.7%); separated individuals (11.6%), widowed (5.8%) and those who were never married reported the least increase in self-reported illness (5.2%).

Table 4 Self-reported illness by marital status, 2007

Self-reported illness	Marital status*				
	Married	Unmarried	Divorced	Separated	Widowed
	N (%)	N (%)	N (%)	N (%)	N (%)
Yes	55 (62.5)	26 (40.0)	4 (66.7)	4 (57.1)	51 (49.0)
No	33 (37.5)	39 (60.0)	2 (33.3)	3 (42.9)	53 (51.0)
<b>Total</b>	<b>88</b>	<b>65</b>	<b>6</b>	<b>7</b>	<b>104</b>

\*  $\chi^2$  (DF = 4) = 8.589,  $P=0.072$

No significant statistical correlation existed between self-reported illness and age cohort of respondents –  $P > 0.05$  – (Table 5). Although the aforementioned is true, the percent of old-old who reported illness in 2007 over 2002 increased by 23.6% compared to a 16.6% increased in the oldest-old cohort over the same period.

Table 5 Self-reported illness by Age cohort, 2002 and 2007

Self-reported illness	2002 <sup>1</sup>		2007 <sup>2</sup>	
	Old-Old N (%)	Oldest-Old N (%)	Old-Old N (%)	Oldest-Old N (%)
Yes	333 (42.8)	108 (40.9)	110 (52.9)	31 (47.7)
No	445 (57.2)	156 (59.1)	98 (47.1)	34 (52.3)
<b>Total</b>	<b>778</b>	<b>264</b>	<b>208</b>	<b>65</b>

1  $\chi^2$  (DF = 1) = .289,  $P=0.591$ ; 2  $\chi^2$  (DF = 1) = .535,  $P=0.465$

A cross tabulation between diagnosed self-reported health conditions and age of respondents revealed a significant association between the two variables (Table 6). On examination, in 2002, the lowest mean age was recorded by people who indicated that they had arthritis. However, for 2007, the mean age was the lowest for old-old-to-oldest-old who had reported the common cold. A shift which is evident from the finding is the mean age of those with diabetes mellitus in 2002 (79.5 yrs.  $\pm$  2.5 yrs), which was the second lowest age of person with illness in 2002 to the greatest mean age for people with the same dysfunction in 2007 (90.20 yrs  $\pm$  3.54 yrs) (Table 6).

Table 6 Mean age of oldest-old with particular health conditions

Health conditions	2002 <sup>1</sup>		2007 <sup>2</sup>	
	Mean Age ( $\pm$ SD)		Mean Age ( $\pm$ SD)	
Cold	80.00	-	77.63	( $\pm$ 1.77)
Diarrhea	86.00	-	85.00	( $\pm$ 9.66)
Asthma	0.00	-	81.00	( $\pm$ 5.20)
Diabetes mellitus	79.50	( $\pm$ 2.50)	90.92	( $\pm$ 4.84)
Hypertension	80.13	( $\pm$ 0.84)	81.21	( $\pm$ 4.95)
Arthritis	79.32	( $\pm$ 0.69)	79.13	( $\pm$ 3.54)
Other	81.64	( $\pm$ 1.75)	83.90	( $\pm$ 6.82)
<b>Total</b>	<b>80.14</b>	<b>(<math>\pm</math>4.73)</b>	<b>82.75</b>	<b>(<math>\pm</math>4.50)</b>

F statistic [7,134] = 2.085,  $P = 0.049$

Table 7 Diagnosed Health Conditions by Aged cohort

Diagnosed Health conditions	2002 <sup>1</sup>		2007 <sup>2</sup>	
	Aged cohort		Aged cohort	
	Old-Old %	Oldest-Old %	Old-Old %	Oldest-Old %
Cold	1.5	0.0	7.2	0.0
Diarrhea	0.0	8.3	2.7	3.2
Asthma	0.0	0.0	1.8	3.2
Diabetes mellitus	3.0	0.0	11.1	16.1
Hypertension	47.8	58.3	44.1	45.2
Arthritis	35.8	8.3	12.6	6.5
Other	11.9	25.0	11.7	22.6
No	0.0	0.0	2.7	3.2

1  $\chi^2$  (DF = 1) = 10.028,  $P=0.074$ ; 2  $\chi^2$  (DF = 1) = 5.382  $P=0.613$

Based on Table 7, no significant statistical association was found between diagnosed health conditions and age cohort of the sample –  $P > 0.05$ . In spite of this reality, some interesting findings are embedded in the data across the two years. The findings revealed an exponential increase in diabetes mellitus and the common cold. However, the most significant increase occurred in diabetic cases in the oldest-old. Reductions were recorded in hypertension, arthritis and unspecified categorization.

A cross-tabulation between self-reported illness (in %) and Income Quintile revealed a significant statistical correlation between both variables for 2002 ( $\chi^2$  (DF = 4) = 11.472,  $P = 0.022$ ) and 2007 ( $\chi^2$  (DF = 4) = 10.28,  $P < 0.05$ ). Based on Figure 2, the poor had highest self-reported cases of illness compared to the other social groups. Although this was the case for 2002 and 2007, the wealthy reported more illnesses than the wealthiest 20% of sample. Concurrently, the poorest 20% reported the greatest increase in self-reported illness for 2007 over 2002 (19.4%) with the wealthy segment of the sample reported the least increase (2.7%).

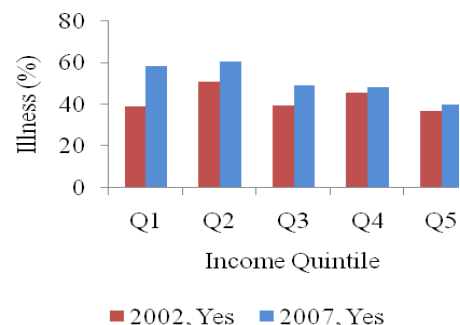


Fig. 2 Self-reported illness (%) by Income Quintile, 2002 and 2007

Figure 2 expresses the percentage of people who reported an illness by income quintiles for 2002 and 2007. Q1 denotes the poorest 20% to the wealthiest 20% (i.e. Q5).

The first time that the Jamaica Survey of Living

Conditions (JSLC) collected information on self-reported illness and general health status (health status) of Jamaicans was in 2007. Based on that fact, this study will not be able to compare the health status of the sample for the two studied years; however, this will be the basis upon which future studies can compare. The cross-tabulation between the two aforementioned variables was a significantly correlated one ( $\chi^2$  (DF = 2) = 39.888,  $P < 0.001$ ) (Table 8).

Table 8 Self-reported illness (in %) by health status.

Self-reported illness	Health Status		
	Good N (%)	Fair N (%)	Poor N (%)
Yes	21 (25.3)	60 (55.0)	60 (74.1)
No	62 (74.7)	49 (45.0)	21 (25.9)
Total	83	109	81

$\chi^2$  (DF = 2) = 39.888,  $P < 0.001$ ,  $cc=0.357$

### Health care-seeking behavior

A cross tabulation of health care seeking behavior and aged cohort revealed no statistical relationship between the two variables for 2002 ( $\chi^2$ (df=1) = 0.004,  $P = 0.947$ ) and for 2007 ( $\chi^2$ (df=1) = 1.308,  $P = 0.253$ ).

Table 9 Health care-seeking behavior and health status, 2007

Health care-seeking behavior	Health Status		
	Good N (%)	Fair N (%)	Poor N (%)
No	9 (42.9)	21(35.6)	8 (13.3)
Yes	12 (57.1)	38 (64.4)	52 (86.7)
Total	21	59	60

$\chi^2$  (DF = 2) = 10.539,  $P = 0.005$ ,  $cc=0.265$

Table 9 revealed that there is a significant statistical relationship between health care-seeking behavior and health status of the sample ( $\chi^2$  (DF = 2) = 10.539,  $P = 0.005$ ,  $cc=0.265$ ). Further examination showed that 57.1% of old-old-to-oldest-old sought medical care, and as health status decreases the percent of sample seeking medical care increases. Of those who reported poor health, 86.7% of them have sought medical care in the 4-week period of the survey. When the aforementioned association was further investigated by aged cohort, the difference was explained by old-old ( $\chi^2$  (DF = 2) = 11.296,  $P = 0.004$ ,  $cc=0.305$ ) and not oldest-old ( $\chi^2$  (DF = 2) = 0.390,  $P = 0.823$ ) (Table 10).

Controlling health care-seeking behavior and health status by aged cohort revealed that the old-old are more likely to seek more medical care with reduction in their good health status; but this is not the case for the oldest-old. With one-half of the cells in oldest-old category being less than 5 items, the non-statistical association possibly is a Type II Error. Type II Error indicates that there is no statistical significant relationship between variables when there is a probability that an association does exist.

Table 10 Health care-seeking behavior by health status controlled for aged cohort.

Aged cohort			Health Status			Total
			Good	Fair	Bad	
Old-old <sup>1</sup>	Health Care-Seeking Behavior	No	7 (46.7)	18 (36.7)	5 (10.9)	30 (27.3)
		Yes	8 (53.3)	31 (63.3)	41 (89.1)	80 (72.7)
	<b>Total</b>		<b>15</b>	<b>49</b>	<b>46</b>	<b>110</b>
Oldest-old <sup>2</sup>	Health Care-Seeking Behavior	No	2 (33.3)	3 (30.0)	3 (21.4)	8 (26.7)
		Yes	4 (66.7)	7 (70.0)	11 (78.6)	22 (73.3)
	<b>Total</b>		<b>6</b>	<b>10</b>	<b>14</b>	<b>30</b>

<sup>1</sup>  $\chi^2$  (DF = 2) = 11.296,  $P = 0.004$ ,  $cc=0.305$ ; <sup>2</sup>  $\chi^2$  (DF = 2) = 0.390,  $P = 0.823$

### Multivariate analysis: Predictors of good health status

Good health status of old-old-to-oldest-old Jamaicans can be predicted by self-reported illness (Table 11). Based on Table 11, self-reported illness is a negative predictor of good health status (OR = 0.176, 95% CI = 0.095 - 0.328). Twenty-four percent of the variability in good health status can be explained by self-reported illness. Concurrently, no other variable except self-reported illness was significantly correlated with good health status. Furthermore, 75.9% of the data were correctly classified: 90.5% of good health status and 42.0% of those who has stated otherwise (poor to fair health status). In addition, an old-old-to-oldest-old Jamaican is 0.824 times less likely to reported good health status.

## Discussion

Ageing is directly correlated with increased functional disability [18]. This can be concurred with the disproportionate number of elderly who continue to outnumber other age cohorts in visits medical care facilities and number of cases in chronic dysfunctions. Statistics from the Planning Institute of Jamaica and Statistical Institute of Jamaica revealed that elderly Jamaicans disproportionately outnumber other ages in diabetes mellitus, hypertension, arthritis and mortality [10, 16, 17]. The Jamaican Ministry of Health data showed that the prevalence of chronic diseases is greatest for those 65+ years. Is the aforementioned information sufficient enough for public health policy makers, health care practitioners and academics as a reference to a comprehensive understanding of the old-old-to-oldest-old in Jamaica? The answer is a resounding no as this study will show.

Bogue [9] showed that functional capacity, demand for medical care and health problems increase with ageing which concurs with Erber's work [18] and other research [19]. The current study found that 10.3% more old-old-to-oldest-old Jamaicans reported at least one health condition in 2007 over 2002 and this was associated with at 1.7% increase health care-seekers.

Table 11 Logistic regression on Good Health status by variables

Variable	Coefficient	Std. Error	Wald statistic	Odds ratio	95.0% C.I.
Self-reported illness	-1.735	0.317	29.950	0.176	0.095 - 0.328***
Age	-0.041	0.030	1.910	0.960	0.905 - 1.017
Middle Class	-0.083	0.414	0.040	0.921	0.409 - 2.072
Upper class †Poor	0.391	0.759	0.264	1.478	0.334 - 6.546
Married	0.297	0.393	0.574	1.346	0.624 - 2.907
Divorced, separated or widowed †Never married	-0.110	0.376	0.086	0.896	0.428 - 1.872
Urban area	0.347	0.350	0.981	1.414	0.712 - 2.808
Other town †Rural area	-0.398	0.414	0.922	0.672	0.298 - 1.513
Constant	2.979	2.456	1.471	19.667	-

$\chi^2 = 40.083$ ,  $p < 0.001$ ; -2 Log likelihood = 283.783; Nagelkerke  $R^2 = 0.222$ ; Overall correct classification = 75.9%; Correct classification of cases of good self-rated health = 90.5%; Correct classification of cases of not good self-reported health = 42.0%; †Reference group; \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$

In 2007, 73 out of every 100 old-old-to-oldest-old Jamaicans sought medical care which is the national figure (66 out of every 100 Jamaicans). The research found that significant statistical association existed between medical care and health status of sample. Interestingly in this study though, is the fact that as the old-old's health status fall to poor 89 out of every 100 of them sought care compared to 53 out of every 100 old-old who had good health. A critical finding of this study is the fact that after an individual reaches 85 years and beyond, there is no difference in seeking health care. Intertwined in this finding is the psychological reluctance of prolonged life at the onset of illness compared to those in the old-old categorization as many of oldest-old believe that they have lived a long time and so they are able to transcend this life.

People's cognitive responses to ordinary and extraordinary situational events in life are associated with different typologies of wellbeing [20]. Positive mood is not limited to active responses by individual, but a study showed that "counting one's blessings," "committing acts of kindness", recognizing and using signature strengths, "remembering oneself at one's best", and "working on personal goals" are all positive influences on wellbeing [21,22]. Happiness is not a mood that does not change with time or situation; hence, happy people can experience negative moods [23]. Within the context of the aforementioned, an individual who has lived or is living for 85+ years consider this as a blessing and so they are comfortable with that blessing, which accounts for the psychological reluctance to prolong life if this is accompanied by severity of illness.

The World Health Organization opined that the among the

challenges of the 21<sup>st</sup> century will how to prevent and postpone dysfunctions and disability in order to maintain the health, independence and mobility for aged population. The current research found that 42 out of every 100 old-old-to-oldest old Jamaican reported an illness in 2002 and this increased to 52 out of every 100. The substantiate matter is not merely the increase in dysfunctions; but it is the epidemiological transition in typology of diseases. Health conditions were not only reported, they were substantially diagnosed by a medical practitioner. An alarming finding was the exponential increase in number of diabetic (576%) and cold cases (330.77%) in 2007 over 2002, indicating the challenge of revamping lifestyle at older ages. It should be noted here that the average age for an old-old-to-oldest-old having diabetes mellitus increased from 79.5 years to 90.0 years, and therefore this reinforces the point that psychological reluctance to live with critical changes that diabetes mellitus may cause.

The challenge for the old-old-to-oldest in Jamaica is not merely the lifestyle changes that follow diabetes mellitus; but the complication from having more than one illnesses and the issues surrounding the diseases. These issues include blindness, renal failure and micro-vascular complications. Forty-four out of every 100 persons in the sample had hypertension in 2007, and the fact that diabetes mellitus and hypertension are strongly related, the old-old-to-oldest-old will be experiencing many health problems. A study by Callender [27] found that 50% of individuals with diabetes had a history of hypertension and given that Morrison [28] opined that these are twin problems for the Caribbean, it is more problematic for the people 75+ years.

Studies have shown that ageing is directly correlated with increased health conditions, this research found that such a reality dissipates after 75+ years. While this study is not able to provide an explanation for this finding, factors such as sex, marital status, poverty and area of residence are no longer contributions to health disparity which contradicts other studies [29-34]. Poverty, which is critical to health determinant [35,36] and the fact that it explains incapacity to afford food, health care and other necessities, may seem improbable as not being a predictor of good health of old-old-to-oldest old Jamaicans. However, it is associated with health conditions for this sample. This means that health status is wider than dysfunction, and how this cohort feels about life is even broader than the challenge of physical incapacity. In spite of this claim, health conditions are a strong predictor of health status for the old-old-to-oldest-old in Jamaica. This concurs with Hambleton and colleagues' work [13] which found that 33.6% of the total explanatory power (38.2%) of health status of elderly Barbadians was accounted for by current health conditions. Embedded in Hambleton et al. [13] and the current study is the critical role that current health conditions play in determining health status.

## Conclusions

This study provides information upon which public health and health practitioners can make more informed decisions about this age group. A fundamental way for this impetus to proceed is the immediate diabetes education in the elderly population in particular those 75+ years. On a panel titled 'Diabetes Education for the Elderly' at the 11<sup>th</sup> Annual international Conference on 'Diabetes and Ageing' conference in 2005 at the Jamaica Conference Centre, Merrins [37] called for diabetes care treatment for elderly which indicates that the issue of diabetes education is not new but that it is even more important today within the context of the current findings.

With over 570% more diabetic cases found in the old-old-to-oldest elderly in Jamaica, this means that on average 96% more cases are diagnosed each year. This is a massive increase in such cases, and cannot go unabated. The increase in diabetes mellitus could be accounted for by the new persons who become 75 years each year or a higher percentage cases that were formerly undetected become diagnosed. Which ever is the case, a public health promotion thrust is required to test all Jamaicans 75+ within the context of a disease prevention agenda and healthy life expectancy. Hence, the implications of the shift in health conditions will create a health disparity between 75+ year adults and the rest of the population. This requires better management of older persons [38], which will also require that people 75+ with good health be tested for diabetes mellitus.

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