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ORIGINAL RESEARCH

Self-reported prevalence of heart attacks and strokes in Jamaica: a cross-sectional study. The Jamaica Health and Lifestyle Survey 2007–2008

This article was published in the following Dove Press journal:
Research Reports in Clinical Cardiology
1 December 2010
Number of times this article has been viewed

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Purpose: Although heart attacks and strokes are among the three leading causes of death in Jamaica, their prevalence among Jamaican adults is not known. This study aims to estimate the prevalence of these conditions and their association with known cardiovascular disease (CVD) risk factors, including age, hypertension, diabetes, overweight/obesity, and hypercholesterolemia.

Participants and methods: A national survey of 2848 Jamaicans aged 15–74 years was performed between 2007 and 2008. An interviewer-administered questionnaire was used to collect data on demographic characteristics, educational achievement, medication history, and social habits, including smoking and alcohol use. Participants were specifically asked whether they had been diagnosed with a heart attack or stroke. Blood pressure, anthropometry, fasting glucose, and total cholesterol were measured by the trained interviewers. Heart attack and stoke prevalence estimates were adjusted for the complex survey design and the age and sex distribution of the Jamaican population.

Results: The estimated prevalence of heart attacks was 0.7% (95% confidence interval [CI] 0.4%–1.2%) (0.9% for men; 0.4% for women) and of strokes was 1.4% (CI 1.0%–1.9%) (1.2% for men; 1.5% for women) with no significant sex differences. The prevalence of reported heart attacks increased with age and was more common in those with hypercholesterolemia. The prevalence of strokes was highest among people aged 55–74 years; those with primary education only; those with hypertension, diabetes, or hypercholesterolemia; former smokers; and former drinkers. In multivariable logistic regression models adjusted for age, sex, and body mass index (BMI), reported heart attacks were higher in men, older participants, and those with secondary education and lower in current drinkers. In similar models, strokes were positively associated with diabetes, hypercholesterolemia, and past alcohol use, after adjusting for age, sex, and BMI.

Conclusion: The overall prevalence of self-reported heart attacks and strokes is low in Jamaica but higher among people with CVD risk factors.

Keywords: heart attack, stroke, Jamaica, cardiovascular disease

Introduction

Cardiovascular disease (CVD) is the leading cause of death worldwide, with almost 17 million deaths reported in 2003.[1] Each year at least 20 million people are estimated to survive heart attacks and strokes and usually require costly follow-up care.[1] CVD is also the leading cause of loss of productive life,[2] particularly in low- and middle-income countries where it is responsible for 10% of disability-adjusted life-years (DALYs) lost.[1,3] Life expectancy in developing countries is rising sharply, resulting in people being exposed to CVD risk factors for longer periods.[4] In addition, CVD often affects

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middle-aged individuals in developing countries, resulting in severe hardships for their families and undermining national development.[4]

Jamaica is a middle-income, developing country with a population of approximately 2.7 million people. The country is currently undergoing an epidemiological transition, with chronic noncommunicable diseases now emerging as the leading causes of morbidity and mortality.[5] For the year 2004, cerebrovascular disease was the leading cause of death in both men and women, with mortality rates of 74.3 per 100,000 and 90.2 per 100,000, respectively.[6] Among men, ischemic heart disease was the fourth leading cause of death, whereas, among women, hypertensive disease ranked third and ischemic heart disease ranked fifth.[6] Mortality rates for ischemic heart disease were 40.2 per 100,000 for men and 33.9 per 100,000 for women.[6] This represents a change from the 1940s when the leading causes of death were primarily infectious diseases.[7]

Apart from mortality statistics, most information on the burden of CVD in the Jamaican population has come from population surveys and hospital activity data collected over 40 years ago, which found a very low prevalence of CVD.[8] Practicing physicians believe that there has been substantial increase in frequency of CVD since that time.

We therefore undertook this study to estimate the prevalence of self-reported heart attacks and strokes in Jamaican adults using data from the Jamaica Health and Lifestyle Survey 2007–2008 (JHLS-2).[9] We also examined the association between heart attack and stroke prevalence in relation to CVD risk factors, including older age, hypertension, diabetes, overweight/obesity, hypercholesterolemia, cigarette smoking, alcohol consumption, and education level (as a marker of socioeconomic status).

Material and methods

Study design and sampling

The JHLS-2 was a cross-sectional study, conducted between November 2007 and February 2008, in a nationally representative sample of 15- to 74-year-old Jamaicans. The study recruited 2848 people using a multistage cluster sampling design. The primary sampling units (PSUs) were enumeration districts (EDs) selected using a probability proportionate to size method. The EDs were selected in consultation with the Statistical Institute of Jamaica (STATIN). Details of the sampling method are published in the project's technical report.[9] Briefly, within each PSU, a random household was selected as the starting point and other households systematically selected at intervals (determined by the number of households in the PSU) to recruit 30 participants within each ED. Within each household, one participant was selected using the Kish random selection method.[10] If the randomly selected household member declined to participate, this was counted as a nonresponse and the next household was visited to recruit a participant. In the event that respondents were unavailable, a minimum of three visits were made before moving on to another household.

The study protocol was reviewed and approved by the Ethics Committees of the Faculty of Medical Sciences of the University of the West Indies, Mona, Kingston, Jamaica, and the Ministry of Health, Jamaica.

Measurements and definitions

Data were collected using questionnaires administered by trained observers in face-to-face interviews, including demographic information, medication history, socioeconomic status (education, occupation, income, and possessions), and social habits (smoking and alcohol use). The self-reported prevalence of heart attacks and strokes was assessed using two questionnaire items: "Have you ever been told by a doctor or other healthcare professional that you have suffered a heart attack?" and "Have you ever been told by a doctor, nurse, or other health professional that you have suffered a stroke?".

Blood pressure (BP) was measured using a mercury sphygmomanometer and followed a standardized protocol.[11] Three measurements were taken at 1-minute intervals using the right arm after the participant had been seated for 5 minutes. The mean of the second and third BP measurements was used in the analysis. BP was categorized as normal, prehypertensive, and hypertensive in accordance with the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).[12] Body weight was measured to the nearest 0.1 kg using a portable digital scale, and height was measured to the nearest 0.1 cm using a portable stadiometer. Body mass index (BMI) was calculated as weight in kilograms divided by the square of height in meters, and participants were categorized as normal (BMI < 25 kg/m^2) or overweight/obese (BMI ≥ 25.0 kg/m^2). Instruments were calibrated weekly. Fasting blood glucose and total cholesterol were measured after a 10-hour overnight fast using capillary blood samples (Accutrend® GCT Roche Diagnostics GmbH). Diabetes was defined according to the World Health Organization (WHO) 2006 criteria[13] as having a fasting glucose level ≥ 7.0 mmol/L or reported use of medication for diabetes. Measured fasting capillary glucose was converted

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to the equivalent fasting plasma glucose using the formula "plasma glucose = 0.102 + 1.066 × capillary glucose" as recommended by the European Association for the Study of Diabetes guidelines.[14] High cholesterol was defined as fasting cholesterol of ≥5.2 mmol/L or being on medication for high cholesterol.[15]

Education was recorded as highest level of education attained and divided into three categories, namely "primary/junior high", "secondary", and "post-secondary". Tobacco smoking was self-reported and classified as "never smoked" (responded no to "Do you currently smoke any form of tobacco?" and "Did you ever smoke any form of tobacco?"), "past smokers" (responded no to "Do you currently smoke any form of tobacco?" and last smoked cigarettes at least one month before survey), and "current smokers" (responded yes to "Do you currently smoke any form of tobacco?"). Alcohol consumption was also self-reported, and participants were classified into one of three categories, "never drinkers", "past drinkers", and "current drinkers", without regard to the quantity of alcohol consumed.

Statistical analysis

Data were analyzed using Stata 10.0.[16] We obtained means and proportions of demographic characteristics and CVD risk factors and covariates by sex. The prevalence of heart attacks and strokes was then obtained with adjustments for complex survey design, nonresponse to questionnaire items, or failure to complete segments of the evaluation. Estimates were also weighted for the age and sex distribution of the Jamaican population. Multivariable logistic regression was used to evaluate the independent associations between prevalent heart attacks and strokes with CVD risk factors.

Results

Descriptive analyses of the study sample and prevalence estimates for CVD risk factors are presented in Tables 1 and 2. These analyses were based on data from 2521 participants (783 men and 1738 women) who had available data for CVD risk factors. The mean age of the participants was 37.4 years. Men had higher mean systolic blood pressure and diastolic blood pressure, and women had higher mean BMI and total cholesterol. There was no significant sex difference in mean fasting glucose. Secondary education was the most frequent level of education for both men and women (47% and 52%, respectively), but a higher proportion of men had the primary/junior high education as their highest level of education.

Overall, there was a high prevalence of CVD risk factors: hypertension 26%, prehypertension 36%, obesity 25%, diabetes 7.9%, hypercholesterolemia 11%, and current smoking 15%. Except for prehypertension and smoking, women had a higher burden of risk factors than men. The prevalence of obesity was approximately three times higher in women than in men, whereas the prevalence of hypercholesterolemia in women was twice that of men. Approximately 65% of the population was consuming alcohol at the time of the survey.

Analyses for heart attacks were based on data from 2021 participants with complete data for self-reported heart attacks and CVD risk factors, whereas analyses for strokes were based on 2001 participants with complete stroke and CVD data. These data are shown in Tables 3 and 4. In order to estimate the possible impact of missing data on our findings we compared mean values for the variables in Table 1 for those included in the analysis and those excluded due to missing values. The overall analyzed sample was, on average, 2 years

Table 1 Summary statistics for characteristics of participants in the Jamaica Health and Lifestyle Survey 2007–2008

	Total N = 2521	Male (M) N = 783	Female (F) N = 1738	*P* value M:F difference
CVD risk factors	**Mean (standard error)**			
Age	37.40 (0.04)	37.4 (0.06)	37.4 (0.05)	0.466
SBP	123.0 (0.53)	124.8 (0.64)	121.2 (0.66)	<0.001
DBP	77.7 (0.41)	78.7 (0.51)	76.4 (0.46)	<0.001
BMI	26.51 (0.19)	24.7 (0.23)	28.4 (0.25)	<0.001
FBG	4.17 (0.05)	4.21 (0.08)	4.13 (0.06)	0.373
Cholesterol	4.37 (0.02)	4.25 (0.02)	4.48 (0.02)	<0.01
Educational levels	**Proportion (standard error)**			
Primary/junior high	0.31 (0.02)	0.34 (0.02)	0.29 (0.02)	0.025
Secondary	0.49 (0.02)	0.47 (0.02)	0.52 (0.02)	0.057
Post-secondary	0.19 (0.02)	0.20 (0.02)	0.19 (0.02)	0.796

Note: Estimates are weighted for complex survey design and the age and sex distribution of the Jamaican population.
Abbreviations: BMI, body mass index; CVD, cardiovascular disease; DBP, diastolic blood pressure; FBG, fasting blood glucose; SBP, systolic blood pressure.

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Table 2 Prevalence of heart attack and stroke risk factors in the Jamaica Health and Lifestyle Survey 2007–2008

Risk factors	Total % (95% CI)	Male (M) % (95% CI)	Female (F) % (95% CI)	*P* value M:F difference
Hypertension	25.7 (23.7–27.8)	25.6 (22.8–28.7)	25.7 (23.6–28.1)	0.940
Prehypertension	35.5 (32.6–38.4)	41.4 (37.3–45.6)	29.8 (27.2–32.6)	<0.001
Diabetes	7.9 (6.8–9.1)	6.6 (4.9–8.7)	9.2 (8.0–10.4)	0.029
High cholesterol	11.3 (9.9–12.9)	7.5 (5.7–9.6)	15.0 (13.2–17.1)	<0.001
Overweight/obese (BMI ≥ 25 kg/m^2)	51.6 (49.0–54.2)	38.0 (34.0–42.2)	64.9 (61.7–67.5)	<0.001
Cigarette smoking (past)	16.7 (14.8–18.7)	23.1 (19.6–26.9)	10.5 (8.3–13.2)	<0.001
Cigarette smoking (current)	15.0 (12.8–17.4)	22.7 (19.5–26.3)	7.5 (5.3–10.6)	<0.001
Alcohol use (past)	4.2 (3.3–5.4)	4.3 (3.1–6.0)	4.1 (3.0–5.6)	0.809
Alcohol use (current)	64.9 (6.8–67.9)	81.2 (76.7–84.9)	49.9 (45.5–52.9)	<0.001

Note: Estimates are weighted for complex survey design and the age and sex distribution of the Jamaican population.
Abbreviations: BMI, body mass index; CI, confidence interval.

older than those with missing data, whereas for the heart attack and stroke analysis mean diastolic BP was 2 mmHg higher than in the analyzed sample compared with those with missing data. Mean fasting glucose was 0.2 mmol/L lower and mean fasting cholesterol 0.1 mmol/L lower in the analyzed sample compared with those with missing data for the heart attack and stroke analysis.

The overall prevalence of self-reported heart attacks was 0.7% (0.9% among men and 0.4% among women [Table 3]). When expressed as the number of people in Jamaica living with a history of heart attack, this translated to approximately 12,000 people: 8000 men and 4000 women. The prevalence of heart attacks was significantly higher among older people, 2.6% among those aged 55–74 years compared with 0.3% among those aged 15–34 years and 35–54 years ($P = 0.001$). Prevalence was also significantly higher among those with hypercholesterolemia: 1.9% compared with 0.5% ($P = 0.018$). Differences in the prevalence of heart attacks in people with diabetes and hypertension and among overweight people were not statistically significant. The prevalence of heart attacks appeared highest among people with only primary or junior high education; however, this was not statistically significant in univariate analysis.

The overall prevalence of strokes was 1.4% (1.2% for men and 1.5% for women). When expressed as numbers, among 15- to 74-year-old Jamaicans, approximately 25,000 have a history of having a stroke: 11,000 men and 14,000 women (Table 4). Age was also significantly associated with stroke prevalence: 0.5% among people aged 15–34 years, 1.3% among those aged 35–54 years, and 4.5% among those aged 55–74 years, $P < 0.001$. In the unadjusted analyses, the prevalence of strokes was significantly higher in people with hypertension (3.9%), diabetes (7.2%), and hypercholesterolemia (5.1%). Stroke prevalence also varied with smoking history, alcohol use, and education level, being highest among past smokers, past drinkers, and people with only primary/junior high education.

Multivariable logistic regression models were used to evaluate the independent associations for self-reported heart attacks and strokes. Models included age, sex, BMI, hypertension, diabetes, high cholesterol, smoking history, alcohol use, and education level. Variables for inclusion in the models were selected based on association with prevalent heart attacks or strokes in the univariate analyses or if the variable was an accepted risk factor for CVD. The adjusted odds ratios are shown in Tables 5 and 6. For prevalent heart attacks, significant associations were found for age and education; odds ratios were 12.59 for age 55–74 years (compared with 15–34 years) and 3.74 for secondary education (compared with primary/junior high education). For strokes, significant associations were found for diabetes mellitus, high cholesterol, and past alcohol use; odds ratios were 3.06 for diabetes, 3.32 for high cholesterol, and 3.67 for past alcohol use.

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Table 3 Prevalence of self-reported heart attacks in the Jamaica Health and Lifestyle Survey 2007–2008, by sex and risk factor

	Total (95% CI)	Men (95% CI)	Women (95% CI)
Overall prevalence			
Percentage	0.65 (0.35–1.21)	0.89 (0.40–1.96)	0.43 (0.17–1.06)
Number of people affected	11,839 (4575–19000)	7886 (1614–14000)	3953 (365–7541)
Age categories (years)[a]			
15–34	0.34 (0.08–1.45)	0.43 (0.06–3.16)	0.25 (0.03–1.81)
35–54	0.29 (0.06–1.28)	0.38 (0.50–2.82)	0.20 (0.03–1.41)
55–74	2.56 (1.20–5.38)	3.58 (1.44–8.61)	1.56 (0.49–4.88)
Education categories			
Primary/junior high	0.98 (0.43–2.26)	1.63 (0.67–3.91)	0.29 (0.07–1.20)
Secondary	0.64 (0.26–1.59)	0.72 (0.17–2.97)	0.57 (0.18–1.82)
Post-secondary	0.12 (0.02–0.92)	–	0.23 (0.03–1.78)
Diabetes mellitus			
No diabetes	0.56 (0.27–1.15)	0.77 (0.31–1.89)	0.36 (0.13–1.01)
Diabetes	1.79 (0.57–5.00)	2.49 (0.67–8.87)	1.14 (0.16–7.55)
Body weight			
Not overweight	0.51 (0.17–1.57)	0.67 (0.18–2.36)	0.26 (0.06–1.06)
Overweight/obese	0.78 (0.39–1.58)	1.26 (0.45–3.43)	0.52 (0.18–1.49)
Blood pressure			
Normal blood pressure	0.57 (0.17–1.86)	0.82 (0.15–4.36)	0.39 (0.08–1.85)
Prehypertension	0.32 (0.07–1.38)	0.39 (0.06–2.64)	0.23 (0.03–1.67
Hypertension	1.22 (0.58–2.57)	1.70 (0.67–4.23)	0.73 (0.23–2.32)
Cholesterol level[a]			
Normal cholesterol	0.49 (0.24–1.01)	0.60 (0.23–1.56)	0.37 (0.13–1.07)
High cholesterol	1.90 (0.69–5.18)	4.39 (1.22–14.58)	0.73 (0.17–3.07)
Smoking status			
Never smoker	0.58 (0.25–1.31)	0.80 (0.22–2.83)	0.44 (0.16–1.20)
Past smoker	1.35 (0.52–3.46)	1.67 (0.57–4.78)	0.68 (0.09–4.84)
Current smoker	0.23 (0.05–0.98)	0.31 (0.07–1.39)	–
Alcohol use			
Never drank alcohol	1.34 (0.61–2.92)	3.44 (1.13–9.94)	0.68 (0.24–1.92)
Past alcohol use	–	–	–
Current alcohol use	0.37 (0.14–0.94)	0.46 (0.15–1.41)	0.23 (0.05–0.99)

Notes: Estimates are weighted for complex survey design and the age and sex distribution of the Jamaican population. [a]$P < 0.05$ for variation within risk factor subcategories for the total group.
Abbreviation: CI, confidence interval.

Table 4 Prevalence of self-reported strokes in the Jamaica Health and Lifestyle Survey 2007–2008, by sex and risk factors

	Total (95% CI)	Men (95% CI)	Women (95% CI)
Overall prevalence			
Percentage	1.37 (1.00–1.88)	1.22 (0.69–2.47)	1.52 (1.03–2.23)
Number of people affected	25,000 (17,000–33,000)	11,000 (4629–17,000)	14,000 (8616–19,000)
Age categories (years)[a]			
15–34	0.45 (0.17–1.21)	–	0.88 (0.33–2.35)
35–54	1.31 (0.68–2.52)	1.87 (0.80–4.31)	0.77 (0.30–1.95)
55–74	4.50 (3.02–6.65)	3.59 (1.62–7.75)	5.40 (3.53–8.17)
Education categories[b]			
Primary/junior high	2.64 (1.68–4.13)	2.21 (0.98–4.93)	3.10 (1.72–5.50)
Secondary	0.49 (0.19–1.23)	0.51 (0.11–2.31)	0.47 (0.16–1.36)
Post-secondary	1.55 (0.60–4.13)	1.26 (0.26–5.74)	1.90 (0.57–6.09)
Diabetes mellitus[a]			
No diabetes	0.87 (0.55–1.37)	0.54 (0.19–1.47)	1.20 (0.67–2.13)
Diabetes	7.19 (4.10–12.32)	10.48 (4.89–21.06)	4.78 (2.09–10.55)
Body weight			
Not overweight	0.66 (0.30–1.44)	0.50 (0.15–1.66)	0.95 (0.34–2.62)
Overweight/obese	2.02 (1.40–2.92)	2.39 (1.21–4.66)	1.82 (1.20–2.75)
Blood pressure[a]			
Normal blood pressure	0.73 (0.26–1.99)	0.51 (0.07–3.63)	0.87 (0.27–2.72)
Prehypertension	0.10 (0.01–0.69)	0.17 (0.02–1.23)	–
Hypertension	3.95 (2.56–6.06)	3.54 (1.77–6.95)	4.38 (2.66–7.11)
Cholesterol level[a]			
Normal cholesterol	0.89 (0.57–1.39)	1.06 (0.57–1.96)	0.71 (0.35–1.43)
High cholesterol	5.05 (3.04–8.27)	3.16 (0.63–14.33)	5.93 (3.57–9.69)
Smoking status[b]			
Never smoker	1.46 (1.02–2.08)	1.19 (0.51–2.72)	1.63 (1.06–2.50)
Past smoker	2.26 (1.20–4.23)	2.50 (1.12–5.46)	1.78 (0.62–4.98)
Current smoker	–	–	
Alcohol use[a]			
Never drank alcohol	1.75 (1.03–2.95)	3.72 (1.60–8.43)	1.13 (0.53–2.40)
Past alcohol use	5.57 (2.50–11.96)	6.88 (2.13–20.08)	4.30 (1.70–10.49)
Current alcohol use	0.89 (0.49–1.58)	0.42 (0.12–1.40)	1.62 (0.93–2.83)

Notes: Estimates are weighted for complex survey design and the age and sex distribution of the Jamaican population. [a]$P < 0.001$ for variation within risk factor subcategories for the total group; [b]$P < 0.05$ for variation within risk factor subcategories for the total group.
Abbreviation: CI, confidence interval.

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Table 5 Odds ratios for cardiovascular disease risk factors and heart attacks in the Jamaica Health and Lifestyle Survey 2007–2008

Risk factor[a]	Odds ratio	95% CI	*P* value
Female sex	0.29	0.07–1.20	0.087
Age 35–54	0.80	0.15–4.43	0.798
Age 55–74	12.59	2.94–53.91	0.001
Secondary education	3.74	1.03–13.66	0.046
Post-secondary education	0.36	0.05–2.83	0.327
Overweight/obese	1.49	0.41–5.41	0.538
Prehypertension	0.34	0.07–1.68	0.182
Hypertension	0.59	0.18–1.93	0.378
Diabetes	1.41	0.40–5.02	0.592
High cholesterol	3.35	0.75–14.99	0.113
Past smoker	1.72	0.43–6.90	0.443
Current smoker	0.29	0.046–1.78	0.177

Notes: Estimates are weighted for complex survey design and the age and sex distribution of the Jamaican population. [a]Reference categories: Sex – Male; Education – Primary/Junior High; Body weight – Not Overweight; Blood Pressure – Normal Blood Pressure; Diabetes – No Diabetes; Cholesterol level – Normal Cholesterol; Smoking – Never Smoked.
Abbreviation: CI, confidence interval.

Discussion

In this study we have estimated that approximately 0.7% of the Jamaican population aged 15–74 years has had a heart attack and 1.4% has had a stroke. This represents approximately 12,000 and 25,000 people, respectively. Both heart attacks and strokes were significantly associated with older age. In multivariable analyses, the prevalence of heart attacks was higher among people whose highest education was at the secondary level, whereas stroke prevalence was significantly higher among people with diabetes, hypercholesterolemia, and past alcohol use.

Table 6 Odds ratios for cardiovascular disease risk factors and strokes in the Jamaica Health and Lifestyle Survey 2007–2008

Risk factor[a]	Odds ratio	95% CI	*P* value
Female sex	0.72	0.27–2.04	0.559
Age 35–54	1.18	0.23–6.07	0.837
Age 55–74	1.94	0.37–10.25	0.432
Secondary education	0.45	0.12–1.67	0.227
Post-secondary education	1.67	0.41–6.89	0.472
Overweight/obese	1.53	0.60–3.89	0.366
Prehypertension	0.10	0.01–0.88	0.038
Hypertension	2.01	0.36–11.23	0.421
Diabetes	3.06	1.28–7.28	0.012
High cholesterol	3.32	1.46–7.55	0.005
Past/current smoke	0.69	0.36–1.33	0.262
Past alcohol use	3.67	1.16–11.60	0.027
Current alcohol use	0.89	0.28–2.84	0.846

Notes: Estimates are weighted for complex survey design and the age and sex distribution of the Jamaican population. [a]Reference categories: Sex – Male; Education – Primary/Junior High; Body Weight – Not Overweight; Blood Pressure – Normal Blood Pressure; Diabetes – No Diabetes; Cholesterol Level – Normal Cholesterol; Smoking – Never Smoked; Alcohol Use – Never Drank Alcohol.
Abbreviation: CI, confidence interval.

The estimated prevalence of heart attacks and strokes in Jamaica is much lower than that reported in the United States for both Black and White Americans. In 2005, data from the Behavioral Risk Factor Surveillance System (BRFSS) survey estimated that 4.0% of Americans reported a history of myocardial infarction;[17] a similar prevalence of 4.2% was reported for 2008.[18] Data from the National Health and Nutrition Examination Survey (NHANES) 2003–2006 reported a prevalence of 3.6% for heart attacks among people aged 20 years and older, 4.7% among men, and 2.6% among women. Prevalence was lower in Blacks: 3.6% among men and 2.9% among women.[18] The British Heart Foundation reported that an estimated 4.1% of men and 1.7% of women aged 16 years and older in England have had a heart attack.[19] Similarly, the prevalence of strokes in Jamaica was lower than in the United States and England. Data from NHANES 2003–2006 revealed a stroke prevalence of 2.9% among people aged 20 years and older, whereas the 2005 Behavioral Risk Factor Surveillance System (BRFSS) revealed an estimated prevalence of 2.7% among men and 2.5% among women.[18] In 2008, the overall prevalence from the BRFSS was 2.6%, with a higher prevalence in Blacks: 3.6% compared with 2.7% in Whites.[18] In England, the estimated stroke prevalence among people aged 16 years and older for the years 2003 and 2006 was 2% for both men and women.[20]

A number of factors may contribute to the lower prevalence of reported strokes and heart attacks in Jamaica compared with the United States and England. Firstly, the data have not been standardized, so some of the differences may relate to the different age structures of the populations. Both the United States and England have older populations and included older people in their surveys. However, when the age-specific estimates are examined, the rates still appear to be higher in the developed countries. These comparisons are somewhat limited, however, because the age-specific groups were not identical. Secondly, estimates of prevalent disease are affected by survival of incident cases; it is therefore possible that the lower prevalence in Jamaica may represent a higher case fatality rate. This possibility is supported by data from Barbados, which showed that stroke survival was lower in Barbadians compared with Blacks living in South London, although Barbadians had a lower stroke incidence rate.[21,22] If the situation in Jamaica mirrors that in Barbados, then the most likely reason for the lower prevalence in Jamaica may be related to a combination of lower incidence and poorer survival compared with the developed countries. Another possible explanation is a likely higher burden of CVD risk factors in the developed countries.

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For example, the prevalence of obesity, hypertension, and hypercholesterolemia in the United States was reported as 34%, 33%, and 45%, respectively,[23] compared with 25%, 25%, and 12% for those conditions in Jamaica.[9] The prevalence of diabetes was similar in Jamaica and the United States: 7.9% and 7.7%, respectively. In addition, the rates in Jamaica might have been affected by under-reporting or under-diagnosis of CVD events due to failure to recognize the symptoms by patients and failure to confirm the diagnosis by physicians as a result of nonavailability of diagnostic equipment and an inadequate number of CVD specialists.

The associations between CVD risk factors and the prevalence of strokes and heart attacks found in this study are generally consistent with the published literature, although a number of the associations were not statistically significant. However, we cannot draw major conclusions from these nonsignificant associations, as the number of cases of heart attacks and strokes was relatively small. The study was therefore not adequately powered to detect differences by risk factor subgroups; this is particularly so for heart attacks. There was a fairly strong association between prevalent strokes and diabetes, hypercholesterolemia, and past alcohol use. This should strengthen the resolve to target the treatment and control of these conditions in public health strategies in order to reduce CVD morbidity and mortality. The association with hypertension was consistent with the literature, although not statistically significant. The lower point estimate for the odds ratio for strokes among people with prehypertension was an unexpected finding but was not statistically significant. This could be a chance occurrence and would not warrant major inference at this time. It would, however, be interesting to see whether this is seen again in other studies.

The analysis for this study was based on self-reports of disease status, thus introducing the possibility of misclassification due to inaccurate recall by study participants. However, self-report is an established and generally accepted method for evaluating frequency of clearly defined diseases such as heart attacks and strokes and has been used in the prevalence estimates from health surveys in the United States and United Kingdom.[18,19,24] In addition, a number of studies have evaluated the validity of self-reports of heart attacks and strokes and have found fairly high sensitivity and specificity.[25–29] For example, in one study, Okura et al found that self-reported data from questionnaires had sensitivity of 90% for heart attacks and 78% for strokes, and specificity was 98% for heart attacks and 99% for strokes.[27] We therefore believe that the estimates presented for this study are plausible.

The study may also have been limited by missing data for a number of variables. Participants with missing data were excluded from the analysis, resulting in 2521 people being used for analysis of data for CVD risk factors, 2021 for the estimation of heart attack prevalence and associations, and 2001 for the estimation of stroke prevalence and association. The overall analyzed sample was, on average, 2 years older than those with missing data, whereas for the heart attack and stroke analysis, mean diastolic BP was 2 mmHg higher than in the analyzed sample compared with those with missing data. These differences were quite small and are unlikely to have affected the overall results of the study.

This study represents the first published estimates of heart attack and stroke prevalence in Jamaica using a nationally representative sample and will provide data that can be used in planning health service delivery for these conditions in Jamaica. Estimates may also be relevant to other Caribbean countries and countries with similar population characteristics. It also raises questions as to the reasons for the lower prevalence of heart attacks and strokes in Jamaica compared with the United States and United Kingdom and should serve as a catalyst for research in this area. Larger studies are required in order to further explore factors associated with prevalent heart attacks and strokes in Jamaica. Longitudinal studies are also needed to document incident heart attacks and strokes and survival in patients with strokes and heart attacks. These data would help to define culturally relevant strategies to reduce the burden of CVD in Jamaica and the Caribbean.

Conclusion

The self-reported prevalence of heart attacks and strokes is relatively low in Jamaica. However, at a population level, the number of people affected is significant. The burden of disease is higher among people with CVD risk factors.

Acknowledgments

The authors wish to thank the respondents who participated in the survey and the training and field staff who worked to ensure the timely completion of the survey. We also wish to acknowledge the assistance of the Tropical Medicine Research Institute (TMRI), Office of Sponsored Research, and Office of Finance of the University of the West Indies, and to thank other investigators (Ms Ayesha Johnson, Dr Georgiana Gordon-Strachan, Dr Jan van den Broeck, Dr Deanna Ashley,

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Prof Peter Figueroa, and Dr Elizabeth Ward) for their contribution to the project.

Funding

Funding for the project was provided by the National Health Fund, Jamaica.

Disclosure

The authors declare that they have no competing interests.

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