


Cardio-Vascular Disease and Cancer: A Dichotomy in Utilization of Clinical Preventive Services by Older Adults in a Developing Country

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Abstract

Objective: To report the level of utilization of clinical preventive services by older adults in Jamaica and to identify independent factors associated with utilization. **Method:** A nationally representative, community-based survey of 2,943 older adults was undertaken. Utilization frequency for six preventive, cardiovascular or cancer-related services was calculated. Logistic regression models were used to determine the independent factors associated with each service. **Results:** A dichotomy in annual utilization rates exists with cardiovascular services having much higher uptake than those for cancer (83.1% for blood pressure, 76.7% blood glucose, 68.1% cholesterol, 35.1% prostate, 11.3% mammograms, and 9.6% papanicolaou smears). Age, source of routine care, and having a chronic disease were most frequently associated with uptake. **Discussion:** Education of providers and patients on the need for utilizing preventive services in older adults is important. Improved access to services in the public sector may also help increase uptake of services.

Keywords

clinical preventive service utilization, screening, Jamaican older adults, cancer, cardiovascular health

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Background

The aging process is associated with high morbidity, loss of functionality, and premature mortality; this is due in part to preventable and manageable non-communicable diseases (NCDs) that are prevalent in older populations (i.e., those 60 years and above, [United Nations, 2012]). NCDs present with a lengthy, asymptomatic phase that may start as early as in childhood, making them susceptible to interventions aimed at identifying early preclinical changes. Increasingly, NCDs have been recognized as a problem for developing countries where the disease burden is high and the resources available for care, managing complications, and hospitalizations are less (Starfield, Shi, & Mackino, 2005; Strong, Mathers, Leeder, & Beaglehole, 2005). The WHO (2002) supports aggressive action on this front, stating that

Failing to prevent or manage the growth of NCDs appropriately will result in enormous human and social costs that will absorb a disproportionate amount of resources, which could have been used to address the health problems of other . . . groups. (p. 13)

International agencies highlight the low cost, high benefit nature of offering clinical preventive services among high-risk populations such as older adults in low-income settings. Prevention or preventive services are defined by Porta (2008) to be any action aimed at eradicating, eliminating, or minimizing the impact of disease, their complications, and/or disability in persons. There are three traditionally accepted levels of prevention in health, that is, those at the primary, secondary, and tertiary levels. Services such as disease screenings among asymptomatic persons (secondary prevention), and those used to control/manage NCDs and prevent disability (tertiary prevention) are especially recommended for this cohort. Blood pressure, blood glucose, and cholesterol checks are relatively cheap and accessible,

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requiring little additional financial and/or human resources for their widespread delivery in a health setting. As such, they are widely recommended as effective measures for both secondary and tertiary prevention in high-risk populations in low-resource countries. The management of these conditions may help in reducing cardiovascular diseases (CVD) such as peripheral artery disease, stroke, and heart attacks. In addition to cardiovascular benefits, blood glucose checks are also recommended for the early diagnosis and management of diabetes and associated complications such as kidney failure, diabetic retinopathy, and stroke (American Diabetes Association, 2014). Recommendations for other popular preventive services such as cancer screenings (e.g., mammograms to identify breast cancer, papanicolaou [pap] smears for cervical cancer, and digital rectal exams/prostate specific antigen checks (DRE/PSA) for prostate cancer) vary by age, organization, and the risk profile of the target group.

CVD and cancer pose a significant but many times preventable disease burden on individuals, communities, and the economy of countries (Gaziano, 2007). Although primary prevention activities encouraging healthy lifestyles and behaviors are important, the identification of early departures from health and the prevention of complications and disability due to disease are critical clinic-based tools in managing the burden of these conditions. In relation to cancer, it has been estimated that between 3% and 35% of deaths could be avoided through screening and a significant amount of morbidity could also be reduced (National Cancer Institute, 2015)

In spite of international protocols recommending the utilization of clinical preventive services, use is still low in many countries (Brenes-Camacho & Rosero-Bixby, 2009). Factors reported to be associated with uptake include sex, age, education, area of residence, union status, retirement status, health insurance access, having a routine source of care, type of care provider, and chronic disease status (Chen, Diamant, Pourat, & Kagawa-Singer, 2005; Musa, Schulz, Harris, Silverman, & Thomas, 2009; Pagan, Puig, & Soldo, 2007; Soares, Walters, Frankson, Kirlaw, & Reid, 2009; Weaver & Gjesfjeld, 2013). Many of these studies have however examined the situation from a developed country's perspective, making the evidence less transferable to developing and small island developing states such as Jamaica.

Jamaican Context

Uptake of preventive services is important in Jamaica and similar contexts where public spending on health is low (Planning Institute of Jamaica & Ministry of Foreign Affairs and Foreign Trade, 2009) and disease burden and risk are high. The population is aging rapidly (Eldemire-Shearer et al., 2011) and has a high NCD burden (Ferguson et al., 2011), which is expected to continue on a steep upward trajectory.

Cardiovascular health. In this largely Afro-Caribbean population, risk of CVD is significant with hypertension and diabetes prevalence among older adults being 61.4% and 26.2% respectively (Mitchell-Fearon et al., 2014). Hypercholesterolemia is also high in the population, with Tulloch-Reid et al. (2013) reporting this condition in 25% of women and 11% of men in the 40 to 74 years age group, whereas Eldemire-Shearer, James, Waldron, and Mitchell-Fearon (2013) reported abnormal total cholesterol levels in 51.6% of Jamaicans 60 years and older. Ever smoking and obesity prevalence are also high among older adults at 48% and 25.4%, respectively (Eldemire-Shearer et al., 2013; Mitchell-Fearon et al., 2014). Findings from Ferguson et al. (2011) support the assertion that CVD risk factors in Jamaica are very high and warrant urgent intervention.

Cancer. Nationally representative health surveys were conducted among older adults in Jamaica in 1990 and 2012. Eldemire-Shearer et al. (2013) reported that based on a comparison of these survey data, cancer incidence in older Jamaicans increased significantly (by 118%) over the 12-year period. Cancers of the breast, cervix, and prostate are the focus of this article as they represent site-specific cancers of high prevalence, which are amenable to early detection activities. Early identification through cancer screening activities may allow for a reduction in the prevalence of late presenting/poor prognosis cases in this limited resource setting. In terms of prostate cancer, the Caribbean has the highest mortality rate worldwide (Jemal, Bray, & Ferlay, 2011), with this being the most prevalent cancer in Jamaica (Aiken, 2011). Breast cancer also plays a dominant role in Jamaica's health profile, having an age-adjusted incidence rate of 43.1 per 100,000 (Chin, Green, Strachan, & Wharf, 2014). The cervical cancer mortality rate is high (i.e., 11.8/100,000; Lewis-Bell et al., 2013; Ministry of Health [MOH], 2011b), with an approximated 35% of women having at least 1 oncogenic Human Papilloma Virus (HPV) type (Lewis-Bell et al., 2013); this makes the cervical cancer burden greater than many Caribbean and non-Caribbean countries (Andall-Brereton et al., 2011; Bruni et al., 2010).

Being built on a foundation of primary health care (PHC) with no user fees, the Jamaican health system is amenable to offering cardiovascular and cancer-related preventive services to the general population with minimum out-of-pocket costs. Based on this and the high-risk health profile of the population, Jamaica's MOH stresses the need for secondary and tertiary preventive measures in primary care settings. This includes recommendations for blood pressure and cholesterol checks, mammograms and prostate exams annually for older adults, and screenings for diabetes every 1 to 5 years. Screenings for cervical cancer are recommended every 1 to 3 years for women 25 years and above (MOH, 2011a).

Table 1. Population and Sample Distribution by Parish.

Parish	Population (n, %)	No of EDs selected by parish (n, %)	ED characteristics	ED samples as % of national pop. (= ED % × 0.47)	Parish population as % of national pop. (26,97,983)
Kingston	89,057 (7)	2 (6)	Urban, inner-city	2.7	3.3
St. Andrew	573,369 (45)	16 (46)	Largely urban	21.5	21.3
St. Thomas	93,902 (7)	3 (7)	Rural	3.5	3.5
St. Catherine	516,218 (41)	14 (40)	Mix of rural, urban, semi-urban	18.8	19.1
Total	1,272,546 (100)	35 (100)	N/A	47.0	47.2

Note. ED = enumeration districts.

To reap the financial and human resource benefits of preventive services among older adults, a better understanding of their utilization practices must be available to inform evidence-based policies. This study represents the first effort to assess the utilization of secondary and tertiary preventive services among the high-risk older population in Jamaica. The article aims to (a) quantify the uptake of clinical preventive services among older Jamaicans and (b) to determine the effect of independently associated putative risk factors for utilization of these services. Such evidence will add to the limited body of knowledge in Jamaica and similar countries and may serve to inform interventions aimed at improving uptake in resource-limited settings.

Method

Background and Sampling Method

The data informing this article were taken from a nationally representative survey of 2,943 older adults living in Jamaica in 2012. The study aimed to determine the health, health-seeking behaviors, and socio-economic status of older adults. Non-institutionalized, community-dwelling persons 60 years and older were considered to be eligible for study entry. Older adults were defined as 60 years and older in accordance with the United Nations (2013).

The sampling frame consisted of 4 of Jamaica's 14 parishes (i.e., 47% of the island's population) and used a "probability proportional to size," two-stage cluster sampling strategy to select study participants. Parish enumeration districts and households were used as the first and second clusters of this sampling strategy. Older adults incapable of answering the questionnaire on their own (e.g., those with cognitive impairment) were included in the study through use of information provided by a responsible household member who was intimately aware of issues related to the respondent. The sample is nationally representative; Table 1 shows the sample's distribution by parish and enumeration district and compares this sample with the national population (Statistical Institute of Jamaica, 2011). Additional methodological details of this study have been described elsewhere by Mitchell-Fearon et al. (2014).

Data Collection

The data collection tool was a structured, pre-coded questionnaire of 197 questions developed by researchers for this survey. The survey was developed by local experts in the field of geriatrics and gerontology, thus pointing to high levels of face and consensual validity for this setting. The questionnaire was also pre-tested in the target audience before initiating the study. Data collectors were trained for a week on variable definitions, and the standardized use of this instrument and interviews occurred on a face to face basis. On entering each enumeration district, randomly selected coordinates were used to indicate the household that would be the starting point of the survey. If the participant was unable to complete the survey due to health reasons, then a knowledgeable household member was interviewed on his or her behalf. The survey response rate was approximately 95%.

Study Variables

The preventive services assessed for this article were those related to cardiovascular health (i.e., blood pressure, blood glucose, and cholesterol checks) and cancer (mammography, pap smears, and prostate exams [DRE/PSA]). These services were included in this study because of the high financial and social burden of the conditions they identify/help to manage in Jamaica and the wider Caribbean region, and due to data availability from the data set being used. Utilization of these services was measured by the question, "Have you had [this test] in the past 12 months?" A 12-month periodicity was used for two major reasons: The first is to reduce recall bias in this older population, and the second was to be in line with Jamaica's MOH recommendations.

Independent variables were identified and included in this article based on a literature review of putative factors for the uptake of preventive services and on the availability of variables in the study data set. Socio-demographic and health variables included in the analysis were sex, age, education, area of residence, union status, retirement status, health insurance access, having a routine source of care, type of care provider, and chronic disease status. Type of care provider was categorized as being either

public or private; public providers were defined as government employees who do not charge consultation/service fees, whereas private providers are those who operate in the free market as entrepreneurs on a fee-for-service basis.

Age was reported in three categories (60-69 years, 70-79 years, and 80 years and above), whereas area of residence was categorized as being either rural or urban. Union status classified persons as being "in union" if they were married or in a common-law relationship, and "not in union" if they were single, divorced, separated, widowed, or in any other relationship. "Having a routine source of care" (yes/no) and "type of routine care provider" (public only, private only, both) were measured using the following questions: "Do you have a particular public doctor or clinic that you would call your regular health provider?" and "Do you have a particular private doctor or clinic that you would call your regular health provider?" Chronic disease status was assessed by doctor-diagnosed self-reports and was measured by the question, "Have you ever been told by your doctor that you have the condition . . . ?" The NCDs included in this study were hypertension, diabetes, coronary heart disease, and cancer (at any site). These NCDs are of high impact in older populations and are directly associated with the preventive services being assessed. Doctor-diagnosed self-reports of dyslipidemia were not collected by the data collection tool and so were not included in analysis.

Data Analysis

STATA Version 11 (StataCorp, College Station, TX) was used for analysis. Descriptive statistics (frequencies and proportions) were used to describe the socio-demographics, health, and service utilization pattern of the study population. The proportion of respondents utilizing each of the six preventive services was also reported; where relevant, gender-specific proportions were reported instead of that of the total study population, that is, mammograms, pap smears, and prostate cancers. Due to data availability, blood pressure and blood glucose checks were also reported by the subgroups of those having the condition and those without the condition.

Multivariate, logistic regression models were used to assess the effect (odds ratios [OR] and 95% confidence intervals) of the independent variables on the utilization of individual preventive services. "Having a routine source of care" was not included in the models as it was determined to be highly collinear with the variable "type of health care provider." The Hosmer-Lemeshow goodness-of-fit test was used to assess the fit of all models, and *p* values greater than .05 were determined as being indicative of good model fit.

Results

The study consisted of 2,943 non-institutionalized, community-dwelling older adults; 52% were women, and

Table 2. Socio-Demographic and Health Profile of Respondents.

Variable	Frequency (% , n)
Sex (n = 2,943)	
Male	48.0 (1,412)
Female	52.0 (1,531)
Age groups (n = 2,919)	
60-69	44.2 (1,291)
70-79	33.8 (986)
≥80	22.0 (642)
Highest education (n = 2,920)	
None	5.7 (166)
Primary	72.0 (2,102)
Secondary	12.4 (362)
Post secondary	9.9 (290)
Residence (n = 2,912)	
Rural	25.7 (748)
Urban	74.3 (2,164)
Union status (n = 2,928)	
In union	37.2 (1,088)
No union	62.8 (1,840)
Retirement status (n = 2,898)	
Retired	75.9 (2,198)
Not retired	24.2 (700)
Health insurance (n = 2,943)	
Yes	22.6 (664)
No	77.4 (2,279)
Seen health professional <12 months (n = 2,903)	
Yes	83.9 (2,436)
No	16.1 (467)
Routine source of care (n = 2,803)	
Yes	93.0 (2,606)
No	7.0 (197)
Type of regular provider (n = 2,606)	
Private only	46.2 (1,203)
Public only	40.7 (1,060)
Public and private	13.2 (343)
Presence of chronic conditions	
Hypertension (n = 2,934)	61.4 (1,800)
Diabetes (n = 2,925)	26.2 (767)
CHD (n = 2,913)	5.5 (159)
Cancer (n = 2,906)	5.0 (146)

Note. Conditions are doctor-diagnosed self-reports.
CHD = coronary heart disease.

the plurality of the respondents was in the 60 to 69 age group (44.2%; Table 2). Most respondents lived in an urban setting (74.3%) and had a primary school education or less (77.7%). Most were retired (75.9%) with no health insurance (77.4%).

The cohort had 93.0% of respondents reporting a routine source of care, with 46.2% of these indicating care was provided by only a private source and 40.7% by only a public source (Table 2). Approximately 84% of the population had seen their health professional within the last 12 months. Hypertension and diabetes were prevalent in this cohort, representing 61.4% and 26.2%, respectively.

Table 3. Utilization of Preventive Services Within the Last 12 Months.

Preventive services	Proportion utilizing services (% , n)
Blood pressure screen (<i>n</i> = 2,900)	
Hypertensive	93.4 (1,673)
Not hypertensive	66.4 (736)
Total	83.1 (2,409)
Blood glucose screen (<i>n</i> = 2,866)	
Diabetics	95.7 (727)
Non-diabetics	69.8 (1,470)
Total	76.7 (2,197)
Cholesterol screen (<i>n</i> = 2,877)	68.1 (1,960)
Mammography (women; <i>n</i> = 1,361)	11.3 (154)
Pap smear (women; <i>n</i> = 1,348)	9.6 (129)
Prostate screening (men; <i>n</i> = 1,309)	35.1 (460)

Utilization of Preventive Services

Generally, utilization of preventive services varied greatly in this cohort, ranging from as high as 83.1% for hypertensive screens to as low as 9.6% for pap smears (Table 3).

Cardiovascular disease. Blood pressure checks were widely utilized in this population, with uptake being especially high among persons with self-reported hypertension (93.4%); uptake was 41% higher for adults with high blood pressure than for those with normal blood pressures (Table 3). Blood sugar checks were reported by more than three quarters (76.7%) of the population; the majority of self-reported diabetics reported being screened (95.7%), whereas only 69.8% of non-diabetics reported the same. Among the cardiovascular checks, cholesterol had the lowest uptake at 68.2%.

Cancer. Among cancer screens, prostate exams had the highest uptake in this population; 35.1% of men reported utilization in the last year. Mammograms and pap smears had much lower uptake at 11.3% and 9.6%, respectively (Table 3).

Independent Associations

All covariates included in the regression models were significantly associated with at least one preventive service (Table 4). The most frequent associations were found with age, source of routine care (whether public, private or both), and presence of an NCD. The covariates least frequently associated with use of preventive services were education, area of residence, and retirement status. The Hosmer–Lemeshow goodness-of-fit test reported good fit for all models, with *p* values >05 (Table 4 shows model-specific values).

Accessing care *both* privately and publicly and having hypertension, diabetes, and coronary heart disease significantly increased uptake of hypertensive and diabetic

screenings. Compared with those who only saw a public provider, persons who routinely accessed care in *both* public and private settings were 3.15 and 2.27 times more likely to have a blood pressure and blood glucose screen, respectively (Table 4). Significant, but more moderate associations were also found with being female, 80 years and older, and having health insurance.

As with the other cardiovascular screens, blood cholesterol checks were significantly associated with accessing care in both public and private settings (adjusted OR [aOR] = 1.84) and with having an NCD, that is, hypertension (aOR = 2.25), diabetes (aOR = 1.61), and coronary heart disease (aOR = 2.05; Table 4). Interestingly, cholesterol was the only cardiovascular screen that had a significant association with area of residence, being more likely in urban settings (aOR = 1.48). No associations were found with sex, age, or having health insurance.

For people undertaking cancer screens, age and having an NCD were significantly associated with all three screens. Persons in the 70 to 79 age group were 49% more likely to undertake prostate screens when compared with the 60 to 69 group; uptake was however similar for the 60- to 69-year-olds and the 80 years and above group (Table 4). Prostate screens were the only preventive service to have a comparatively high uptake among those accessing only private care (aOR = 1.48). Utilization was even higher for those who accessed care in both settings (aOR = 1.63). Like mammograms, prostate checks were significantly associated with a history of cancer (OR = 4.65), and like pap smears, the only associated NCD was hypertension (aOR = 1.43; Table 4).

Utilization of cervical cancer screens (i.e., pap smears) reduced significantly with age; 70- to 79-year-olds were 44% less likely to use the service, whereas those 80 years and older were 70% less likely to do so (Table 4). Hypertension was the only NCD to be significantly associated with pap smear uptake (aOR = 1.74). There was no significant association with type of care provider or with cancer diagnosis.

Utilization of mammography services, like that for pap smears, significantly decreased with age; the 70 to 79 and the 80 and above age groups were 37% and 57% less likely to utilize this service than the 60- to 69-year-old group (Table 4). Uptake was also significantly associated with women in a union (aOR = 1.73), women accessing both private and public care (aOR = 2.27), and women who had ever had cancer (aOR = 3.69).

Discussion

Maciosek et al. (2006) indicate that proven, clinical preventive measures are in many instances cheaper to offer to patients, than providing treatment; their use may in fact avert the loss of 20 million life years in the United States annually (Maciosek et al., 2010). Although the cost-effectiveness of any preventive intervention must be measured on its own, those that are offered in high-burden populations are more

Table 4. Adjusted Odds Ratios for Utilization of Preventive Services.

Variables	Adjusted OR (95% CI) for utilization of preventive services						
	Blood pressure	Glucose	Cholesterol	Mammogram (women only)	Pap smear (women only)	Prostate (men only)	
Sex							
Male	1.00	1.00	1.00	—	—	—	—
Female	1.58 [1.20, 2.07]*	1.36 [1.08, 1.72]**	1.09 [0.89, 1.33]	—	—	—	—
Age groups							
60-69	1.00	1.00	1.00	1.00	1.00	1.00	1.00
70-79	1.03 [0.76, 1.38]	1.21 [0.93, 1.56]	1.16 [0.93, 1.44]	0.63 [0.40, 0.99]*	0.56 [0.36, 0.89]*	1.49 [1.10, 2.02]*	
≥80	1.56 [1.09, 2.23]*	1.44 [1.06, 1.95]*	1.21 [0.93, 1.43]	0.43 [0.24, 0.79]**	0.30 [0.15, 0.59]**	1.28 [0.89, 1.85]	
Education							
None	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Primary	0.60 [0.33, 1.07]	0.68 [0.42, 1.12]	0.84 [0.56, 1.28]	0.61 [0.23, 1.65]	0.83 [0.28, 2.42]	1.12 [0.66, 1.90]	
Secondary	0.71 [0.37, 1.40]	0.86 [0.48, 1.52]	0.91 [0.56, 1.48]	0.78 [0.26, 2.34]	0.77 [0.28, 2.42]	1.40 [0.76, 2.60]	
Post secondary	1.2 [0.57, 2.50]	1.01 [0.55, 1.86]	1.15 [0.69, 1.91]	1.39 [0.47, 4.16]	1.77 [0.23, 2.59]	1.42 [0.75, 2.70]	
Residence							
Rural	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Urban	1.05 [0.79, 1.40]	1.08 [0.84, 1.39]	1.48 [1.20, 1.84]**	0.96 [0.58, 1.59]	0.90 [0.55, 1.48]	1.25 [0.93, 1.70]	
Union status							
No union	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In union	1.39 [1.06, 1.82]*	1.05 [0.84, 1.33]	1.11 [0.91, 1.36]	1.73 [1.14, 2.64]**	1.47 [0.96, 2.25]	1.21 [0.93, 1.57]	
Retirement status							
Not retired	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Retired	1.17 [0.87, 1.57]	1.29 [1.00, 1.67]	1.30 [1.03, 1.63]*	0.83 [0.50, 1.40]	1.15 [0.67, 2.00]	1.08 [0.79, 1.49]	
Health insurance							
None	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.76 [1.23, 2.50]*	1.38 [1.03, 1.84]*	1.23 [0.97, 1.57]	1.54 [0.97, 2.42]	1.02 [0.62, 1.69]	1.21 [0.88, 1.65]	
Routine care							
Public only	1	1.00	1.00	1.00	1.00	1.00	1.00
Private only	0.75 [0.57, 0.98]	0.82 [0.65, 1.04]	0.87 [0.71, 1.07]	1.35 [0.84, 2.18]	1.10 [0.69, 1.76]	1.48 [1.10, 1.98]**	
Both	3.15 [1.78, 5.58]*	2.27 [1.49, 3.47]**	1.84 [1.33, 2.56]**	2.27 [1.31, 3.93]**	1.31 [0.73, 2.34]	1.63 [1.07, 2.47]*	
NCDs							
Hypertension	5.35 [4.05, 7.07]*	2.63 [2.11, 3.29]**	2.25 [1.85, 2.73]**	1.44 [0.89, 2.34]	1.74 [1.03, 2.92]*	1.43 [1.09, 1.88]*	
Diabetes	3.08 [2.0, 4.75]*	6.65 [4.36, 10.16]**	1.61 [1.27, 2.03]**	0.81 [0.52, 1.24]	0.81 [0.52, 1.27]	1.25 [0.91, 1.73]	
CHD	4.60 [1.41, 15.0]*	2.42 [1.19, 4.94]*	2.05 [1.24, 3.40]*	1.44 [0.74, 2.82]	1.01 [0.48, 2.15]	0.49 [0.24, 1.00]	
Cancer	1.12 [0.62, 2.03]	1.01 [0.62, 1.66]	1.12 [0.72, 1.74]	3.69 [1.61, 8.47]**	1.46 [0.48, 4.42]	4.65 [2.86, 7.56]**	
Hosmer-Lemeshow (p value)	.85	.15	.23	.54	.77	.35	

Note. Reference groups for NCDs are those not having the condition. All chronic conditions are doctor-diagnosed self-reports. OR = odds ratio; CI = confidence interval; NCD = non-communicable diseases; CHD = coronary heart disease.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

likely to fulfill this criterion. Preventive measures may therefore serve as an important avenue to improve/maintain the health, longevity, and sustained independence of the high-risk, older population (Eldemire-Shearer, Holder-Nevins, Morris, & James, 2009) and all at a reduced cost to the health sector.

Regular contact with health services (and by extension, increased uptake of preventive services) may not only help to control and manage current health issues (tertiary prevention) but also facilitate the detection of new conditions (secondary prevention); as such, this must be the goal of every elder sensitive health system. The study highlights a dichotomy in uptake of services, with cardiovascular screens having fairly high uptake compared with cancer screens. The independent factors found to be most frequently associated with uptake of these services are age, source of routine care, and having an NCD.

The following section discusses the findings of this study as it relates to CVD and then findings related to cancers. For both, the utilization of preventive services are discussed and then an exploration of the relationship between utilization rates and independent variables undertaken. The section is wrapped up by policy implications and the strengths and limitations of this article.

Cardiovascular Disease

Preventive services for cardiovascular health had relatively good uptake in this study and were either similar to or higher than other countries in the Latin America and Caribbean region. Blood pressure check utilization was higher in our setting than in older Mexicans (83% versus 69.7%; Pagan et al., 2007) but was only slightly lower than in older Costa Ricans (89%; Brenes-Camacho & Rosero-Bixby, 2009). Blood sugar check utilization (77%) showed a similar trend; rates were higher than in older Mexicans (59%; Pagan et al., 2007) and fairly similar to that of Costa Ricans (75%; Brenes-Camacho & Rosero-Bixby, 2009). Cholesterol check utilization had the lowest uptake in Jamaica (68%); as with other screens, it is higher than that of older Mexicans (47%; Pagan et al., 2007) but was much lower than the Costa Rican level (79%). The low uptake/reports of cholesterol screens may be due to the relatively low awareness of associated conditions in our population. There are numerous and widespread vernacular expressions for hypertension and diabetes in the Jamaican setting, helping patients of all socio-demographic profiles to be familiar with, and understand the importance of addressing these conditions. This is not true for dyslipidemia, and, as such, patient demand for and memory of screens for this condition may likely be lower than that of other cardiovascular screens. One local study found that 86% of Jamaican adults with hypercholesterolemia were unaware of their risk status (Ferguson et al., 2011).

Blood pressure and glucose screens showed a differential in their uptake as a secondary or as a tertiary preventive

service (this could not be assessed for cholesterol checks due to unavailability of data). Almost all persons with diabetes and with hypertension reported having tertiary prevention screens; for secondary prevention, however, asymptomatic persons showed much lower uptake of services. This differential was also found by Brenes-Camacho and Rosero-Bixby (2009) and may point to widespread awareness of the importance of disease control and management among the chronically ill, but a reduced perception of disease risk and the need for regular screens among "healthy" adults. This is concerning as even asymptomatic older adults in this population are at high risk of developing CVDs; both persons with and without disease must be educated about their risk and encouraged to regularly utilize preventive services. This is especially important in middle-aged and young-old (60-69 years) populations where disease burden is not yet overwhelming and morbidity can be prevented.

In multivariable analysis, sex was found to be independently associated with uptake of blood pressure and blood sugar checks. This is not surprising as positive health-seeking behavior of older Jamaican men has been documented previously (Morris, James, Laws, & Eldemire-Shearer, 2011). Age was also found to be independently associated with both of these checks; persons from 60 to 79 years had similar uptake, but those 80 years and above (i.e., the old-old) reported higher uptake. This may be due to the old-old and their family members having a more acute perception of disease risk, making them more vocal advocates for both preventive checks and checks to control and manage disease. The age trend for service uptake may also be due to a survivor bias in this older group. Persons with good health-seeking behaviors may be more likely to avoid the development of (or have better control of) disease and to live for longer periods, carrying their healthy behaviors into old age. The old-old may also have high uptake of preventive services due to frequent contact with PHC for culture-specific reasons. It is a legal requirement that an autopsy be done if the deceased has not seen a physician recently. Autopsy, however, is culturally unacceptable for many older Jamaicans, and so, frequent PHC visits are made in later years to avoid this requirement. Cholesterol checks were the only CVD screen that did not increase with age; as described before, this may be due to lower awareness and knowledge of dyslipidemia among older Jamaicans as previously discussed.

Type of routine care provider was another factor found to be independently associated with cardiovascular screens. Persons having routine access to both a private and public provider were more likely to utilize services than those who only used one type of provider. This is likely due to the synergy gained from patient interaction with both sectors. In the private sector, all services are available to the patient and in a timely manner but with high out-of-pocket costs. In the public sector, if willing to accept long wait times and irregular availability of some services (based on reagents and supply

availability), health care is provided at no cost to the patient. Persons who are able to successfully navigate both systems are likely to gain the benefits from both worlds and to have higher access to a variety of services (i.e., both cardiovascular and cancer screens). It is also likely that having routine access to both types of providers will increase number of contacts with health services possibly resulting in increases in patient self-efficacy levels in demanding and negotiating preventive care (Walter et al., 2009). An important caveat of this interaction is the availability of health insurance to defray the costs of private care. Cardiovascular checks were more susceptible to access to insurance than were cancer screens, and this may be due to persons who choose to use cancer services being willing to absorb the associated costs due to the perceived gravity of a cancer diagnosis.

Having an NCD was also associated with utilization of cardiovascular and cancer screens; this positive relationship between NCDs and preventive service utilization has been found in other settings (Walter et al., 2009). The highly significant relationship between using preventive services and having a chronic illness is postulated to be bidirectional. Persons with NCDs are likely to have greater interface with PHC; both providers and older adults may have higher perceptions of disease risk, making them more likely to utilize these services to prevent and identify other chronic conditions. In this study, for example, a large proportion of older adults reported having hypertension, and these persons may be more likely to uptake other preventive services such as pap smears and prostate checks due to frequent contacts with health services. The converse relationship between chronic disease and uptake may be that persons who routinely utilize preventive services are more likely to identify a chronic disease than those who avoid being screened. Persons who undertake cancer screens regularly, for example, may be more likely to report ever having cancer or having hypertension.

Cancers

Jamaica has been reported as having the highest prostate cancer incidence and mortality rate worldwide (Aiken, 2011; Gibson, Blake, Hanchard, Waugh, & McNaughton, 2008). The local recommendation is therefore to encourage annual checks (DREs and PSAs) in all men with a life expectancy of at least 10 to 15 years (Aiken, 2011). Prostate screens were reported by 35% of the study population, and although objectively low, the annual uptake is high relative to other settings. In Mexico, older men had a much lower uptake (14%) over twice as long an assessment period (Pagan et al., 2007), whereas Japanese men (40-64 years) had annual uptake of 16% (Tabuchi et al., 2014). This trend held for middle-aged to older men in New Zealand (28%), older men in Costa Rica (30%; Brenes-Camacho & Rosero-Bixby, 2009; van Rij, Dowell, & Nacey, 2013), and American-born men with

Jamaican heritage (29.3%; Gonzalez, Consedine, McKiernan, & Spencer, 2008). Australia was the only country identified as possibly having a higher uptake (47%), but this was assessed over a 2-year period (Weber et al., 2013).

The low uptake of prostate screens may be due to two main reasons, first, local culture and second, international recommendations against this form of screening. The cultural attitude of Jamaican men to shun DREs and of male physicians to be somewhat uncomfortable with providing the service may affect uptake. In one study of senior male physicians in Jamaica, 85% indicated that they believed prostate screens should commence at age 40. In spite of this belief, only 44% encouraged screening for their patients, with 36% reporting that DRE are embarrassing (McNaughton, Aiken, & McGrowder, 2011). This study also found a statistically significant relationship between attitudes toward prostate screens and the actual practice of screening (McNaughton et al., 2011). Barriers identified in other communities of African descent include the perceived discomfort of the DRE, having a male physician and fear (Morrison, Aiken, & Mayhew, 2014).

The low rate may also be due to the international shift recommending against prostate screens because of their high risk of over diagnosis and over treatment (Ilic, Neuberger, Djulbegovic, & Dahm, 2013). The Jamaica Urological Society and the Jamaica Cancer Society, however, both support continued screening based on the high-risk profile of older Jamaican men. Being of African descent acts as a risk factor for disease and also increases risk for more aggressive variants with worse prognosis (Aiken, 2011; Morrison et al., 2014; Powell, 2007). Many international recommendations are based on data from predominantly Caucasian populations, thus negatively skewing the risk-to-benefit ratio that would be found in populations of African descent. In addition to race disparities, one Canadian study found that both prostate screening utilization and detection of aggressive cancers were reduced after the recommendations of the U.S. Preventive Services Task Force (USPSTF) were released (Bhindi et al., 2015). As such, the recommendation in Jamaica has been to continue encouraging annual screens and to call for randomized controlled trials among men of African descent (Aiken, 2011; Ferguson, 2012). It is unclear how much effect the international discourse has had on patient and physician perception and uptake of prostate screening and which of these plays a more dominant role. Further research in this area is needed to better understand the possible shifts in cultural practices and beliefs and to determine how best to address this issue within our context.

In logistic regression, the factors found to be independently and positively associated with utilization of cancer screens included being in the 70 to 79 age group, having a private physician (alone or along with a public provider), and having the NCDs hypertension or cancer. Tabuchi et al. (2014) support the findings of this model;

they found that increasing age, a history of cancer diagnosis, and having a chronic disease were positively associated with increased uptake. It is not surprising that the type of care provider affected uptake of this service, as in private settings, providers may adhere more closely with relevant recommendations and be more willing to ignore their discomfort in providing a DRE. This along with the patient's perception of needing to "get ones money's worth" and a perception of greater discretion in a private setting may result in higher utilization. As indicated before, the relationship between NCDs and preventive screens is likely to be bidirectional, with all assumptions holding for cancer screenings.

Cervical cancer incidence is 4 times higher in Jamaica than in the United States, whereas mortality rates are 6 times higher (Pan American Health Organization, 2011). Cervical cancer screens are recommended every 1 to 3 years for women above the age of 25 years by the MOH; this study reports an annual uptake of 10% among older women. This points to a significantly lower uptake rate in older women, as young to middle-aged Jamaican women have been found to have a 38% uptake in other studies (Bessler, Aung, & Jolly, 2007). Other countries in the Latin America and the Caribbean (LAC) region showed much higher uptake for older women; Mexican women had a 64% uptake over a 2-year period (Pagan et al., 2007) whereas 32% of Costa Ricans screen annually (Brenes-Camacho & Rosero-Bixby, 2009). In the United States, Centers for Disease Control and Prevention (2013) has reported a rate of 64.5% for recent pap smear testing (within 3 years) among women aged 65 years and older.

As with prostate screens, low uptake may be due to cultural attitudes of providers and patients and due to international recommendations that caution against annual cervical cancer screening among average-risk, older women. Culturally, Jamaican women may be inclined to reduce uptake of services associated with sexual and reproductive health as they increase in age. Pap smears are heavily targeted to women of childbearing age, and as such, this screen is associated with younger women. An inverse relationship was found with age, even after adjusting for other variables; this gradient was also found in other studies (Østbye, Greenberg, Taylor, & Lee, 2003). Uptake may also be low due to providers not recommending the screen based on international guidelines. Internationally, pap smears are recommended every 3 to 5 years for women 30 to 65 years, with no pap smears being recommended for women above the age of 65 who have had at least three consecutive normal results (American College of Obstetrics and Gynecology, 2014). Because of low screening uptake in the Jamaican population, the proportion of women with three consecutive smears is likely to be low. This, along with the high cervical cancer incidence and mortality in this population, points to the need for population-specific recommendations.

Mammograms are the only cancer screen assessed that have little controversy with regard to their benefit to older women. The MOH recommends annual screens, and this is supported by the American Cancer Society (2014) which supports screening initiation at age 40 and recommends continuation for as long as women are in good health. Approximately 11% of older women had the screen in the past year; this compares with the 51% reported in Australia (51%; Brenes-Camacho & Rosero-Bixby, 2009; Weber et al., 2013). Reasons for low uptake have been reported in Jamaican populations as being due to the associated breast pain, fear, cost, and reliance on physician referrals (Soares et al., 2009). An additional reason for low uptake may be due to delivery of care issues. Although the MOH recommends mammograms for the relevant age groups, there is no national breast cancer screening program, and mammograms are not available in the public health system. Patients are therefore required to access this service at a significant cost in the private sector, increasing the likelihood of inequitable and low access to this service. After adjusting for covariates, not being in a union and increasing age were identified as barriers to utilization; this was also found in other studies (Østbye et al., 2003). The decreased uptake with increasing age is concerning as the 70 to 79 age group is considered highly functional with low levels of functional disability (Eldemire-Shearer et al., 2013) and would still benefit significantly from mammograms. Having both sources of care was associated with increased uptake, and this was likely through the synergistic mechanism described previously for cardiovascular checks.

Value and policy implications. Government-run PHC is the foundation of the Jamaican health system and was developed to ensure universal access to health care for all Jamaicans, especially the medically vulnerable. The major value of this article stems from the documentation of how low the uptake of clinical preventive services is in this highly vulnerable older population. It points to the urgent need for policy- and service-level improvements if universal access to high-quality and appropriate health care is to be achieved. The low utilization of cardiovascular and cancer screens points to the need for (a) patient and staff education and sensitization campaigns by the MOH, (b) increased staff access to resources, and (c) clear national guidelines on the delivery of preventive services.

Health education and promotion campaigns targeting both health staff and the general public must be undertaken to promote appropriate health-seeking behaviors early in life and throughout the life course. Increased uptake of clinical preventive services in young and middle-aged populations will allow more persons to enter old age in a healthier state. However, a poor perception of the value of preventive care among older persons exists and must be corrected if the benefits of prevention

are to be maximized. One local study points to preventive care for older adults not being widely embraced by either health providers or older adults themselves (Eldemire-Shearer et al., 2009). Focus group discussions highlighted that the older adults believed poor health was inextricably associated with old age and that this could not be altered by preventive interventions. They indicated that medical care was valuable for treatment of acute illnesses (i.e., tertiary prevention) only but that primary and secondary prevention were “new age” and unnecessary.

Education/re-orientation campaigns will also be needed for health staff themselves, as similar attitudes toward prevention in old age were expressed by staff in these focus groups. Staff were generally of the opinion that it was too late to undertake preventive actions in this cohort as the “damage has already been done” and the effort would be in vain as older persons were “miserable, difficult and set in their ways” (Eldemire-Shearer et al., 2009). This belief is compounded by the implications of operating in a no-user fee setting. Both doctors and nurses complain of high patient burden, with insufficient time to spend providing thorough and appropriate care for patients (Caribbean Policy Research Institute, 2013). Staff support of non-acute, non-urgent preventive measures may therefore be more likely if there is sufficient consultation time available for these preventive checks. Having workshops and sensitization sessions to educate staff on the importance of all levels of prevention in older adults, extending operating hours in clinics, increasing the staff numbers, and equipping them with the resources to provide these services are therefore critical to increasing uptake. In an effort to increase uptake of prostate exams, educational/sensitization sessions should also include components aimed at addressing the cultural discomfort/stigma associated with undertaking DREs.

In addition to policies aimed at reducing patient burden and increasing consultation time, increased service availability and staff access to resources may improve utilization of clinical preventive services. The absence of mammography machines or regular pap smears supplies (e.g., cyto brushes, fixatives, and slides) in the public health system, for example, is likely to act as a barrier to service utilization. The limited capacity of public laboratories to provide timely results of pap smears is also likely to act as a deterrent for public doctors to screen older women, who are seen to be at lower risk. Increasing access to preventive services in the public sector is likely to increase utilization among those who are unable to access private services; these are likely to be the medically vulnerable and those most in need of care. The cost to the government to provide a continuous supply of reagents and screening equipment for the provision of these services is likely to be mitigated by the long-term benefits of reduced hospitalizations and increased availability of persons for the labor forces.

Finally, clear national-level guidelines about the delivery of clinical preventive services should be developed and made available to health staff both in the public and private sectors. These guidelines should clearly outline what services are to be delivered and the age/circumstances under which the services should be targeted and then ceased. These recommendations must be made within a wider international context, highlighting any incongruence with international literature and making clear the Jamaican position on the issues. This may help local health staff make more informed decisions with regard to the patients they serve, as they may require less cognitive effort to search for international evidence and to assess and weigh these findings within the Jamaican context.

Strengths and limitations. This article represents the only nationally representative survey in Jamaica looking at the utilization of preventive services among older Jamaicans, and therefore adds to the Jamaican and international body of knowledge. The study’s large sample size, the analytic techniques used to adjust for multiple covariates, and the Hosmer–Lemeshow goodness-of-fit tests of model fitness also increase study validity.

A few limitations were noted due to the nature of a cross sectional study design. Causality/temporality of the relationship between chronic disease status and utilization of preventive services could not be established. Recall of up to 12 months was required from the respondents making recall bias a possibility; 12 months was thought to be the shortest time frame feasible to assess uptake of preventive services, which are offered at 1-year or greater intervals. Doctor-diagnosed, self-reports of chronic disease may be affected by disease familiarity and diseases prevalence; others have documented this method as reliable, however (Miller et al., 2008; Short et al., 2009). With regard to variable inclusion, dyslipidemia prevalence was not assessed in the survey, and as such could not be included as a health condition in the regression models. The presence of hypertension, diabetes, and coronary heart disease may compensate to some extent for the absence of this variable.

Conclusion

The utilization of preventive services varies in the older adult population. Services aimed at preventing/managing CVD were the most utilized, with much room for improvement for cancer checks. The underutilization of preventive services in this high-risk population points to significant missed opportunities to prevent disease and disability, resulting in unnecessary individual and national financial and social costs. Age, source of routine care (whether public, private, or both), and presence of a chronic disease were identified in this population as significant independent factors affecting utilization. Sensitization of caregivers and older adults of the need

for secondary and tertiary prevention activities, and increasing access in primary care settings will be important in improving uptake.

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