

Breast Cancer in Jamaica: Trends From 2010 to 2014—Is Mortality Increasing?

Sonya Reid, MD, MPH¹; Kayon Donaldson-Davis, MBBS²; Douladel Willie-Tyndale, PhD²; Camelia Thompson, MPH²; Gilian Wharfe, MD²; Tracey Gibson, MBBS²; Denise Eldemire-Shearer, MBBS, PhD²; and Kenneth James, MBBS²

PURPOSE This study sought to provide a detailed analysis of breast cancer–specific mortality in Jamaica on the basis of reported deaths between 2010 and 2014.

METHODS A cross-sectional study was done to analyze breast cancer–specific mortality data from the Registrar General’s Department, the statutory body responsible for registering all deaths across Jamaica.

RESULTS A total of 1,634 breast cancer–related deaths were documented among Jamaican women between 2010 and 2014, which accounted for 24% of all female cancer deaths. The age-standardized breast cancer mortality rate increased from 21.8 per 100,000 in 2010 to 28 per 100,000 in 2014 for the total female population. The overall difference in breast cancer mortality rates between the 2014 and 2010 rates was not statistically significant ($P = .114$). Analysis of the year-by-year trend reflected by the annual percentage of change did show, however, a statistically significant increasing trend in breast cancer mortality ($P = .028$). Mortality rates varied by age, with statistically significant annual increases observed in the 35–44–, 65–74–, and ≥ 75 -year age groups ($P = .04$, $.03$, and $.01$, respectively).

CONCLUSION Breast cancer remains the leading cause of cancer-related death among Jamaican women. Despite global advances in breast cancer screening and management, breast cancer remains a major public health challenge and represents a public health priority in Jamaica. The increasing breast cancer–specific mortality in Jamaica over the 5-year period contrasts with decreasing mortality rates among US women with breast cancer. This study highlights the critical need to address the implementation of a national organized breast cancer screening program in Jamaica and to focus future research efforts on the biology of breast cancer, especially among young Jamaican women.

JCO Global Oncol 6:837-843. © 2020 by American Society of Clinical Oncology

Creative Commons Attribution Non-Commercial No Derivatives 4.0 License 

INTRODUCTION

Breast cancer is the most common cancer among women worldwide, with an estimated 2 million new cases diagnosed in 2018.¹ Breast cancer is believed to be a disease of the developed world, with the highest incidence rate of 92.6 per 100,000 reported in Western Europe in 2018.¹ Although one of the lowest incidence rates in 2018 was observed in Africa (27.9 per 100,000), mortality rates are higher in Africa and other developing countries and account for 58% of breast cancer deaths worldwide.¹ Breast cancer survival rates vary greatly worldwide, ranging from 40% in developing countries to 80% in North America, Sweden, and Japan.² Survival rates have been steadily improving in developed countries over the past several decades.³ These improvements, however, have not been shared equally, as Black women in the United States are still more likely to die as a result of their disease compared with their non-Hispanic White

counterparts, with an approximately 40% higher death rate.^{4,5} This racial survival disparity among women with breast cancer is undoubtedly complex and likely is an interplay among tumor biology, genomics, patterns of care, and socioeconomic factors.^{3,6} This difference is particularly pronounced among younger women diagnosed before 50 years old. The low survival rates in developing countries are multifactorial, however, and are largely believed to be due to lack of early detection and inadequate diagnostic and treatment options.⁷

Jamaica is the largest island in the English-speaking Caribbean, with a predominantly (90%) Black population.⁸ It is considered to have an upper-middle-income economy but continues to experience financial struggles as a result of low growth, high public debt, and vulnerabilities to natural disasters.⁹ Jamaica is geographically composed of 14 parishes with a population of approximately 2.9 million inhabitants according to postcensus estimates by the Statistical Institute

Author affiliations and support information (if applicable) appear at the end of this article.

Accepted on May 18, 2020 and published at ascopubs.org/journal/go on June 17, 2020; DOI <https://doi.org/10.1200/GO.20.00022>

CONTEXT

Key Objective

Has there been a change in breast cancer–specific mortality among Jamaican women? This is a critical public health question that this study aimed to answer. This study reflects data from the Registrar General’s Department (the official national death registry in Jamaica) on breast cancer mortality. This is the most updated study since 1999 to assess breast cancer mortality and, therefore, will have public health relevance.

Knowledge Generated

In Jamaica, the age-standardized breast cancer mortality rate increased from 21.8 per 100,000 in 2010 to 28 per 100,000 in 2014 for the female population. The highest annual percentage change in breast cancer mortality rate was observed in the 35–44-, 65–74-, and ≥ 75 -year age groups.

Relevance

The annual increases in breast cancer mortality rates among younger (35–44 years) and older (≥ 75 years) Jamaican women is concerning given that these age groups are typically excluded from the recommended guidelines for breast cancer screening used by providers in Jamaica.

of Jamaica (STATIN).¹⁰ Jamaica has one of the highest incidence rates for breast cancer in the Caribbean, with a reported age-standardized incidence rate of 43 per 100,000 in 2007 (the most current year available).¹¹

Women in Jamaica tend to have more aggressive disease associated with earlier ages at diagnosis, higher grade, and advanced stages at presentation compared with women in developed countries.¹² Prior studies have shown a high prevalence of estrogen receptor (ER)–negative/human epidermal growth factor receptor 2 (HER2)–negative breast cancer among women at the University Hospital of the West Indies. The prevalence of ER/HER2-negative tumors in Jamaica is 28%–33%, which is twofold higher than the rates of triple-negative breast cancer (TNBC) seen in developed countries.^{13,14}

Breast cancer mortality rates remain high compared with other countries, despite campaigns and increased breast cancer awareness.¹⁵ Given the high mortality burden, the Minister of Health in 2018 described several imperatives at the launch of the National Cancer Registry, which include describing the burden and distribution of cancer, monitoring the impact of cancer prevention and control activities, and identifying areas for research to better understand risk factors in Jamaica.¹⁶ Success in preventing and managing breast cancer is contingent upon the availability of accurate and current data. To our knowledge, prior mortality reports have been largely based on estimated deaths and internationally derived models. There is only one previous report on cancer mortality in Jamaica¹⁷ that is based on actual data from the Registrar General’s Department (RGD), the official national registry of all births and deaths, and this covered only the year 1999. From this study, the age-standardized breast cancer mortality rate in Jamaica was found to be 30.1 per 100,000.¹⁷ Since 1999, we believe our current study is the first to provide an updated analysis of breast cancer–specific mortality that is based on actual reported deaths from the RGD.

METHODS

Data Collection

In this study, breast cancer deaths were obtained from the RGD, the only statutory body responsible for registering all deaths across Jamaica. The RGD was first established in 1879 and expanded to include 9 regional offices. It is an executive agency of the Jamaican government that serves as the backbone for the national vital statistics framework.^{18,19} We undertook a secondary analysis of mortality data from the RGD for the period 2010–2014 (5 years). Cause-specific mortality data were obtained from the medical certificate of cause of death from both public and private health sectors. For breast cancer–specific mortality, we included deaths that met the International Classification of Diseases, 10th Revision, topography code C50 for malignant neoplasms of the breast.

The study entails a census of deaths from all 14 parishes for the period 2010–2014. Only female deaths attributed to invasive breast cancer were included; deaths that occurred in women with a diagnosis of ductal carcinoma in situ were not listed as a primary cause of death from the RGD records. All deaths before January 1, 2010, and after December 31, 2014, were also excluded.

Statistical Analysis

Crude mortality rates were calculated using total breast cancer deaths in women as a proportion of the total female (≥ 25 years) midyear population for each of the 5 years (2010–2014). Breast cancer occurrence before age 25 years is rare, and therefore, patients < 25 years of age were excluded.^{1,20,21} Similarly, age-specific mortality rates were calculated using the relevant totals for each age-group. Age-standardized rates were calculated using the Jamaican annual census population data for each of the years from 2010 to 2014, using data obtained from STATIN, which is the official national agency responsible for collecting census data. The direct method of standardization used

the WHO World Standard Population (2000-2025) as the standard. Decennial age groups were used in the age-standardization process.

Data were analyzed using Microsoft Excel software (Microsoft Corporation, Redmond, WA). Univariable data were summarized using tables and charts. CIs were also generated for rates to provide estimates that pertained to precision and variability. Differences between the 2014 and 2010 age-standardized rates were assessed using binomial and Poisson probabilities. The annual percentage rate of change (APC) was determined using linear regression to assess the 5-year mortality trend. In the linear regression model used, the mortality rate was the dependent variable, and year was the independent predictor variable. The regression coefficient obtained was then interpreted as the annual rate of change per 100,000 (ie, slope). The APC was subsequently calculated by dividing the regression coefficient by 100,000 and then multiplied by 100.

RESULTS

From 2010 to 2014, there were 1,634 death certificates in Jamaica that cited breast cancer as the principal cause of death. Table 1 lists the annual crude and age-standardized breast cancer mortality rates with corresponding CIs. In Jamaica, the breast cancer age-standardized mortality rate increased from 21.8 per 100,000 in 2010 to 28 per 100,000 in 2014. The overall difference in breast cancer mortality rates between the 2014 and 2010 rates was not statistically significant ($P = .114$). Analysis of the year-by-year trend reflected by the APC showed a statistically significant increasing trend in breast cancer mortality ($P = .028$). Determined by linear regression, the APC was 0.0015% (95% CI, 0.0003% to 0.002%) and is graphically shown in Figure 1. Mortality rates also varied by age, with the highest rate observed in the ≥ 75 -year age group and the lowest rate observed in the 25-34-year age group (Table 2; Fig 2). In particular, statistically significant increases in the APC for the 35-44-, 65-74-, and ≥ 75 -year age groups were observed, with rates of 0.003%, 0.009%, and 0.012%, respectively. These were derived from the regression coefficients of 3.28, 8.59, and 12.74 per 100,000, respectively (Table 2). Among the significant APCs, the highest value was noted in the ≥ 75 -year age group and the lowest in the 35-44-year age group.

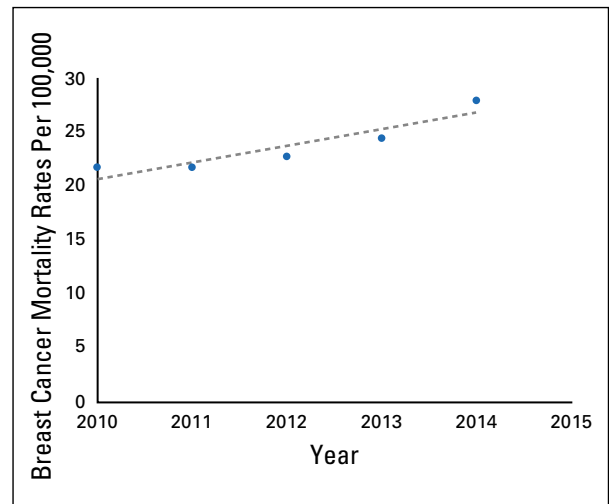


FIG 1. Age-standardized breast cancer mortality rate (per 100,000) in Jamaica, 2010-2014. Age-standardized rate calculated using WHO World Standard Population (2000-2025).

DISCUSSION

Breast cancer remains the leading cause of cancer-related death among Jamaican women.²² The breast cancer age-standardized mortality rate in Jamaica in 2014 is higher (28 per 100,000) than that of the United States among non-Hispanic White women (20.3 per 100,000) but comparable to that among US Black women (28.4 per 100,000) from 2013 to 2017.²³ Despite a much lower age-standardized incidence rate in Jamaica (43 per 100,000 from 2007)¹¹ compared with the United States (124.2 per 100,000 from 2016),²⁴ mortality rates are similar between the 2 countries.

The data presented in our study demonstrate statistically significant increases in annual breast cancer mortality rates (Fig 1). Possible explanations for increases in annual mortality rates can be multifactorial and may include improved quality of vital status reports, improved diagnostic and treatment methods, changing demographic composition, and improved screening programs. The significant annual percentage increase in breast cancer mortality rate in Jamaica over the 5-year period is of public health concern. Improvements in widespread screening, early detection, and access to standard-of-care treatment have resulted in a steady decrease in the breast cancer mortality

TABLE 1. Breast Cancer Mortality in Jamaica, 2010-2014

Year	Female Population (No.)	Breast Cancer Deaths (No.)	Crude Death Rate Per 100,000 (95% CI)	ASR Per 100,000 (95% CI)
2010	786,495	286	36.4 (32.2 to 40.6)	21.8 (18.5 to 25.1)
2011	762,212	294	38.6 (34.2 to 43.0)	21.8 (18.4 to 25.1)
2012	777,395	315	40.5 (36.0 to 45.0)	22.8 (19.4 to 26.2)
2013	783,597	346	44.2 (40.0 to 48.9)	24.5 (21.0 to 28.0)
2014	785,396	393	50.0 (45.0 to 55.0)	28.0 (24.3 to 31.7)

NOTE. Age-standardized rate (ASR) calculated using WHO World Standard Population (2000-2025).

TABLE 2. Annual Rates of Change in Breast Cancer Mortality, 2010-2014

Age Group (years)	Slope	P
25-34	-0.29	.267
35-44	3.28	.039
45-54	2.37	.289
55-64	-0.06	.986
65-74	8.59	.034
≥ 75	12.74	.011

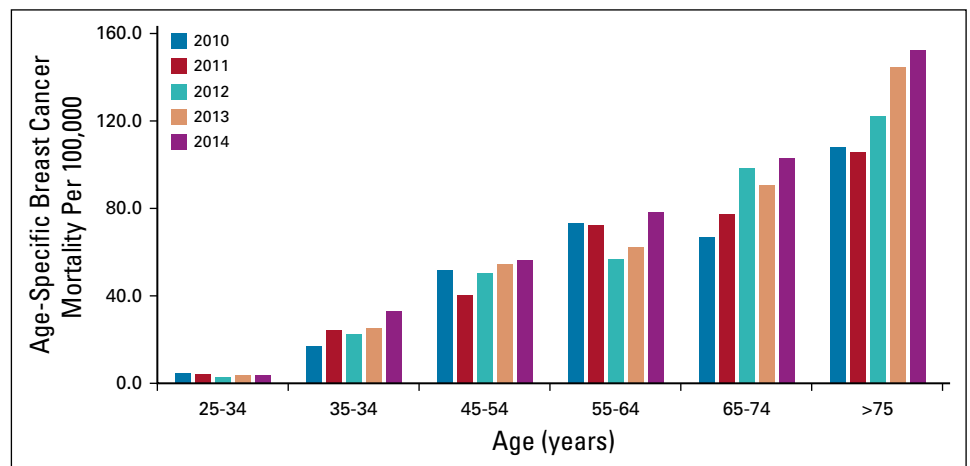
NOTE. All slope values are per 100,000.

rate in the United States over the past 2 decades.²³ In Jamaica, primary prevention strategies (eg, mammography) have been a public health focus, but there is still no national organized breast cancer screening.²² In addition, without access to standard-of-care therapies, the overall impact of screening may be minimized. Increases in breast cancer incidence rates may also be partly responsible for the annual percentage increase noted over the study period. Data from the Jamaica Cancer Registry showed an increase in incidence from 43.1 per 100,000 per year for the period 2003-2007¹¹ to 45.7 per 100,000 per year for the period 2008-2011.²⁵ However, the incidence rate for Jamaica is derived from the Kingston and St Andrew Cancer Registry, which only accounts for 24% of the population and, thus, may be an over- or underestimation. Future efforts will need to focus on comparing breast cancer incidence and mortality rates over the same study period across the entire Jamaican population.

In Jamaica, a significant increase in the APC for breast cancer mortality over the 5-year period was observed in the 35-44-year age group. Globally, breast cancer is the leading cause of cancer-related deaths among women < 45 years of age.²⁶ Our findings are similar to global trends, which have shown an increase in breast cancer mortality among young women in whom the disease usually has a more aggressive biology.²⁶ Young women with breast

cancer have inferior survival rates and a higher incidence of negative clinicopathological features.²⁷ US-based studies have demonstrated that younger women are diagnosed at more advanced stages with disproportionately higher rates of TNBC and HER2-positive breast cancer, resulting in higher recurrence rates.²⁷ In addition, Black women have the highest incidence rate of breast cancer at age < 45 years compared with other racial and ethnic groups.²⁰ The upward trend in breast cancer mortality among young Jamaican women over the 5-year period may be due to an increase in incidence rate and more aggressive disease. Young women between 35 and 44 years of age warrant attention because they are typically at the peak age of economic productivity, many sandwiched between the responsibilities of raising children and being caregivers to their own aging parents.

Second to being female, increasing age is the most important risk factor for breast cancer.²⁸ Consistent with global trends,¹² there was an increase in breast cancer mortality with age among Jamaican women, with the highest mortality rate observed in the ≥ 75-year age group (Figs 2 and 3). In addition, among the ≥ 75-year age group, there was an increase in mortality rate in breast cancer over the 5-year period. This is similar to prior studies that showed increasing mortality rates in the > 70-year age group in developing countries and contrasts with decreasing rates in developed countries.²⁹ The upward trends observed in the ≥ 75-year age group may reflect both an increasing median age in this group and a concomitant increased cumulative risk from exposures across an individual's lifetime. The recommended age to discontinue breast cancer screening is 74 years³⁰; however, this does not take into consideration the natural history of diseases relative to increases in life expectancies (eg, Jamaica's life expectancy at 60 years old is 21 years).³¹ In addition, given the increased likelihood of comorbidities, functional limitations, and the possibility of complications, older adults (≥ 60 years) are at risk for undertreatment.³² Older women with breast cancer are commonly not offered evidence-based management

FIG 2. Breast cancer mortality rates by age group in Jamaica, 2010-2014.

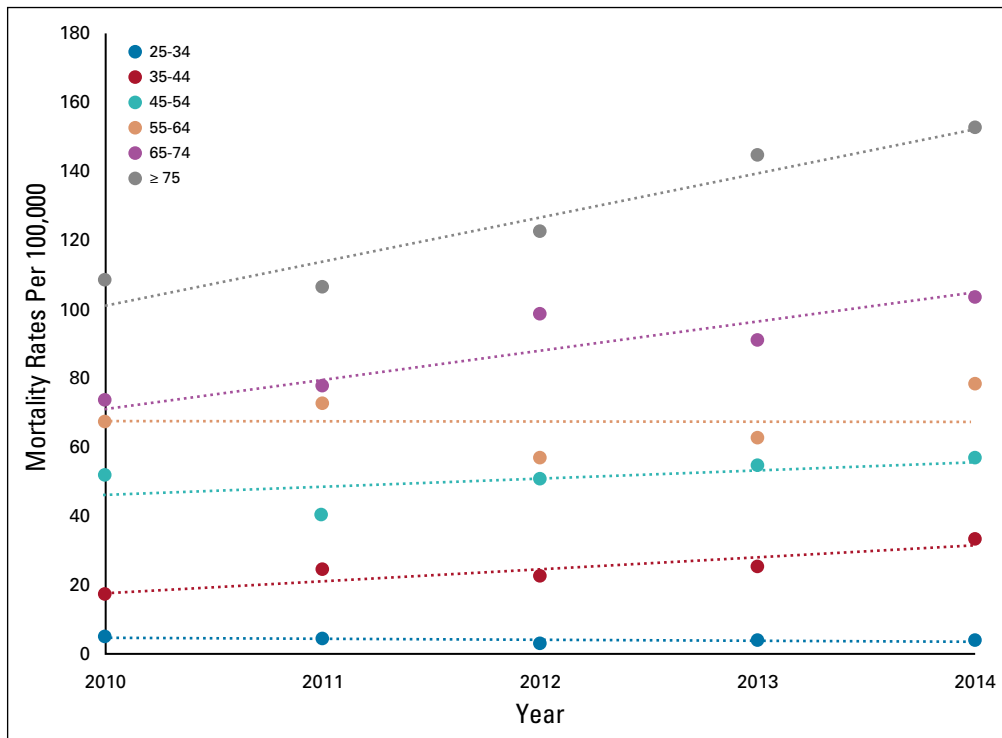


FIG 3. Age-specific breast cancer mortality rate (per 100,000) in Jamaica, 2012-2014.

(including surgery), despite good functional status and limited comorbidities.^{33,34} This potential health disparity may be a potential explanation for the pattern of breast cancer mortality rates among older adults observed in this study. This has significant public health implications given that the older adult age group is the fastest growing segment of the Jamaican population. Present estimates indicate that 185,032 Jamaican women are age > 60 years.¹⁰ Jamaica's population is projected to increase to 2,872,000 by 2030, with females comprising approximately 51.0% of the total population.³⁵ Older adults currently account for approximately 12.6% of the Jamaican population, with a projection to increase up to 25% by 2050.³⁵

In addition to an increase in the number of older adults in the population, many system factors can account for increasing cancer mortality rates over time, including lack of national screening programs, limited access to screening among women of low socioeconomic status, lack of mammography machines in the public health sector, competing financial priorities within and outside the health sector, long waiting periods within the public hospitals for women to access treatment, and high cost of private treatment.³⁶ It is important to acknowledge these factors to improve targeted health promotion initiatives, which can prevent delays in treatment among older women, increase early detection, and decrease breast cancer mortality rates.

Our study has several strengths. To our knowledge, this study is the first to provide a detailed analysis of breast cancer-specific mortality rates on the basis of reported

deaths from Jamaica's central vital registry, the RGD. Cause-specific mortality data were obtained from the medical certificate of cause of death from both public and private health sectors. Population totals for the 2010-2014 period were derived from postcensus estimates from the most recent and relevant census done in 2011. Misclassification of cause of death and under-reporting are recognized limitations. Hence, mortality rates may be over- or underestimated. In this study, we were not able to access data on fatality rates because the cancer registry data do not reflect breast cancer prevalence across Jamaica.

Despite global advances in breast cancer screening and management, breast cancer remains a major public health challenge and is a public health priority in Jamaica. The high breast cancer mortality rate is of concern, and its reduction will require multilevel implementation strategies. There have been successful reductions in breast cancer mortality rates in developed countries with widespread screening, and therefore, the implementation of a national organized screening program is a potential strategy to reduce breast cancer mortality rates locally. Our data also highlight the critical need to further understand the biology of breast cancer among younger Jamaican women, who are often diagnosed below the recommended age for breast cancer screening according to National Comprehensive Cancer Network guidelines.³³ Additional studies are needed to focus on trends in incidence rates across age-groups and their relationship to mortality as well as trends in the distribution of breast cancer subtypes among Jamaican women.

AFFILIATIONS

¹Vanderbilt University Medical Center, Nashville, TN

²The University of the West Indies, Mona Campus, Kingston, Jamaica

CORRESPONDING AUTHOR

Sonya Reid, MD, MPH, Vanderbilt University Medical Center/Vanderbilt-Ingram Cancer Center, 2220 Pierce Ave, Nashville, TN 37232; Twitter: @SonyaReid07; e-mail: sonya.reid@vumc.org.

SUPPORT

Support for S.R.'s time was provided by a National Cancer Institute T32 training grant awarded to Vanderbilt University (T32 CA160056).

AUTHOR CONTRIBUTIONS

Conception and design: Sonya Reid, Kayon Donaldson-Davis, Douladel Willie-Tyndale, Gilian Wharfe, Tracey Gibson

Administrative support: Kayon Donaldson-Davis

Provision of study material or patients: Kayon Donaldson-Davis, Denise Eldemire-Shearer

Collection and assembly of data: Sonya Reid, Kayon Donaldson-Davis, Douladel Willie-Tyndale, Denise Eldemire-Shearer

Data analysis and interpretation: Sonya Reid, Kayon Donaldson-Davis, Camelia Thompson, Gilian Wharfe, Tracey Gibson, Kenneth James

Manuscript writing: All authors

Final approval of manuscript: All authors

Accountable for all aspects of the work: All authors

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

The following represents disclosure information provided by authors of this manuscript. All relationships are considered compensated unless otherwise noted. Relationships are self-held unless noted. I = Immediate Family Member, Inst = My Institution. Relationships may not relate to the subject matter of this manuscript. For more information about ASCO's conflict of interest policy, please refer to www.asco.org/rwc or ascopubs.org/jgo/site/misc/authors.html.

Open Payments is a public database containing information reported by companies about payments made to US-licensed physicians ([Open Payments](http://OpenPayments)).

Gilian Wharfe

Honoraria: AbbVie, Roche, SERVIER, Merck

Speakers' Bureau: Roche, AbbVie

Travel, Accommodations, Expenses: Roche, SERVIER, Merck, Janssen Pharmaceuticals

Tracey Gibson

Honoraria: Roche (I)

Travel, Accommodations, Expenses: Janssen Pharmaceuticals (I)

No other potential conflicts of interest were reported.

REFERENCES

- Bray F, Ferlay J, Soerjomataram I, et al: Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 68:394-424, 2018
- Bastos J, Peleteiro B, Gouveia J, et al: The state of the art of cancer control in 30 European countries in 2008. *Int J Cancer* 126:2700-2715, 2010
- Davis MB, Newman LA: Breast cancer disparities: How can we leverage genomics to improve outcomes? *Surg Oncol Clin N Am* 27:217-234, 2018
- Huo D, Hu H, Rhie SK, et al: Comparison of breast cancer molecular features and survival by African and European ancestry in The Cancer Genome Atlas. *JAMA Oncol* 3:1654-1662, 2017
- DeSantis CE, Ma J, Gaudet MM, et al: Breast cancer statistics, 2019. *CA Cancer J Clin* 69:438-451, 2019
- Daly B, Olopade OI: A perfect storm: How tumor biology, genomics, and health care delivery patterns collide to create a racial survival disparity in breast cancer and proposed interventions for change. *CA Cancer J Clin* 65:221-238, 2015
- Torre LA, Islami F, Siegel RL, et al: Global cancer in women: Burden and trends. *Cancer Epidemiol Biomarkers Prev* 26:444-457, 2017
- World Population Review: Jamaica Population 2020. <https://worldpopulationreview.com/countries/jamaica-population/>
- The World Bank: The World Bank in Jamaica, 2020. <https://www.worldbank.org/en/country/jamaica/overview>
- Statistical Institute of Jamaica: Population census, 2011. <https://statinja.gov.jm>
- Gibson TN, Hanchard B, Waugh N, et al: Age-specific incidence of cancer in Kingston and St. Andrew, Jamaica, 2003-2007. *West Indian Med J* 59:456-464, 2010
- Shirley SE, Sinclair PA, Stennett MA, et al: The pathology of breast cancer in Jamaica: The National Public Health Laboratory study. *West Indian Med J* 59:177-181, 2010
- Alfred R, Chin SN, Williams E, et al: The prevalence and significance of oestrogen receptor (ER) positivity in breast cancer at the University Hospital of the West Indies, Jamaica. *West Indian Med J* 61:795-801, 2012
- Chin SN, Green C, Strachan GG, et al: Clinicopathologic characteristics of breast cancer in Jamaica. *Asian Pac J Cancer Prev* 15:3319-3322, 2014
- Soares D, Kirlaw K, Johnson P, et al: Mammographic referral patterns for two breast imaging units in Jamaica. *West Indian Med J* 56:159-162, 2007
- Clarke P: Jamaica now has a national cancer registry, 2018. <http://jamaica-gleaner.com/article/lead-stories/20181212/jamaica-now-has-national-cancer-registry>
- Blake G, Hanchard B, Mitchell K, et al: Jamaica cancer mortality statistics, 1999. *West Indian Med J* 51:64-67, 2002
- Registrar General Department: History. <https://www.rgd.gov.jm/index.php/about-us/history>
- Jamaica Information Service: RGD lauded for providing data, 2006. <https://jis.gov.jm/rgd-lauded-for-providing-data>
- Shoemaker ML, White MC, Wu M, et al: Differences in breast cancer incidence among young women aged 20-49 years by stage and tumor characteristics, age, race, and ethnicity, 2004-2013. *Breast Cancer Res Treat* 169:595-606, 2018
- Brinton LA, Sherman ME, Carreon JD, et al: Recent trends in breast cancer among younger women in the United States. *J Natl Cancer Inst* 100:1643-1648, 2008
- Spence D, Dyer R, Andall-Brereton G, et al: Cancer control in the Caribbean island countries and territories: Some progress but the journey continues. *Lancet Oncol* 20:e503-e521, 2019
- American Cancer Society: Breast Cancer Facts & Figures 2019-2020. Atlanta, GA, American Cancer Society, 2019

24. US Cancer Statistics Working Group: US Cancer Statistics Data Visualizations Tool, based on November 2018 submission data (1999-2016): US Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute, June 2019. <http://www.cdc.gov/cancer/dataviz>
 25. Hanchard B, Gibson T, McNaughton D: Cancer incidence in Jamaica (2008–2011), in: Forman D, Bray F, Brewster DH et al (eds): Cancer Incidence in Five Continents, Vol XI [electronic version]. Lyon, France, International Agency for Research on Cancer, 2017
 26. Anastasiadi Z, Lianos GD, Ignatiadou E, et al: Breast cancer in young women: An overview. *Updates Surg* 69:313-317, 2017
 27. Anders CK, Hsu DS, Broadwater G, et al: Young age at diagnosis correlates with worse prognosis and defines a subset of breast cancers with shared patterns of gene expression. *J Clin Oncol* 26:3324-3330, 2008
 28. Moser K, Patnick J, Beral V: Do women know that the risk of breast cancer increases with age? *Br J Gen Pract* 57:404-406, 2007
 29. Hu K, Ding P, Wu Y, et al: Global patterns and trends in the breast cancer incidence and mortality according to sociodemographic indices: An observational study based on the global burden of diseases. *BMJ Open* 9:e028461, 2019
 30. US Preventive Services Task Force: Breast cancer: Screening, 2016. <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/breast-cancer-screening>
 31. HelpAge International: Life expectancy at 60, 2014. <https://www.helpage.org/global-agewatch/population-ageing-data/life-expectancy-at-60>
 32. Ugurlu MU, Gulluoglu BM: Impact of older age on local treatment decisions. *Breast* 48:S57-S61, 2019
 33. National Comprehensive Cancer Network: Breast cancer (version 3.2020), 2020. https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf
 34. Tesarova P: Breast cancer in the elderly-should it be treated differently? *Rep Pract Oncol Radiother* 18:26-33, 2012
 35. Ministry of Health and Wellness: Chronic non-communicable diseases. <https://www.moh.gov.jm/programmes-policies/chronic-non-communicable-diseases>
 36. International Cancer Control Partnership: Strategic plan and action plan for the prevention and control of cancer in Jamaica 2013-2018. <https://www.iccp-portal.org/plans/strategic-plan-and-action-plan-prevention-and-control-cancer-jamaica-2013-2018>
-