THE UNIVERSITY OF THE WEST INDIES

Barbados National Registry

# Cancer in Barbados 2014

The George Alleyne Chronic Disease Research Centre

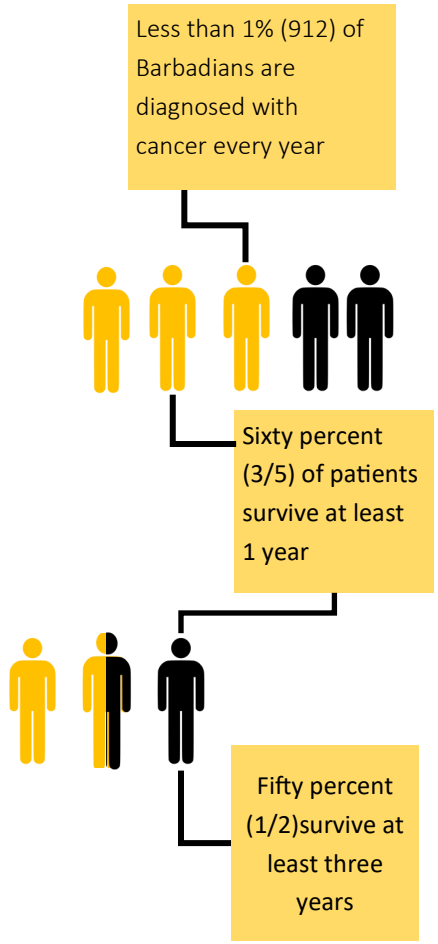
CAIHR
CARIBBEAN INSTITUTE FOR HEALTH RESEARCH

# Contents



# Executive Summary

Cancer is a group of diseases characterised by the uncontrolled growth and spread of abnormal cells. The accurate and complete collection of information on cancer cases, treatment and outcomes is critical for patient care improvement, public health program planning and effective use of financial resources. These activities may lead to better cancer prevention and control and an overall reduction in the burden of cancer. Cancer is the leading cause of death in developed countries and the second leading cause of death in developing countries.[1] In the Caribbean, cancer is the second most common cause of death, with cardiovascular disease leading the mortality burden. This report provides data on the burden of cancer in Barbados in 2014 by describing the incidence, mortality and survival of all cancers (except non-melanoma skin cancers). Given their relative importance in cancer burden, the report also highlights key issues around prostate, breast, colo-rectal and lung cancers.




In 2014, there were 912 persons diagnosed with malignant (889) or premalignant (23) tumours in Barbados. This represents less than 1% of the total population (Table 1). The age standardised* incidence rate (ASIR) based on these figures was 237 per 100,000, indicating that for every 100,000 persons in the population, approximately 237 were diagnosed with cancer. As occurs globally, the incidence rate for men (266 per 100,000) in Barbados was higher than that for women (218 per 100,000). Global averages are 219 per 100, 000 for men and 183 per 100,000 for women.[2] Our rates and incidence which are higher than the global average are similar to those seen in developed countries where rates may be as high as 468 per 100,000 in countries like Australia[2]. The top cancer sites in 2014 were prostate and breast cancer. The age-standardised incidence rate (ASIR) for prostate cancer was 111 per 100,000 which is one of the top five highest prostate cancer rates seen globally. Breast cancer was the most common cancer among women with an ASIR of 74 per 100,000.

*Rates are standardised to the World Health Organization (WHO) population

1. World Health Organization Factsheet, https://www.who.int/news-room/fact-sheets/detail/cancer
2. Max Roser and Hannah Ritchie (2019) - "Cancer". Published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/cancer

One year after diagnosis of all cancers, 59% of persons were alive while 48% were alive after three years. In the United Kingdom 2010-2011 statistics showed that 70% of adults survived their disease after one year[3]. While net survival at 3 years was approximately 59%.

Our age-standardised mortality rates (ASMR) increased from 113 per 100,000 (95% CI 103.0-124.3) in 2008 to 149 per 100,000 (95% CI 137.2-161.4) in 2014. The latter figure (2014) was similar to that found in 2013: ASMR—136.3 per 100,000 (95% CI 125.0-148.4). There are several possible reasons for the increases in ASMR including: increased diagnosis of cancers because of better screening uptake and more advanced technology and population ageing and growth.

The social and biological determinants of the high incidence and mortality rates of prostate cancer must be explored further. Further data on staging and treatment of disease is needed to explore factors contributing to the relatively low and unchanging survival rates.

**Table 1. Summary statistics for the BNR-Cancer, 2014, (Population†=277,814)**

| | Cancers (all) | Cancers (all) | Cancers (all) |
|---|---|---|---|
| **Year** | **2014** | **2013** | **2008** |
| **Reporting obligations** | | | |
| **No. registrations (tumours) (% of entire population)** | 927 (0.33%) | 845 (0.30%) | 838* (0.30%) |
| **No. registrations (patients)** | 912 | 831 | 829 |
| **Age-standardised Incidence Rate (ASIR) per 100,000** | 236.7 | 219.6 | 214.6 |
| **No. registered by death certificate only (% of tumours registered)** | 72** (7.7%) | 43 (5.1%) | 51 (6.1%) |
| **1-year survival *** ** | 59.4% | 64.7% | 65.7% |
| **3-year survival** | 48.0% | 50.4% | 49.9% |

†Note: Population data from Barbados 2010 census, adjusted for undercount. Barbados Statistical Service. Barbados Population and Housing Census, 2010. Bridgetown, Barbados, Sep-2013. Available at: http://www.barstats.gov.bb/files/documents/PHC_2010_Census_Volume_1.pdf (Accessed 05 Dec 2017)

*Note: This excludes non-reportable skin cancers (basal and squamous cell carcinoma of skin, non-genital areas) and pre-invasive tumours (except CIN 3) to match the BNR case definition used for 2014 diagnoses

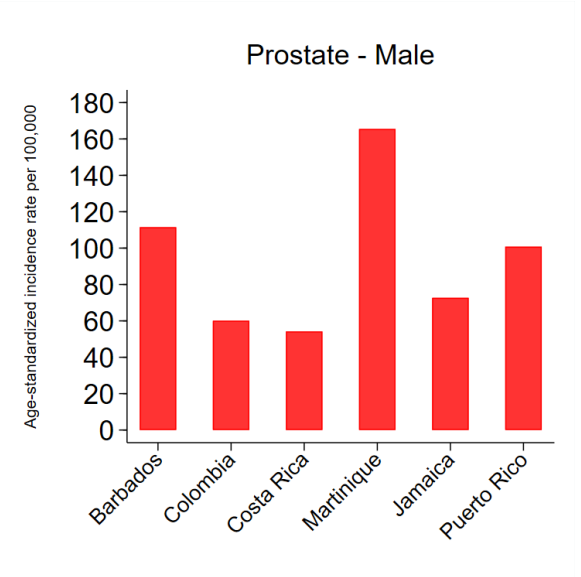
** Death Certificate Only (DCOs) - the reviewed data indicates that 99% of the DCOs could not be tracked back because of the refusal of some private physicians to allow the BNR to access this information

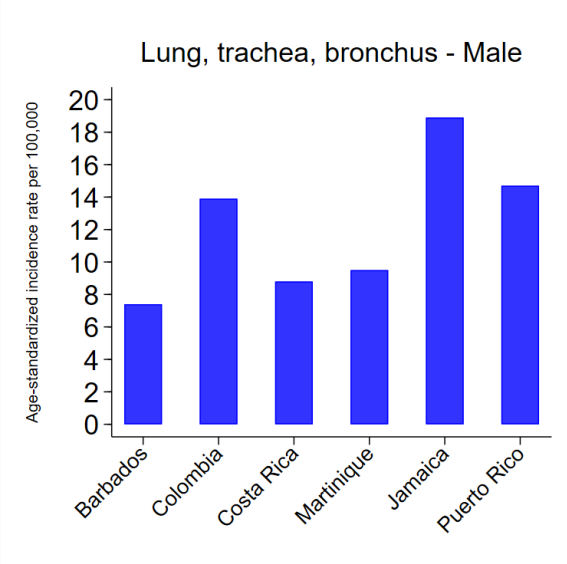
***Survival percentages were determined based on first matching cancer cases with national death data then calculating end dates for each case based on 1 year and 3 years from date of diagnosis

3. Cancer Research UK, https://www.cancerresearchuk.org/health-professional/cancer-statistics/survival, Accessed June 2019

# Key Messages

- Barbados has one of the highest prostate cancer incidence and mortality rates globally based on figures from countries with adequate surveillance systems (ASIR—111 per 100, 000 and ASMR— 74 per 100, 000)
- Prostate cancer age-standardised mortality increased from 2013 (55 per 100, 000) to 2014 (74 per 100, 000)
- Barbados has one of the lowest rates of lung cancer globally (7 per 100, 000), likely due to our low prevalence of tobacco smoking
- Breast cancer is the most common cancer in women and the second most common cancer overall (74 per 100, 000)
- Further data on staging and treatment is needed to explore factors contributing to low one-year (59%) and three year (48%) survival rates.




Years represented are 2014 for Barbados, 2008-2012 for other countries.

Cancer Incidence in Latin America and Caribbean (2008-2012). In: Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors
Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer. Available from: http://ci5.iarc.fr, accessed 05-June-2019.

# Background and Significance

Worldwide the burden of cancer is increasing as a result of several factors, including population growth and ageing as well as the changing prevalence of certain risk factors linked to social and economic development[4]. Changes are occurring as populations modify their diets, physical activity patterns, smoking habits and are exposed to environmental factors that may increase their risk of developing cancer. By collecting data that allows us to monitor incidence, mortality and survival trends, cancer surveillance tells us where we are in the effort to reduce the burden of cancer in our population. A registry can significantly impact health outcomes through observing and disseminating performance measures, identifying best practices and ultimately improving clinical practice[5]. The Barbados National Registry for Non-Communicable Diseases (BNR) began its retrospective cancer data collection in 2010 and has so far collected three full years (2008, 2013, 2014) of data on cancers.

# Objective

To collect timely and accurate national data on the occurrence of all malignant neoplasms as well as specific non-invasive tumours in order to contribute to the prevention, control and treatment of cancers in the Barbados population.

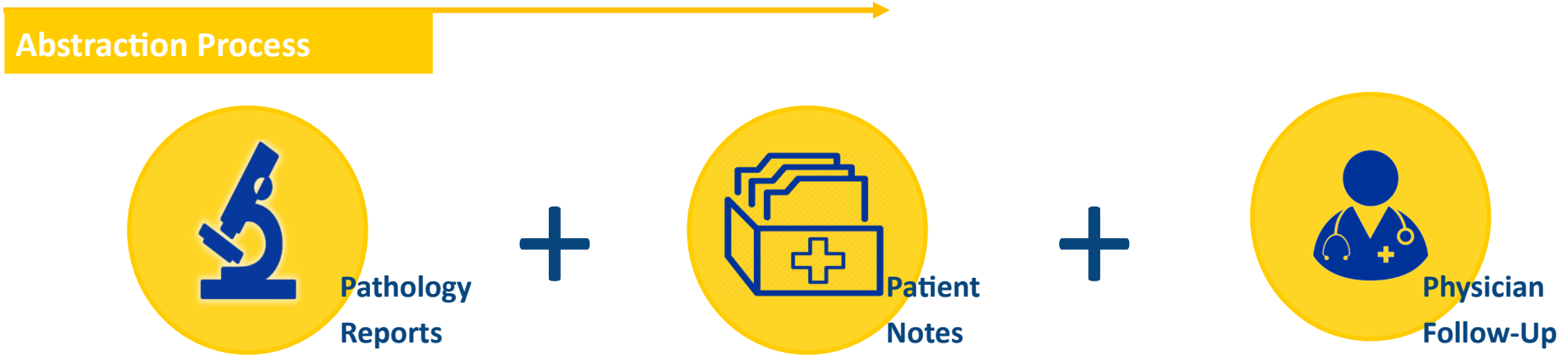

4. World Cancer Research Fund/American Institute for Cancer Research. Continuous Update Project Expert Report 2018. Diet, nutrition, physical activity and prostate cancer. Available at dietandcancerreport.org.
5. S Larsson et al. Of 13 Disease Registries In 5 Countries Demonstrates The Potential To Use Outcome Data To Improve Health Care's Value, Health Affairs 2012 31:1, 220-227

# Methods

Data collection for 2014 began in July 2017 and ended in May 2018. Given that one of the main objectives is the timely collection and reporting of data, the previous collection times of three years for 2008 and 2013 reports was undesirable. To achieve the one year data collection duration for 2014, we adopted the use of a strategy proposed by the International Agency for Research on Cancer (IARC) of a reportable minimum dataset[6], adding an expanded dataset (including staging and treatment data) in the quinquennial (5th) years. While this affords a reduction in time and the ability to report more frequently, there are several implications:

- Loss of comprehensive treatment data
- Lack of information on initial presentation and stage of disease

The strategy was accepted by the local Professional Advisory Board and the Ministry of Health and Wellness as an appropriate method to improve the timeliness needed to facilitate decision-making.




6. Cancer Incidence in Five Continents, Volume XI; Call for Data; Data Specification Submission Notes; June 2015. Available from: http://ci5.iarc.fr

# Data Collection Sources

Data were collected on all malignant neoplasms with a behaviour code of 3, according to the International Classification of Diseases for Oncology, 3rd Edition (ICD-O-3), as well as in situ neoplasms of the cervix only (CIN 3) diagnosed in 2014. Cases were ascertained by trained data abstractors via review of pathological and laboratory data, as well as data from key departments at the Queen Elizabeth Hospital: hematology clinic, the Clara Brathwaite Centre for Oncology & Nuclear Medicine, colposcopy and death records.

Following case ascertainment, data were abstracted directly onto encrypted laptops, using the International Agency for Research on Cancer (IARC)'s CanReg software, version 5. For complete information on each tumour, further retrieval from additional sources (e.g. private physicians and clinics) was performed as required. This is necessary as patients may take several pathways to diagnosis, whether accessing initial care through: the general practitioner, a non-governmental organisation (NGO) through breast or prostate screening programs, a specialist physician or a surgeon. By collecting data from all sources the most representative incidence date for the tumour can be determined (the first date of definitive diagnosis).

Mortality data was entered into a Microsoft Access database from paper records existing within the Barbados National Registration Department. This allowed the team to conduct death clearance and provides death clearance data to other departments within the Ministry of Health and Wellness.

# Data Analysis

In order to share data and have it be comparable to other countries and year-to-year, the BNR must maintain quality. We engage several tools for standardising and formatting variables, checking for accuracy, duplicates and missing data as well as performing preliminary analysis. Data Management and Analysis were performed using: IARCcrgTools version 2.12 (written by J. Ferlay, Section of Cancer Surveillance, International Agency for Research on Cancer, Lyon, France), Stata version 15.1 (StataCorp., College Station, TX, USA), CanReg5 database version 5.43 (International Agency for Research on Cancer, Lyon, France), the SEER Hematopoietic database (Surveillance, Epidemiology and End Results (SEER) Program [www.seer.cancer.gov] Hematopoietic and Lymphoid Database, Version 2.1 data released 05/23/2012. National Cancer Institute, DCCPS, Surveillance Research Program).

# Data Quality

Regarding data comparability and quality, IARC's Cancer Incidence in Five Continents (CI5), Vol. XI (electronic version)[4,5] notes: "The utility of the cancer registry is contingent on the underlying quality of its data and the quality control procedures it has in place." In the evaluation of registered cases, three dimensions of quality have been assessed to ensure that the registry submissions to this CI5 volume meet a sufficiently high standard for inclusion.

- *Comparability* is the extent to which a registry's coding and classification procedures and definitions adhere to established international standards and guidelines.
- *Completeness* is the degree to which all diagnosed neoplasms within a registry's catchment population are included in the registry database. The number of death certificate only (DCO) cases is often used to indicate possible cases missed.
- *Validity* (or accuracy) is the proportion of cases recorded as having a given characteristic that truly do have that attribute. Percentage of microscopic verification (MV%) is used to indicate validity— there are some sites where it is expected that the MV% will be high e.g. breast while sites such as pancreas and liver where biopsy is more difficult would be low.

**Table 2. A snapshot of the Percentage of cases at major sites by basis—death certificate only (DCO) and morphological verification (MV) that is, based on cytology or histology of primary or metastasis, Barbados, 2014**

| Cancer Site | Cases | MV% | DCO% | ICD-10 |
|---|---|---|---|---|
| Mouth & pharynx | 22 | 100.0 | 0.0 | C00-14 |
| Stomach | 16 | 81.3 | 18.8 | C16 |
| Colon, rectum, anus | 129 | 92.2 | 7.8 | C18-21 |
| Pancreas | 10 | 40.0 | 60.0 | C25 |
| Lung, trachea, bronchus | 27 | 81.5 | 18.5 | C33-34 |
| Breast | 158 | 95.6 | 4.4 | C50 |
| Cervix | 17 | 94.1 | 5.9 | C53 |
| Corpus & Uterus NOS | 36 | 97.2 | 2.8 | C54-55 |
| Prostate | 177 | 85.3 | 14.7 | C61 |
| Lymphoma | 38 | 76.3 | 23.7 | C81-85,90,88,96 |
| Leukaemia | 13 | 92.3 | 7.7 | C91-95 |
| All sites* | 732 | 89.5 | 10.5 | All |

**Table 3. Percentage of other an unspecified (O&U) and unknown age, all sites, Barbados, 2014 (N=927)**
**Comparison with registries in same geographic region, 2008-2012***

| Country | Male | | Female | |
|---|---|---|---|---|
| | O&U | Age Unk | O&U | Age Unk |
| Colombia, Cali | 4.6 | 0.5 | 5.4 | 0.7 |
| Costa Rica | 5.3 | 0 | 4.8 | 0 |
| France, Martinique | 1.5 | 0 | 2.2 | 0 |
| Jamaica, Kingston and St Andrew | 6.3 | 0.2 | 4.7 | 0.3 |
| USA, Puerto Rico | 2.1 | 0.1 | 2.4 | 0 |
| *Average for countries above* | *4.0* | *0.2* | *3.9* | *0.2* |
| Barbados | **2.5** | **0.2** | **2.4** | **0.1** |

7. Cancer Incidence in Latin America and Caribbean (2008-2012). In: Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors

8. Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer. Available from: http://ci5.iarc.fr, accessed 05-June-2019.

# Data Quality

These quality metrics as outlined in Tables 2, 3 and 4 are used internationally to assess the quality of a registry's data collection and reporting activities. Table 2 outlines the microscopically verified percentage (MV%) and the death certificate only (DCO cases). The MV% and the DCO% are typically compared to other countries within the region. When compared to Jamaica, Barbados' percentage of MV were similar, but the DCOs were higher.

Tables 3 shows the other and unknown/ unspecified sites (O&U), this is also used to assess the quality of data. This refers the number of cases which were coded to non-specific ICD-O-3 code, for example, C80.9—site unknown or C57.9 female genital organs, these case should be kept to a minimum. When compared to countries within the region, the BNR's percentage of O&U is relatively low.

Another measure of completeness is the number of sources per case. 2 sources per case is considered a minimum. This shows that a registry ascertained cases from a cross-section of sources, and therefore reducing the likelihood of missing cases. As seen in Table 4 Barbados has 2.75 sources per case.

**Table 4 – Review of Completeness – Number of Sources per Case, Barbados 2014 (total records n=2, 553)**

| Source | Total Records per Source | Percentage per Source |
|---|---|---|
| QEH | 1421 | 55.66 |
| Death Registry | 740 | 28.99 |
| Private Laboratory | 296 | 11.59 |
| Private Physician | 90 | 3.53 |
| Other | 4 | 0.16 |
| Unknown | 1 | 0.04 |
| Bay View | 1 | 0.04 |
| TOTAL sources | 2553 | |
| TOTAL cases | 927 | |
| **AVERAGE # sources per case** | **2.75** | |

# Incidence

The age-standardised incidence rate (ASIR) for all cancers in 2014 was 237 per 100,000. ASIRs were higher in men (266 per 100,000) relative to women (218 per 100,000). This is in keeping with global rates which are typically higher in men. Barbados' ASIRs equate more closely with the rates of developed countries with tend to be higher, for example, United Kingdom (295 per 100,00 in men and 263 per 100,000 in women versus Kuwait (95 per 100,000 in man and 131,0 per 100,000 in women).

In each year displayed (Table 6), prostate cancer accounted for the highest number of tumours - 204, 171 and 198 in 2008, 2013 and 2014 respectively. Breast cancer was consistently the second most common tumour and colon cancer the third most common. Unlike most other places in the world, lung cancer was not among the top five causes of cancer in Barbados. In keeping with the classification used by the International Agency for Cancer Registries, cancers of the colon and rectum have been separated in our presentation.

**Table 5. Number and percentage of the top five cancer sites[Δ] by sex, and age-standardised incidence rate per 100,000 population (ASIR) with 95% confidence intervals (95%CI), Barbados, 2014 (N=611)**

| Sex | Site | Number of tumours | % of all tumours | ASIR | 95% CI |
|---|---|---|---|---|---|
| **Both** | | **927** | **100.0** | **236.7** | **221.3–253.0** |
| **Women** | | **462** | **49.8** | **218.5** | **198.1–240.5** |
| | **Breast** | 155 | 33.6 | 74.5 | 62.9–87.8 |
| | **Colon** | 65 | 14.1 | 28.4 | 21.6–36.7 |
| | **Cervix Uteri** | 41 | 8.8 | 25.4 | 17.9–34.7 |
| | **Corpus Uteri** | 39 | 8.4 | 18.2 | 12.8–25.1 |
| | **Rectum** | 15 | 3.2 | 6.4 | 3.4–11.0 |
| **Men** | | **465** | **50.2** | **265.72** | **241.81 –291.44** |
| | **Prostate** | 198 | 42.6 | 111.5 | 96.4–128.5 |
| | **Colon** | 49 | 10.5 | 28.0 | 20.6–37.2 |
| | **Lung** | 19 | 4.1 | 10.4 | 6.2–16.6 |
| | **Multiple Myeloma** | 15 | 3.2 | 8.5 | 4.7–14.2 |
| | **Bladder** | 15 | 3.2 | 8.3 | 4.6–14.0 |

Δ Site groupings based on Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer. Available from: (chapter 3 Table 3.1): http://ci5.iarc.fr/CI5-XI/Pages/Chapter3.aspx

However, if the two sites were combined, numbers for colo-rectal cancer would surpass those of breast cancer in 2013. Combined the numbers for colo-rectal cancer are: N=144 (2014); N=161 (2013); N=126 (2008). Cervix uteri, which is predominantly infection-related, remains among the top 5 cancers in women.

9. Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors (2017) Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer. Available from: http://ci5.iarc.fr, accessed 2 July 2019

**Table 6. Number and percentage of the top 10 cancer sites[Δ], Barbados*, 2014 (N=680; 73% of all tumours), 2013 (N=604;71% of all tumours), 2008 (N=621;74% of all tumours*)**

| Site | Number of tumours | % of all tumours | ASIR | Number of tumours | % of all tumours | ASIR | Number of tumours | % of all tumours | ASIR |
|---|---|---|---|---|---|---|---|---|---|
| Year | | 2014 | | | 2013 | | | 2008 | |
| **All** | **927** | **100** | **236.7** | **845** | **100** | **219.6** | **838** | **100** | **214.6** |
| **CI** | | | **(221.3-253.0)** | | | **(204.7-235.4)** | | | **(199.8-230.2)** |
| ① **Prostate** | 198 | 21.4 | 111.5 (96.4-128.5) | ① 171 | 20.2 | 98.4 (84.1-114.5) | ① 204 | 24.3 | 113.2 (98.1-130.2) |
| ② **Breast** | 155 | 16.7 | 74.5 (62.9-87.8) | ② 134 | 15.9 | 64.9 (54.0-77.5) | ② 133 | 15.9 | 63.9 (53.1-76.3) |
| ③ **Colon** | 114 | 12.3 | 28.0 (23.0-33.9) | ③ 107 | 12.7 | 26.0 (21.2–31.7) | ③ 94 | 11.2 | 23.4 (18.8-28.8) |
| ④ **Cervix Uteri** | 41 | 4.4 | 25.4 (17.9-34.7) | ④ 44 | 5.2 | 23.3 (16.8–31.6 ) | ④ 53 | 6.3 | 32.0 (23.7-42.3) |
| ⑤ **Corpus Uteri** | 39 | 4.2 | 18.2 (12.8-25.1) | ⑥ 31 | 3.7 | 14.8 (10.0–21.2) | ⑤ 39 | 4.7 | 17.7 (12.5-24.6) |
| ⑥ **Lung** | 32 | 3.5 | 7.4 (5.0-10.6) | ⑦ 27 | 3.2 | 6.8 (4.5–10.1 ) | ⑦ 29 | 3.5 | 7.3 (4.8-10.6) |
| ⑦ **Rectum** | 28 | 3.0 | 6.9 (4.6-10.2) | ⑤ 44 | 5.2 | 10.9 (7.8–14.8) | ⑧ 29 | 3.5 | 7.3 (4.9–10.6) |
| ⑧ **Multiple Myeloma** | 28 | 3.0 | 6.9 (4.6-10.2) | ⑬ 13 | 1.5 | 3.3 (1.7–5.8 ) | ⑨ 17 | 2.0 | 3.8 (2.2–6.3) |
| ⑨ **Bladder** | 24 | 2.6 | 5.5 (3.5-8.4) | ⑯ 11 | 1.3 | 2.8 (1.4–5.1) | ⑰ 8 | 1.0 | 1.7 (0.7–3.6) |
| ⑩ **Pancreas** | 21 | 2.3 | 4.9 (3.0–7.7 ) | ⑩ 22 | 2.6 | 5.4 (3.4–8.4) | ⑩ 15 | 1.8 | 3.8 (2.1–6.5) |

*excluding other, unknown and in-situ tumours

Δsite groupings based on IARC CI5 Vol.XI classification (chapter 3 Table 3.1): http://ci5.iarc.fr/CI5-XI/Pages/Chapter3.aspx.

**Numbers for each diagnosis year may differ between reports depending on the data release version since additional cases can be found at a date later than the report release, this is a normal practice in registries internationally

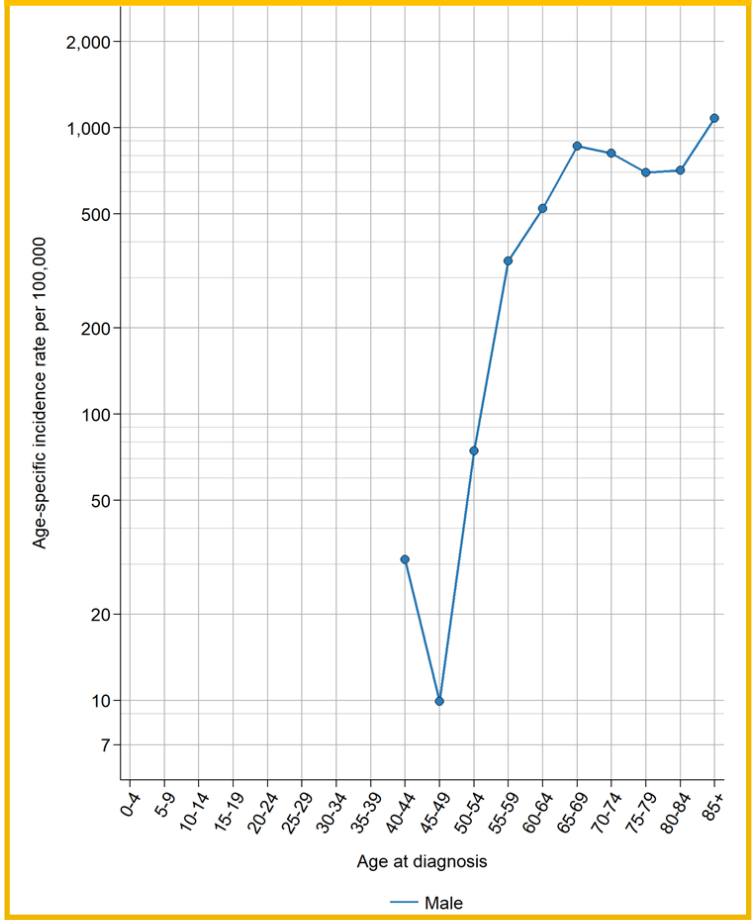
# Prostate Cancer

Our measured rate for prostate cancer in 2014 was 111 per 100, 000. These figures place us within the top five countries for high rates of prostate cancer after Martinique(165 per 100,000 ASRW), Lithuania (129 per 100,000 ASRW) and Australia (120 per 100,000)[9].

In Barbados, the highest age-specific rate is in the 85+ age group. Rates for men between 65 and 79 are consistently high.

We found a relatively high age-standardised mortality rate—74 per 100, 000. Globally there is a trend of decreasing mortality in developed counties and of increasing mortality in develop-ing countries.

**Table 7. Prostate Cancer Age-Specific Rates per 100, 000 for Barbados , 2014**



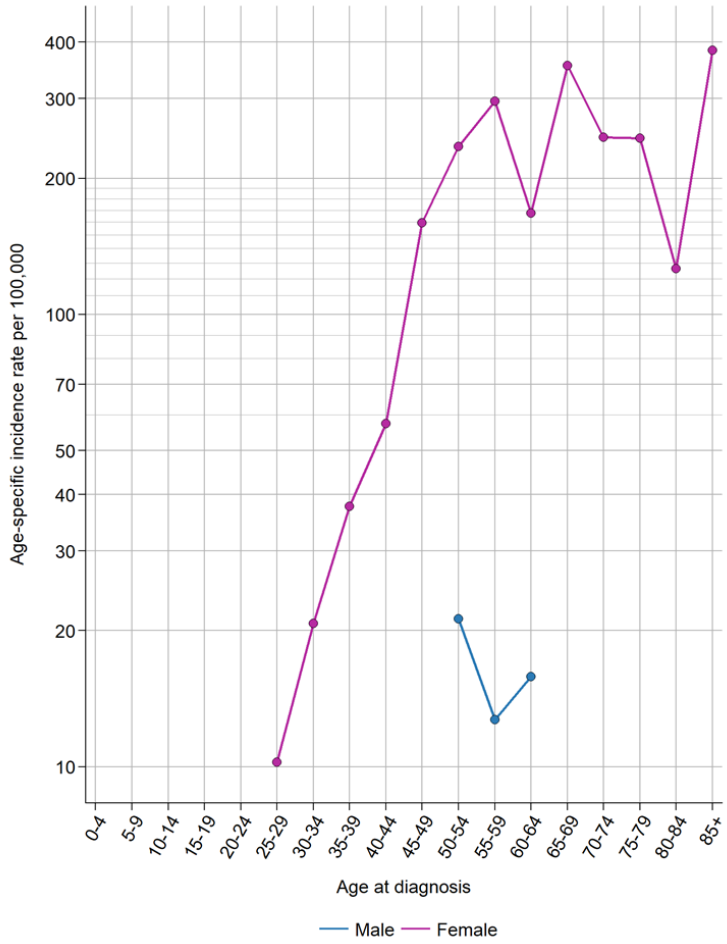

9. Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors (2017) Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer. Available from: http://ci5.iarc.fr, accessed 2 July 2019

# Breast cancer

As occurs worldwide, breast cancer is the most common cause of cancer in women in Barbados. In 2014, the BNR calculated a rate of 74 per 100, 000 for Barbados. Incidence rates globally range from 27 per 100,000 in Middle Africa to 92 per 100,000 in Northern America[2].

In Barbadian women, the highest age-specific rates are in the 85+ age group, second highest in women 65—69 years. Both family history and environmental factors are important contributors to its development.

**Table 8. Breast Cancer Age-Specific Rates per 100, 000 in Barbados, 2014**

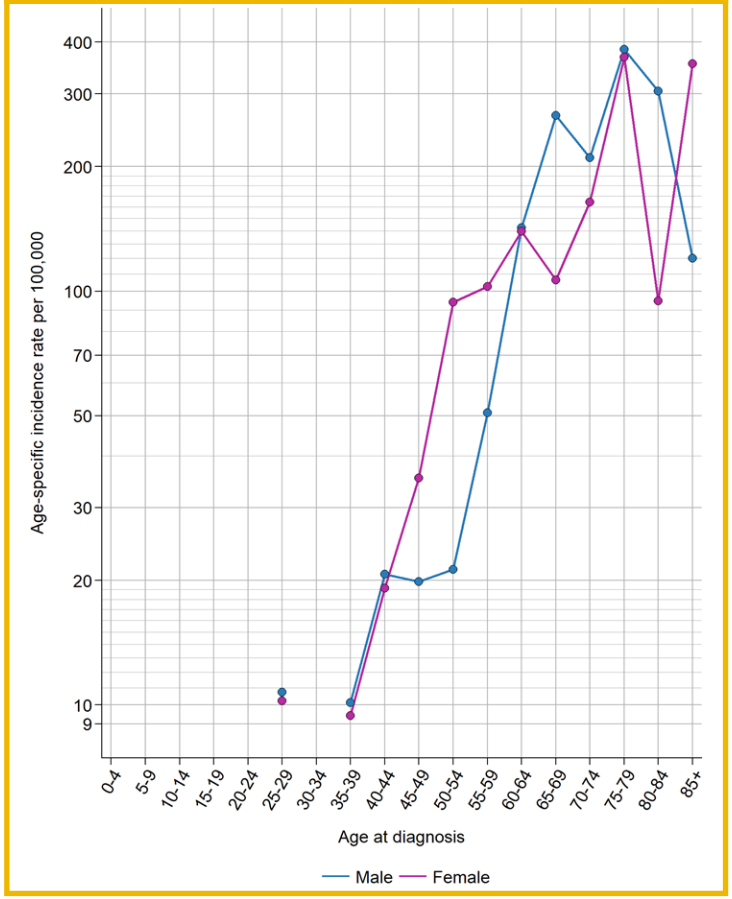



2. Max Roser and Hannah Ritchie (2019) - "Cancer". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/cancer'

# Colo-rectal Cancer

Colo-rectal cancer remains among the top five cancers and was the third most common cancer in 2008, 2013, and 2014. The peak age for colo-rectal cancers is in the 75—79 age group. The age standardised rate has remained mostly the same over that period.

**Table 9. Colo-rectal Age-Specific Rates per 100, 000 in Barbados, 2014**




# Lung Cancer

Table 5 shows that the age standardised incidence rates for lung cancer in Barbados has remained fairly stable around 6 per 100, 000. However this remains well below the global rates—where lung cancer is the most diagnosed and greatest cause of death, with the highest rates estimated in Hungary (57 per 100, 000)[2]. Mortality (Table 9) increased from 6 per 100, 000 in 2008 and 2013 to 10 per 100, 000 in 2014.

2. Max Roser and Hannah Ritchie (2019) - "Cancer". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/cancer'

# Mortality & Survival

Barbados' age-standardised mortality rate for all cancers was 149 per 100,000 which is similar to what was found in 2013 but significantly higher than the figure for 2008 (Table 10). Global Burden of Disease Collaborative Network's data indicates that the world mortality rate is 85 per 100, 000; age-standardised mortality rates range from 89 per 100, 000 to 151 per 100, 000 in developing countries to 79 per 100, 000 to 118 per 100, 000 in developed countries[2]. Demonstrating that while incidence rates continue to rise, mortality rates in developed countries are decreasing. There are some variances including China (79 per 100, 000) and Bermuda (64 per 100, 000).

In all three years reviewed, approximately half (476) of all tumours diagnosed resulted in death by 3 years post-diagnosis. This represents a relatively low survival rate. In the United Kingdom in 2010 – 2011, 60 % of persons diagnosed during this period were alive at 3 years.

**Table 10. Number and percentage of the top 10* cancer sites$^{\Delta}$ at death, Barbados, 2014 (N=464; 71% of all tumours), 2013 (N=413; 71% of all tumours), 2008 (N=351; 72% of all tumours)**

| Site | Number of tumours | % of all tumours | ASMR | Number of tumours | % of all tumours | ASMR | Number of tumours | % of all tumours | ASMR |
|---|---|---|---|---|---|---|---|---|---|
| Year | | 2014 | | | 2013 | | | 2008 | |
| **All** | **651** | **100** | **148.9** | **581** | **100** | **136.3** | **487** | **100** | **113.2** |
| **CI** | | | **(137.2–161.4)** | | | **(125.0–148.4)** | | | **(103.0–124.3)** |
| ① **Prostate** | 150 | 23.0 | 74.0 (62.5–87.3 ) | ① 108 | 18.6 | 54.6 (44.6–66.3) | ① 100 | 20.5 | 48.8 (39.6–59.7) |
| ② **Breast** | 72 | 11.1 | 17.7 (13.7–22.5) | ③ 59 | 10.2 | 14.9 (11.2–19.5) | ③ 50 | 10.3 | 13.0 (9.5–17.3) |
| ③ **Colon** | 71 | 10.9 | 16.3 (12.6–20.8) | ② 63 | 10.8 | 14.3 (10.9–18.6) | ② 60 | 12.3 | 14.4 (10.9–18.7) |
| ④ **Lung** | 41 | 6.3 | 10.2 (7.2–14.0) | ⑥ 27 | 4.7 | 6.2 (4.1–9.3) | ⑤ 27 | 5.5 | 6.4 (4.2–9.6) |
| ⑤ **Pancreas** | 29 | 4.5 | 6.9 (4.5–10.1) | ④ 34 | 5.9 | 8.1 (5.5–11.5) | ⑧ 18 | 3.7 | 4.4 (2.6–7.2) |

Prostate, breast and colon cancers were consistently rated within the top five causes of cancer deaths. There appears to be a gradual increase in age-standardised mortality rate for prostate over the three years reviewed while the rates of the remaining cancers experienced minor variations. In 2013, cervical cancer was fifth most common cancer death: ASMR 13.3 per 100,000 (95% CI 8.8-19.4 per 100,000). Stomach cancer was the fourth most common in 2008: ASMR 5.5 per 100,000 (95% CI 3.6-8.2 per 100,000).

2. Max Roser and Hannah Ritchie (2019) - "Cancer". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/cancer'

# Discussion

We have highlighted trends in incidence, mortality and survival in major cancers in Barbados in 2014. The age-standardised incidence rate for all cancers has seen a mild increase from 2008 to 2014. Deaths from cancer, shown as age-standardised mortality was noted to be higher in 2014 relative to 2008. Among the most common cancers, only prostate cancer showed a statistically significant increase in deaths as noted in the increase in ASMR from 48.8 per 100,000 (95% CI 39.6-59.7) to 74.0 per 100,000 (95% CI 62.5–87.3). Our relatively low survival rates at one and three years is a cause for concern and requires further collection on staging and treatment. For cancers diagnosed in 2018 BNR will undertake an expanded collection that will include information on staging and treatment.

There are several reasons why changes in rates may occur:

**Improved data collection techniques**

The registry began in 2010 by collecting data for 2008. Given the length of data collection for 2008 and 2013 (3 years each), the variables being collected were reduced which led to a more efficient process for 2014 data collection. We have also engaged in a more direct collaboration with the National Registration Department to obtain causes of death which may account for the increased proportion of cases captured from death certificates only.

**Better detection of the cancer through more screening**

The increased incidence in cancer may be due to increased numbers of men being screened for prostate cancer. Over the years of data collection a number of civil society organisations have increasingly encouraged and ran campaigns to increase screening among men especially in the latter months of the year.

**Real increases in the disease**

Our numbers may also be a reflection of real increases in the disease due to the fact that there are an increasing proportion of older men and women in Barbados and age increases one's risk for most types of cancer- prostate and breast cancer included.

# Key Challenges

1. For 2014 data collection, we collected core data only from our various data sources due to the resource constraints on the registry and the need to improve time from cancer occurrence to published data. This restricted the information available for analysis and restricted the comparisons that could have been made with previous years.
2. Our percentage of death certificate only cases increased from 2014 relative to 2013 from 5.1% to 7.7%. This was largely due to the high number of notes that were irretrievable from hospital and primary care offices for patients who were found to be cases based on their death certificates. This occurred despite our system of contacting both tertiary and primary care facilities where patients were treated.
3. Changes in management at key data collection sources resulted in the interruption of permission to collect and review notes.

# Objectives, 2019—2020

To improve timeliness through:

- Prospective case registration of 2019 cases
- Continued efforts to gain access to the health electronic medical record

# Public Awareness

## Presentations

Rose, A.M.C. "Quality of Life after Cardiovascular Events in Barbados". Presented at the Barbados Ministry of Health, February 3, 2017

Rose, A.M.C. "Cost of Cardiovascular Disease in Barbados". Presented at the Barbados Ministry of Health, February 3, 2017

Maul, L.R. "The Barbados National Registry for Chronic Non-Communicable Disease". Presented to students of The Barbados Community College Division of Health Sciences, Health Information Management Programme, March 27, 2017

Rose, A.M.C. "Economic burden of cardiovascular disease in a small island developing state". Presented at the 62nd Annual CARPHA Health research Conference, April 27, 2017, Guyana

Rose, A.M.C. "Quality of life after cardiovascular disease in a small island developing state". Presented at the 62nd Annual CARPHA Health research Conference, April 27, 2017, Guyana

## Continuing Medical Education

BNR Cancer Management Best Practices Seminar, Radisson Aquatic, November 9, 2017

Presentation - Forde, S "Preliminary Data on Cancer in Barbados – 2013".

## Media

Natalie Greaves' Front Page Feature – **Barbados Advocate**, "Progress being made of National Cancer Action Plan", presented at the BNR Cancer Management Best Practices Seminar

Natalie Greaves' Feature –**Nation Newspaper**, "Prostate No.1 Cause of Cancer Deaths", presented at the BNR Cancer Management Best Practices Seminar

# Local, Regional and International Collaborations

- Barbados Community College Health Information Management (HIM) Interns, August 8 – 18, 2017, annual 2 week internship program
- The BNR team has contributed to the development of the Caribbean Registry Manual: Data collection and Operating Procedures Module. This process was led by the IARC Caribbean Hub. http://caribbeancrh.carpha.org/Technical-Support/Standard-Operating-Procedures
- The Hub along with its partners; The Global Initiative for Cancer Registry Development (GICR), The Surveillance, Epidemiology and End Results Program (SEER) and the North American Association of Central Cancer Registries (NAACCR) conducted an evaluation of the registry during this period and was happy with the registry's progress.

**Engaging Local Doctors**

- Research Skills Practical –Stroke Scenario and Presentation on 'Good Documentation' by Dr Lynda Williams and BNR team, 82nd UWI-BAMP Conference

**Regional/International Conferences**

- 62nd Annual CARPHA Health Research Conference, April 27, 2017, Guyana – attended by Angela Rose
- African Caribbean Cancer Consortium (AC3) Scientific and Training Conference, March 24, 2017, Miami – attended by Shelly–Ann Forde, Senior Data Abstractor

# Appendices

## Appendix A—Acknowledgements

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Staff in the following departments of the Queen Elizabeth Hospital:

Medical Records

Pathology

Radiotherapy

Haematology

Death Records

Colposcopy

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# Appendices

## Appendix B—PAB Membership

***The Professional Advisory Board of the BNR (2012-2014)***

| *Name* | *Affiliation* |
|---|---|
| *Prof. Sir Trevor Hassell (Chair)* | *Chairman of the National Commission for Chronic NCDs* |
| *Dr Tomo Kanda* | *Specialist Advisor on NCDs, PAHO/WHO* |
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| *Mrs. Tanya Martelly* | *Registrar, BNR (2012–2015); Director, BNR* |

# Appendices

## Appendix C—Definitions

*An **incidence rate** is the number of new disease events occurring in a specified population during a year, usually expressed as the number of events per 100,000 population at risk. That is,*

***Incidence rate = (new events / population) × 100,000***

*The numerator of the incidence rate is the number of new disease events; the denominator is the size of the population. The number of new events may include multiple events occurring in one patient. In general, the incidence rate does not include recurrences (where recurrence is defined as a presentation to the healthcare system within a certain period of the initiating event).*

*The **age standardised rate** is the proportion of cases (or deaths) in a given population (and year) weighted by the age structure of the population. For incidence (ASIR) and mortality (ASMR) calculations, cases and deaths were weighted by the WHO World Standard population.*

*A mortality rate is the number of deaths, in which the disease (cancer) was the underlying cause of death, occurring in a specified population during a year. Mortality is usually expressed as the number of deaths due to the disease per 100,000 population. That is,*

***Mortality rate = (disease deaths/population) × 100,000***

*The numerator of the mortality rate is the number of deaths; the denominator is the size of the population.*

Cancer

Cancer is caused by both external factors (tobacco, chemicals, radiation, and infectious organisms) and internal factors (inherited mutations, hormones, immune conditions, and mutations that occur from metabolism), and its uncontrolled spread can lead to death. These causal factors may act together or in sequence to initiate or promote carcinogenesis (i.e. the development of cancer), which requires multiple steps that occur over many years. Cancer can be treated with any one or combination of the following: surgery, hormonal therapy, chemotherapy, immunotherapy, radiotherapy.

**Case definition for 2008 diagnoses:** "All in-situ and malignant neoplasms with a behaviour code of 2 or 3 according to the International Classification of Diseases for Oncology, 3rd Edition (ICD-O-3) as well as benign tumours of the brain & other parts of CNS, pituitary gland, craniopharyngeal duct and the pineal gland (behaviour code of 0 or 1)."

**Case definition for 2013 onwards diagnoses:** "All malignant neoplasms with a behaviour code of 3 according to the ICD-O-3 and in-situ neoplasms of the cervix only (CIN3). Exclude all other in-situ neoplasms and basal cell and squamous cell carcinoma of skin, non-genital areas".

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