THE UNIVERSITY OF THE WEST INDIES

Barbados National Registry

Cancer in Barbados 2015

The George Alleyne Chronic Disease Research Centre

CAIHR
CARIBBEAN INSTITUTE FOR HEALTH RESEARCH

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Executive Summary

What is in this report. The Barbados National Registry collects data on the total number of new cases and the number of deaths related to cancer each year by actively reviewing the pathology reports, patient notes and death records of persons for who cancer was listed as a cause of death. This report provides data on the burden of cancer in Barbados in 2015 and draws comparison between the collected data for 2013, 2014 and 2015.

Definition. Cancer is the uncontrolled overproduction of cells. It 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. 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).

Background. Cancer is a major public health concern in the Caribbean[1]. Cancer surveillance has an important role to play in cancer control and as a tool for focusing research[2,3]. The presence of a high-quality population-based registry in Barbados has led to the description of unique patterns in cancer incidence and mortality that can inform data driven screening and control programs. Describing the changes in burden over several years allows policy makers and researchers to determine the success of cancer control efforts.

Cancer in Barbados. In 2015, there were 1030 new cases of cancer reported in Barbados. This represents an age-standardised incidence rate (ASIR) of 231.5, that is, 232 cases of cancer were diagnosed for every 100,000 persons in Barbados.

The age-standardised incidence rate for men (238 per 100,000) remains higher than that for women (228 per 100,000), however, this difference has reduced from that of previous years (266 per 100,000 in men versus 218 per 100,000 in women in 2014), primarily due to an increase in the reported cases of breast cancer. Cervical cancer is no longer one of the top five cancers in Barbadian women due to a progressive decrease in incidence (36 per 100,000 in 2013 to 16 per 100,000 in 2014 and 2015). Prostate cancer remains the most prevalent cancer in men with an age-standardised incidence rate of 102 per 100, 000. Cancers of the gastrointestinal (GI) tract still represent many of the registered cases, these include colon (112), rectum (48) and stomach (36), the third, fourth and sixth most common cancers respectively.

Survival at 1-year and at 3-years (67% and 53% respectively), are in keeping with international statistics of 70% and 59% in the United Kingdom respectively[4].

Key Messages

- Many of the incidence rates of the top 10 cases have increased over the past 3 years
- The total number of cancer cases in women (544 cases) have overtaken the total number of cancer cases in men (486 cases) for the first time since the BNR has been reporting
- Reported cervical cancer cases have decreased over the past two years (2014, 2015) relative to 2013
- Prostate cancer remains the cancer of greatest concern in men (both age-standardised incidence and age standardised mortality are high - 103 and 42 per 100,000 respectively)

Summary Statistics

Table 1. Summary Statistics for BNR-Cancer, 2013-2015

Year	**2015**	**2014**	**2013**
No. of registrations (tumours)	1030	861	859
% of entire population	0.36	0.30	0.30
No. of registrations (patients)	1012	847	849
ASIR per 100,000	231.46	201.83	205.13
1-year survival (%)	66.8	63.3	66.2
3-year survival (%)	53.4	49.2	48.8
5-year survival (%)	47.1	41.9	43.0
No. registered by death certificate only (DCO)	96	40	43
% of tumours registered as DCO	9.3	4.7	5.0

*2015 (Population=285,327), 2014 (Population=284,825), 2013 (Population=284,294)

Introduction

Cancer continues to be one of the major causes of death in Barbados, with cancer of the prostate, breast and colon being listed as the third, seventh and ninth leading cause of death according to the latest Barbados Health Report[5]. Cancer surveillance, as conducted by the Barbados National Registry for Non-Communicable Diseases (BNR), provides us with the opportunity to track our progress in preventing this myriad of conditions and to monitor the success of the health care system in management and control. In this report, we present data on the number of new cases and number of deaths. New cases are presented as absolute numbers to reflect burden and, as age-standardised incidence rates, to allow us to monitor trends over years and compare with other countries. Similarly, we present the absolute number of deaths and age-standardised mortality rates, as well as data on 1-, 3- and 5–year survival.

Methods

BNR's methodology remained unchanged since our last report - 2014 (*See Appendix*). Data collection is largely based on paper-based records obtained from the pathology, clinical and death departments of the Queen Elizabeth Hospital as well as data from private pathology laboratories.

Cancer registries can take between two to five years after the end of a given calendar year to report complete data, due to the continuing accrual of late registrations, completion of trace-back and follow-up. In Barbados, an active data collection methodology is particularly impacted by paper-based systems and physician cooperation, increasing the time needed for these activities.

The Barbados National Registry continues to make every effort to ensure cancer data is comparable with other registries internationally, to allow researchers and public health officials to make appropriate assumptions. As such, we have outlined below the definitions and assumptions used for reporting and the changes made over time:

a. Switching from the International Agency for Research in Cancer (IARC) definition of incidence for 2008 data collection year to the European Network of Cancer Registries (ENCR) definition which better matched data we have collected for 2013 onward (see appendix for definitions)
b. Residency is categorised as:
    i. Persons living on the island for six months or more
    ii. As per the Barbados Statistical Services definition of 'usual residence' (*See Appendix*)
    iii. All persons registered with the Electoral and Boundaries Commission
    iv. The address listed on the death certificate

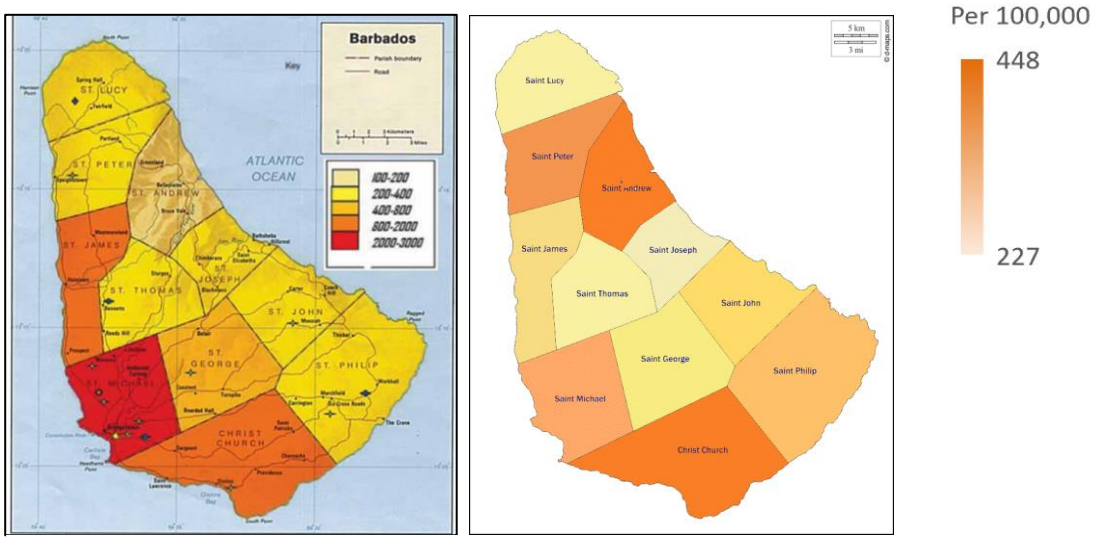
c. ASIRs report malignant tumours only. The summary tables include both malignant tumours and cervical carcinoma in situ. Notes accompanying the tables will guide readers accordingly.
d. Nationally reported annual numbers of cancer deaths presented by the Ministry of Health and Wellness may differ from numbers of deaths and age-standardised mortality rates (ASMRs) reported by the BNR. All cases of cancer listed on a cause-of-death are treated as a death certificate notification and are followed to determine the year of incidence.

Incidence

Geographic Distribution of Cancer in the Population

Figure 1 shows the distribution of cancer in Barbados per 100,00 population in comparison to a map of population density of Barbados. The lowest number of cases per 100,000 persons was found in St. Joseph, while the highest was seen in St. Andrew. This data is merely exploratory, no causal inferences should be drawn from this since these numbers have not been adjusted for basic confounders such as age and gender. Additionally, the small numbers of cases in these parishes likely makes year-on-year comparisons unreliable. As the registry grows and more years of data are available it will be possible to calculate moving averages and better estimate trends at the parish level.

Figure 1: Distribution of cancer cases per 100,000 in Barbados by Parish (BSS Pop 277,871), 2015



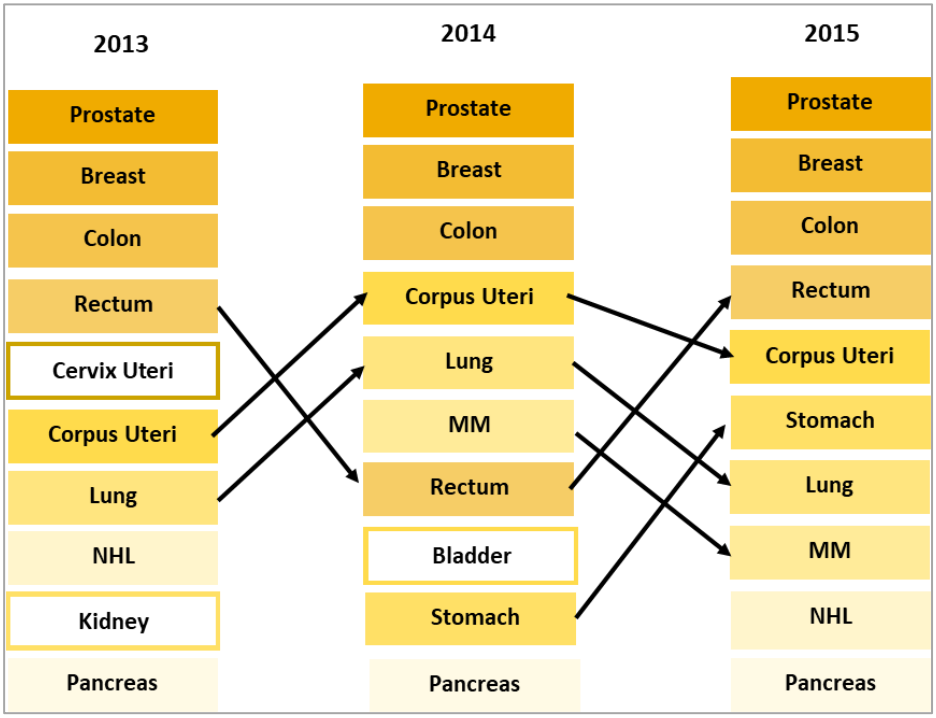
(Barbados population map as distributed in the Barbados CMOs report 2010 – 2012)

Parish	Cancer Cases	2010 Total Pop	Per 100,000
St. Andrew	23	5139	448
Christ Church	223	54,336	410
St Peter	45	11300	398
St. Michael	331	88529	374
St. Philip	109	30,662	355
St. John	31	8963	346
St. James	99	28498	347
St. George	69	19767	349
St. Lucy	33	9758	338
St. Thomas	45	14249	316
St. Joseph	15	6620	227

Number of Cases

The number of cases of cancer in Barbados has increased from 2014 to 2015; however, the cancers in the top 10 remain similar across the years under review (2013 – 2015). **Figure 2** shows the position changes in number of reported cases of cancer. Of note, prostate, breast, and colon cancer cases remain the largest contributors to the cancer burden accounting for over 50% of registered cases.

Figure 2. Position of the Top 10 cancers, 2013 - 2015



*NHL – Non-Hodgkin Lymphoma

*MM – Multiple Myeloma

In comparison to global rankings, lung cancer remains lower on Barbados' top ten list. In 2015 it was ranked seventh on our list as opposed to second on the global list[6], which might indicate the continued success in tobacco control efforts by the Government of Barbados.

Cancers of the gastrointestinal tract (GI), including cancers of the colon, rectum, and stomach, when grouped account for nineteen percent (19%) of all malignant cancer diagnoses. Pancreatic cancer, which typically has poor outcomes, represents 2.5% of cancers diagnosed in Barbados.

Table 2 shows the changes in the number of cases, the percentage of all tumours and the age-standardised incidence rates (ASIRs) for the top ten cancers between 2013 – 2015.

Table 2. Number and percentage of the top 10 cancer sites$^{\Delta}$, Barbados*, 2015 (N=773; 73% of all tumours), 2014 (N=637;71% of all tumours), 2013 (N=646;73% of all tumours*)

Site	Number of tumours	% of all tumours	ASIR (95% CI)	Number of tumours	% of all tumours	ASIR (95% CI)	Number of tumours	% of all tumours	ASIR (95% CI)
Year	**2015**			**2014**			**2013**		
All CI	**1030***	**100**	**231.5 (216.9-246.8)**	**861**	**100**	**201.8 (188.1-216.4)**	**859**	**100**	**205.1 (191.2-219.9)**
① **Prostate**	216	20.9	102.4 (89.0–117.4)	① 177	20.6	87.8 (75.2-102.1)	① 178	20.9	91.0 (78.0–105.7)
② **Breast**	197	19.0	89.5 (76.8 -104.0)	② 151	17.6	68.5 (57.6 – 81.0)	② 134	15.7	61.6 (51.1–73.7)
③ **Colon**	112	10.8	24.0 (19.6-29.1)	③ 104	12.1	23.7 (19.2–28.9)	③ 109	12.8	24.2 (19.8–29.5)
④ **Rectum**	48	4.6	11.1 (8.0-15.0)	⑦ 26	3.0	5.9 (3.8–8.9)	④ 44	5.2	10.1 (7.3–13.8)
⑤ **Corpus Uteri**	44	4.2	18.1 (13.1-24.7)	④ 37	4.3	15.8 (11.0–22.1)	⑥ 32	3.8	14.3 (9.7–20.4)
⑥ **Stomach**	36	3.5	6.6 (4.5-9.4)	⑩ 20	2.3	3.9 (2.3–6.3)	⑪ 17	2.0	3.97 (2.3–6.5)
⑦ **Lung (incl. trachea and bronchus)**	30	2.9	6.6 (4.4-9.7)	⑤ 33	3.8	6.7 (4.6–9.7)	⑦ 28	3.3	6.5 (4.3–9.5)
⑧ **Multiple Myeloma**	29	2.8	6.0 (4.0-8.9)	⑥ 30	3.5	6.9 (4.6–10.0)	⑬ 15	1.8	3.5 (1.9–5.9)
⑨ **Non-Hodgkin Lymphoma**	26	2.5	6.7 (4.3-10.0)	⑫ 16	1.9	3.9 (2.2–6.6)	⑧ 24	2.8	6.1 (3.8–9.4)
⑩ **Pancreas**	26	2.5	4.9 (3.2–7.5)	⑨ 20	2.3	4.1 (2.5–6.6)	⑩ 22	2.6	5.0 (3.1–7.8)

*ASIRs are calculated on malignant tumours only, therefore the total excludes non-malignant diagnoses – see case definition in Appendix.

*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

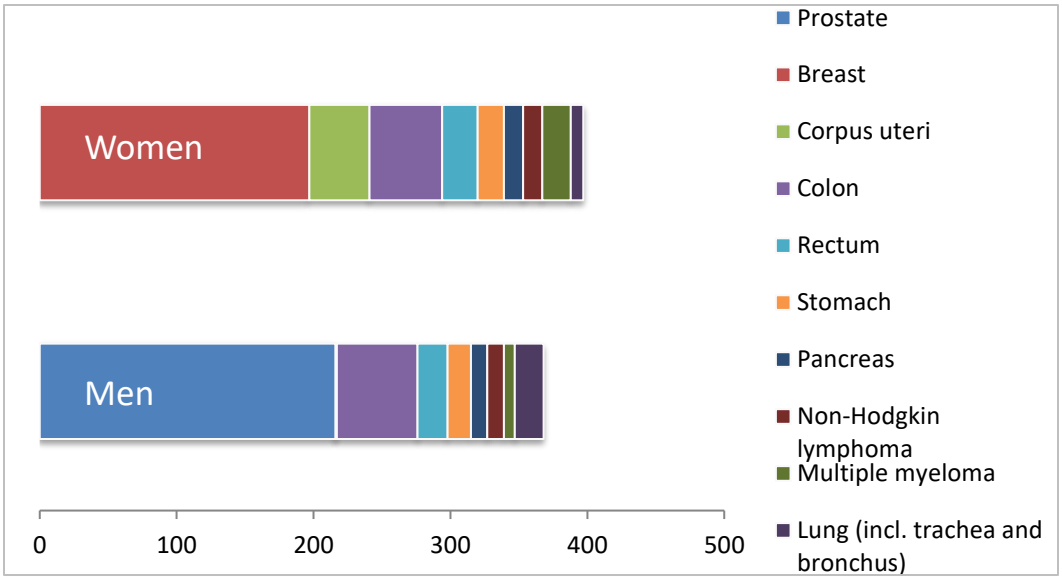
Cancer Distribution by Gender

A higher proportion of cancers occurred in women (53%) relative to men (47%). This is the first time in the years under review by the registry where this has occurred (Table 3). The increase follows a rise in the number of breast cancer cases (197 in 2015, versus 151 in 2014 and 134 in 2013). The top ten cancers are dominated by the primarily gender influenced types – prostate, breast, and corpus uteri (Figure 3). After prostate, colon and lung cancer cases are more common in men.

Table 3. Number and percentage of the top five cancer sitesΔ by gender, and ASIR with 95% confidence intervals (95%CI), Barbados, 2015, Women (147,779) Men (137,548)

Gender	Site	Number of tumours	% of all tumours	ASIR	95% CI
Both		**1030**	**100**	**231.5**	216.9 – 246.8
Women		**544**	**52.6**	**228.2**	208.1 – 249.8
	Breast	197	36.2	89.5	76.8 – 103.9
	Colon	53	9.7	22.0	16.3 - 29.3
	Corpus Uteri	44	8.1	18.1	13.1 - 24.7
	Rectum	26	4.8	10.3	6.4 - 15.8
	Multiple Myeloma	21	3.8	7.7	4.6 - 12.2
Men		**486**	**47.0**	**238.1**	217.0 – 261.1
	Prostate	216	44.1	102.4	89.0 – 117.4
	Colon	59	12.0	27.0	20.3 – 35.1
	Rectum	22	4.3	10.7	6.6 – 16.7
	Lung	21	4.3	10.7	6.6 - 16.7
	Stomach	17	3.5	7.7	4.4 - 12.7

Figure 3: Graphical Representation of Top 10 Cancer Cases by Gender, 2015



Age-standardised Incidence Rates (ASIR)

Figure 4 shows the age-standardised rates (ASIRs) 2013-2015. The figure shows that while the overall age standardised rates remain stable across the three years, cases of prostate cancer and breast cancer are rising irrespective of age.

Figure 4: Age-standardised Incidence Rate curves for top 5 cancers, 2013 – 2015

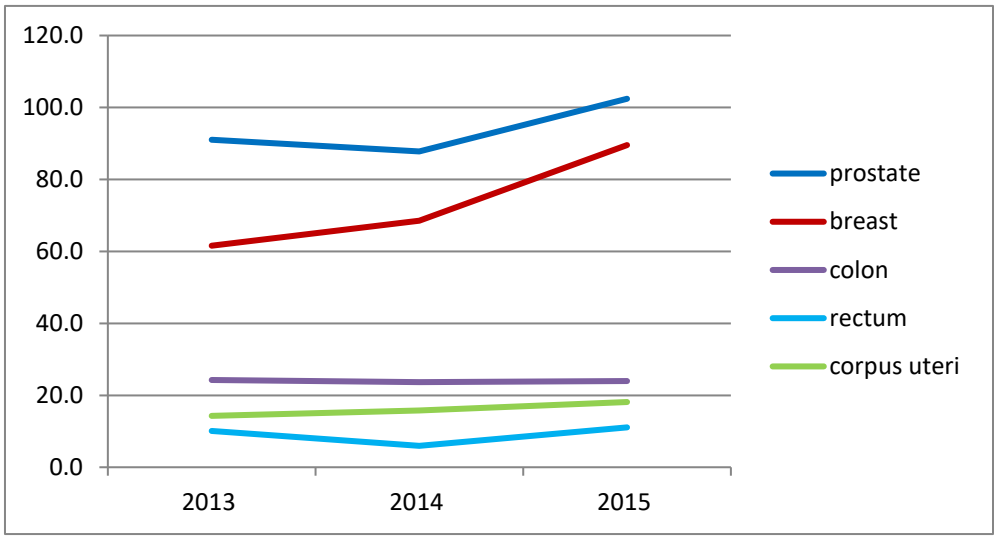
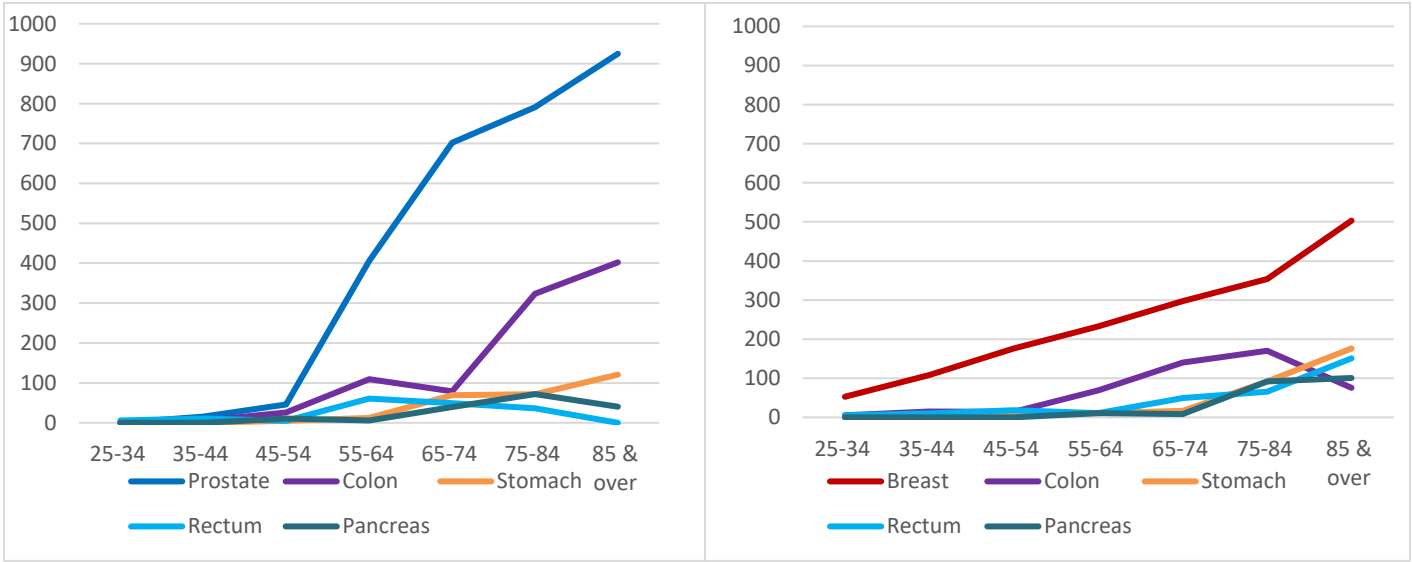


Figure 5 displays the age-specific rates by gender. Most of the cancers peak with age, demonstrating the increased risk with age. Rectal and pancreatic cancer in men and colon cancer in women peak at a younger age.

Figure 5: Age-Specific Rates for Top 5 cancers by Gender, for persons over age 25 years, 2015



Mortality

Age-standardised Mortality Rates (ASMR)

The age-standardised mortality rates decreased in 2015 (126 per 100,000) relative to 2014 (149 per 100, 000) (**Table 4**). A large part of this decrease was due to a reduction in the mortality rates for prostate cancer from 74 to 42 per 100,000 (**Figure 6**). While this decrease is good, these rates remain double to triple the observed rates in Latin American countries in 2015.[7]

Colon cancer replaced breast cancer as the second leading cause of death from cancer in terms of cases, however as seen in ASMRs, breast remains slightly higher.

Figure 6: Age-standardised Mortality Rate curves for top 5 cancers, 2013 – 2015

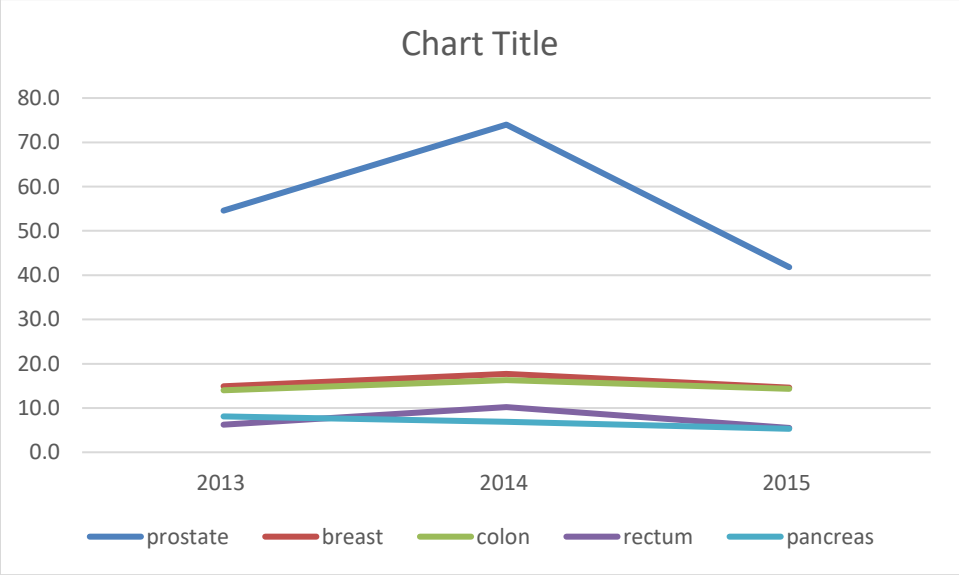


Table 4. Number and percentage of the top 5* cancer sites^Δ^ at death, Barbados, 2015 (N=631; 61% of all tumours), 2014 (N=464; 71% of all tumours), 2013 (N=413; 71% of all tumours)

Year	2015			2014			2013		
	Number of tumours	% of all tumours	ASMR (95%CI)	Number of tumours	% of all tumours	ASMR (95%CI)	Number of tumours	% of all tumours	ASMR (95%CI)
All	**631**	**100**	**143.7 (132.3–156.0)**	**651**	**100**	**234.3 (216.7–253.0)**	**581**	**100**	**241.3 222.1–261.8**
① Prostate	104	16.5	51.1 (41.6 – 62.3)	① 150	23.0	74.0 (62.5–87.3)	① 108	18.6	① 54.6 (44.6–66.3)
② Colon	75	11.9	16.8 (13.1-21.4)	③ 72	11.1	17.7 (13.7–22.5)	③ 59	10.2	③ 14.9 (11.2–19.5)
③ Breast	64	10.1	15.2 (11.5-19.7)	② 71	10.9	16.3 (12.6–20.8)	② 63	10.8	② 14.3 (10.9–18.6)
④ Stomach	31	4.9	6.4 (4.2-9.6)	⑨ 41	6.3	10.2 (7.2–14.0)	⑥ 27	4.7	⑥ 6.2 (4.1–9.3)
⑤ Pancreas	29	4.6	6.1 (4.0-9.0)	⑤ 29	4.5	6.9 (4.5–10.1)	④ 34	5.9	④ 8.1 (5.5–11.5)
⑥ Lung	28	4.44	6.90 (4.5-10.1)	④ 22	3.4	5.3 (3.3–8.2)	⑧ 17	2.9	⑧ 4.3 (2.5–7.0)
⑦ Multiple Mye-loma	27	4.28	6.48 (4.2-9.6)	⑥ 21	3.2	9.4 (5.7–14.8)	⑫ 14	2.4	⑫ 5.9 (3.2–10.4)
⑧ Corpus Uteri	24	3.8	10.38 (6.5-15.9)	⑦ 20	3.1	4.8 (2.9–7.7)	⑦ 25	4.3	⑦ 5.5 (3.5–8.4)
⑨ Rectum	23	3.65	5.84 (3.6-9.0)	⑧ 20	3.1	4.0 (2.4–6.5)	⑨ 17	2.9	⑨ 3.8 (2.2–6.3)
⑩ Non-Hodgkin Lymphoma	17	2.69	4.43 (2.5-7.3)	⑩ 18	2.8	4.6 (2.6–7.5)	⑩ 16	2.8	⑩ 4.4 (2.4–7.3)

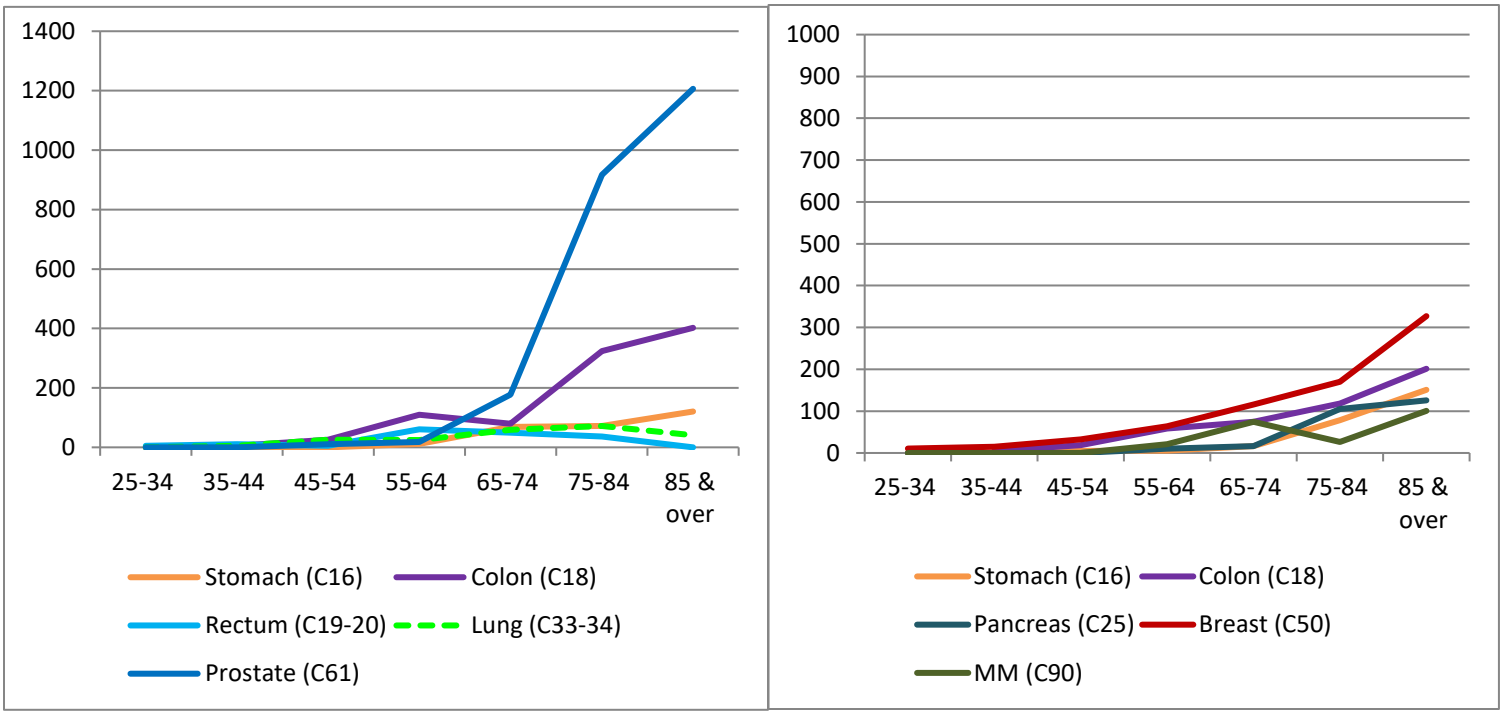
Age-specific Mortality rates

The age-specific mortality rates follow a very similar trend to the incidence of cancer. While there was a decrease in deaths attributed to prostate cancer, it remains the most common cause of cancer deaths among men in Barbados. A sharp increase after age 45 is noted in prostate deaths, while breast cancer deaths gradually increase with age.

The age-specific mortality rates for men are shown in the figure below. The risk of colon and prostate cancer deaths shows an increase in men after age 65.

Colon cancer is the second leading cause of death in both men and women as seen in Figure 7. However, multiple myeloma and pancreatic cancer are of concern in the 65- 74 and 75- 84 age groups respectively in women.

Figure 7: Age-Specific Mortality Rates by Gender, for persons over age 25 years, 2015



*MM – Multiple Myeloma

Mortality to Incidence Ratios (M:I ratios or MIR)

Mortality-to-incidence (M: I) ratios can be used as an indicator of the quality of cancer management systems and can demonstrate where cancer programs can benefit from increased screening and early detection efforts[8]. The M:I ratios were calculated for 2015 BNR data by comparing the incidence and mortality in the same year. The high M:I ratios for prostate and colo-rectal cancers relative to developed countries indicates a greater need for investment in screening. The relatively high M:I ratios for pancreatic cancer indicate its lethality and lack of effective screening for this type of cancer.

Table 5: Mortality to Incidence Ratios for the top ten cancer

Rank	Site	Incidence	Mortality	M:I ratio	M:I ratios+
	ALL	1030	631	0.61	0.07-0.56
1	Prostate	216	104	0.48	0.12-0.34
2	Breast	197	64	0.32	0.23-0.60
3	Colo-rectal	163	98	0.60	0.23-0.60
5	Corpus uteri*	51	33	0.65	0.31-0.86
6	Stomach	36	31	0.88	0.68-0.97
7	Lung (incl. trachea and bronchus)	30	28	0.93	0.71-0.86
8	Multiple myeloma	28	27	0.96	0.09-0.64
9	Non-Hodgkin Lymphoma	27	17	0.63	
10	Pancreas	26	29	1.11**	

+These ranges are from MI ratios calculated for 34 countries of the Organization for Economic Cooperation and Development (OECD)

*For the purpose of M:I Ratio 'Corpus Uteri' includes Uterus NOS, (C54-55)

**MI ratios over 1 are considered "unreliable"

Data Quality

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. Another measure of completeness is the number of sources per case. Two 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. The Barbados National Registry demonstrates a high level of completeness, with 1.98 sources per case.

Table 6. Review of Completeness – Number of Sources per Case, Barbados 2014 and 2015 (total records n=2, 553)

	2015			2014	
Source	**Total Records per Source**	**Percentage per Source**	**Source**	**Total Records per Source**	**Percentage per Source**
QEH	1271	60.27	**QEH**	1421	55.66
Death Registry	392	18.59	**Death Registry**	740	28.99
Private Laboratory	400	18.97	**Private Laboratory**	296	11.59
Private Physician	44	2.09	**Private Physician**	90	3.53
Other	1	0.05	**Other**	4	0.16
Unknown	1	0.05	**Unknown**	1	0.04
Bay View	0	0	**Bay View**	1	0.04
TOTAL sources	2108		**TOTAL sources**		2553
***TOTAL cases**	1066		***TOTAL cases**		927
AVERAGE # sources per case		1.98	**AVERAGE # sources per case**		2.75

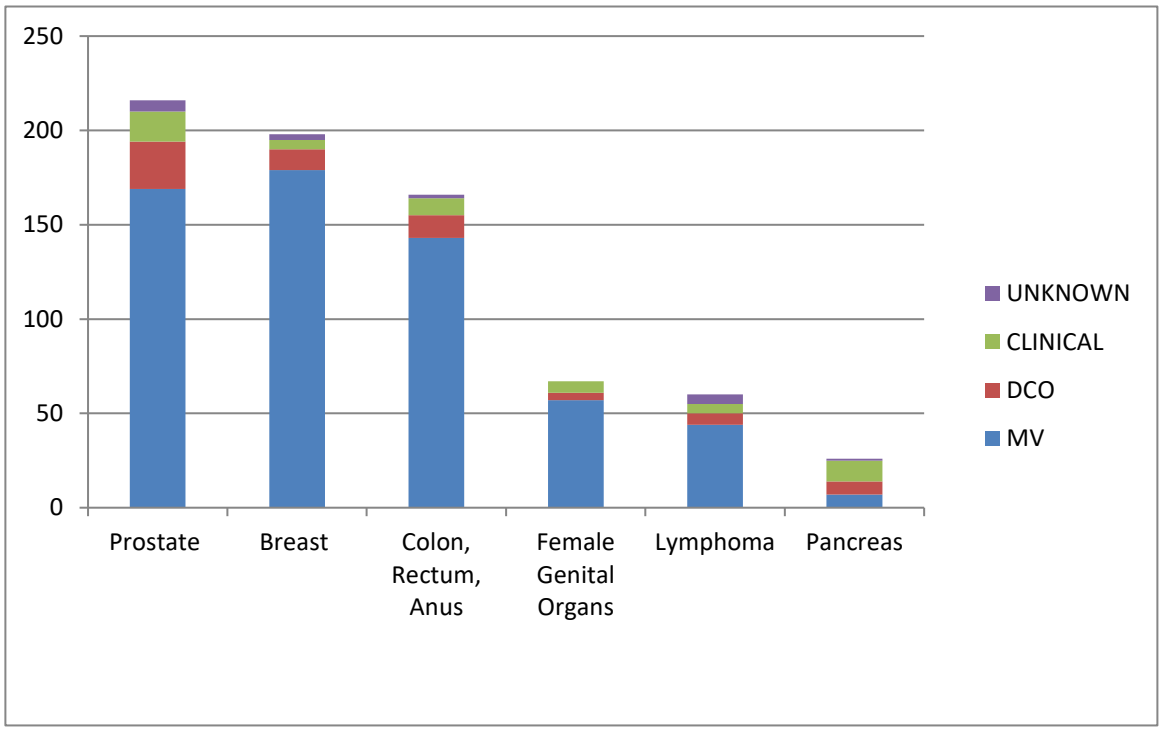
*These totals represent all potential cases before duplicates are dropped

Death Certification Only (DCO) Cases

We registered 9.3% of cases from information provided on death certificates only (DCO). **Table 6** shows the difference in the completeness between 2014 and 2015. The reduction in numbers from multiple sources is indicative of the challenge of accessing data from some sources due to COVID and infrastructure challenges at our main source (construction in departments at the Queen Elizabeth Hospital). Registering cases with death certificate only is less than ideal and contributes to misclassification of cases.

The below figure (Figure 9) looks at the diagnosis method of certain cancers in Barbados. 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. Most registries aim to keep cases registered clinically and via death certificate only low.

Figure 8: Diagnostic Methods of Certain Cancers Barbados, 2015



DCO – Death Certificate Only
MV – Microscopic Verification

*The DCOs number for prostate cancer include a portion of cases which cannot be verified because of non-cooperation from primary care physicians.

BNR Professional and Public Engagement

The below are some of the professional and public engagement activities which the BNR hosted in 2020.

Continued Medical Education

Media

Dr Sobers featured for World Cancer Day, Nation Newspaper, February 4, 2020

Article written on BNR's World Cancer Day Message "Easier Access to Cancer Patient's Data Critical" and posted to GIS Barbados https://gisbarbados.gov.bb/blog/easier-access-to-cancer-patients-data-critical/

Article written based in BNR's World Cancer Day message "Registry: Need for secure access to records of cancer patients" https://www.nationnews.com/2021/02/04/registry-need-secure-access-records-cancer-patients/

Local, Regional and International Collaborations

- The Barbados National Registry joined the NAACCR CS-CR Global Working group to develop a strategy for the creation of a training manual and schedule of training for cancer registration in the Caribbean

Engaging Local Doctors

Co-presentation at BAMP webinar – "Death Certification" by Dr A Grandison and Dr I Bascombe, Research Assistant, BNR – November 22, 2020

Regional/International Trainings

- BNR's Cancer team received scholarships to participate in the April Fritz Memorial Fund NCRA Annual Educational Virtual Conference
- BNR's Cancer team received funding from the IARC Caribbean Hub to participate in the NAACCR webinars

Appendices

Appendix A – Acknowledgements

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Ms K Greene, Steno Clerk

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Prof. Sir Trevor Hassell, Chairman of National Chronic Non-Communicable Disease Commission

Staff in the following departments of the Queen Elizabeth Hospital: Medical Records, Pathology, Radiotherapy, Haematology, Death Records, Colposcopy

Special thanks also to the private laboratories, physicians, and surgeons as well as The Barbados Cancer Society Breast Screening Programme who faithfully notify.

Appendix B – PAB Membership

The Professional Advisory Board of the BNR (2015)

Name	Affiliation
Prof. Sir Trevor Hassell (Chair)	Chair, National Commission for Chronic Non-Communicable Diseases
Dr Tomo Kanda	Specialist Advisor on NCDs, PAHO/WHO
Dr Joy St. John	Chief Medical Officer, MHW
Dr Kenneth George	Senior Medical Officer of Health, MHW
Dr Dexter James	CEO of the QEH
Dr Richard Ishmael	Consultant cardiologist, QEH
Dr R K Shenoy	Consultant radiotherapist, QEH
Prof. David Corbin	Consultant Neurologist, QEH, Clinical Director, BNR–Stroke
Dr Rudolph Delice	Head of Department of Medicine, QEH; Clinical Director, BNR–Heart
Prof. Patsy Prussia	Honorary Consultant Pathologist, QEH; Clinical Director, BNR–Cancer
Prof. Clive Landis Director,	CDRC
Dr Angela Rose	Head of NCD Surveillance, CDRC
Mrs. Tanya Martelly	Director, BNR

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 Definitions

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".

The case definition for 2014 onwards remains the same as 2013 but was reworded to: 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.

Residency

'Usual Residence' used in the Population and Housing Census is as follows:

Usual Residence – This is defined as the place where a person being enumerated lives and sleeps most of the time.

(a) For persons with more than one home, usual residence will be the one at which the person spends the greater part of the year. Thus, for an individual who has more than one place of residence because his workplace or school is away from home, the usual residence should be that place in which he/she spends at least four nights of the week.

(b) Fishermen at sea are considered to have their place of usual residence where they dwell when on shore.

(c) Barbadians in the farm labour programme were enumerated in their usual households; seamen or crewmembers on vessels plying foreign ports should record as their usual residence the place where they stay when on shore.

(d) Aircraft pilots are considered to have their usual residence in the households in which they dwell.

(e) Foreign diplomats are the usual residents of the countries they represent and were not enumerated.

Appendix D – Data Quality

Data Collection Methodology

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 make it 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 the International Association for Research in Cancer software: IARCcrgTools version 2.12 (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).

References

1. Dingle Spence, FRCR, Rachel Dyer, MBChB, Glennis Andall-Brereton, PhD, Prof Michael Barton, MBBS, Susannah Stanway, MD, M Austin Argentieri, MPhil et al. Cancer control in the Caribbean Island countries and territories: some progress but the journey continues. Published: August 05,2019 doi: https://doi.org/10.1016/S1470-2045(19)30512-1

2. Glaser, S.L., Clarke, C.A., Gomez, S.L. et al. Cancer Surveillance Research: a Vital Subdiscipline of Cancer Epidemiology. Cancer Causes Control 16, 1009–1019 (2005). https://doi.org/10.1007/s10552-005-4501-2

3. Emerging Roles for Cancer Registries in Cancer Control PETER GREENWALD, M.D., Dr.P.H., EDWARD J. SONDIK, Ph.D., AND JOHN L. YOUNG, Jr., Dr.P.H. National Cancer Institute, Bethesda, Maryland Received March 4, 1986

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

5. The Ministry of Health and Wellness. Barbados Health Report 2019. https://www.barbadosparliament.com/uploads/sittings/attachments/0c85813fd4d9746f1558af6c13239fca.pdf

6. Global Burden of Disease Cancer Collaboration, Fitzmaurice C, Allen C, et al. Global, Regional, and National Cancer Incidence, Mortality, Years of Life Lost, Years Lived with Disability, and Disability-Adjusted Life-years for 32 Cancer Groups, 1990 to 2015: A Systematic Analysis for the Global Burden of Disease Study [published correction appears in JAMA Oncol. 2017 Mar 1;3(3):418]. JAMA Oncol. 2017;3(4):524-548. doi:10.1001/jamaoncol.2016.5688

7. Carioli, G., Bertuccio, P., Malvezzi, M., Rodriguez, T., Levi, F., Boffetta, P., La Vecchia, C. and Negri, E. (2020), Cancer mortality predictions for 2019 in Latin America. Int. J. Cancer, 147: 619-632. https://doi.org/10.1002/ijc.32749

8. Choi E, Lee S, Nhung BC, et al. Cancer mortality-to-incidence ratio as an indicator of cancer management outcomes in Organization for Economic Cooperation and Development countries. Epidemiol Health. 2017;39:e2017006. Published 2017 Feb 5. doi:10.4178/epih.e2017006

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