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Barbados National Registry

MINISTRY OF HEALTH AND WELLNESS
BARBADOS

CANCER IN BARBADOS

REPORT 2022

The George Alleyne Chronic Disease Research Centre

CAIHR
CARIBBEAN INSTITUTE FOR HEALTH RESEARCH

Contents

List of Figures

List of Tables

Executive Summary

What is in this report. This report represents the first time the Barbados National Registry has reported more than five consecutive years of national incidence data (2013–2018), as well as the most recent mortality data on cancer (2013–2021). In addition, the report includes prostate and colorectal cancer staging for 2018.

Definition. Cancer is the uncontrolled overproduction of cells. It is caused by both external factors (e.g., tobacco, chemicals, radiation, and infectious organisms) and internal factors (e.g., inherited mutations, hormones, immune conditions, and mutations that occur from metabolism), and its uncontrolled spread can lead to death. These factors act in complex mechanisms 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. The registration criterion for the BNR is defined as all neoplasms with a behaviour code of 3 (malignant), according to the International Classification of Diseases for Oncology, 3rd Edition 1st Revision (ICD-O-3.1), as well as in situ (behaviour code of 2) neoplasms of the cervix only (CIN III).

Background. Cancer continues to be a major contributor to NCD-related deaths in Barbados[1] and approximately 25% of annual deaths are cancer related. The availability of high-quality cancer data for multiple years allows for the review of trends and the evaluation of the success of efforts at cancer control. Studies suggest that cancer cases and related social disparities in the Caribbean and Latin America are expected to increase. Cancer surveillance data can focus the resource allocations of policymakers to targeted areas of improvement across the care continuum, reducing these disparities and related cancer deaths.

Cancer in Barbados. There has been an increase in the number of cancer cases (Table 1) while the age-standardised incidence rate has remained stable for the period 2013 to 2018. This increasing number of cases, with stable age-standardised rates suggests that the increase noted is likely due to Barbados' aging population. Age-standardised incidence rate figures in 2018 were similar to 2013 (209.6 per 100,000 in 2018, versus 209.5 per 100,000 in 2013).

Cancer distribution by gender revealed more cases in men than women. Age-standardised incidence in men (218.2 per 100,000) was higher than women (205.1 per 100,000) in 2018. Prostate, breast, and colon cancer remained the leading cancers diagnosed, as well as the leading causes of cancer-related deaths 2015-2018. Absolute numbers of pancreas cancer cases have increased, while the age-standardised incidence rate has remained stable. This is of concern as it increases the burden of care for both morbidity and mortality due to the poor prognosis of pancreatic cancer. Lung cancer cases remained low, ranking eighth (8th) in Barbados as compared to third (3rd) globally. Cervical cancer also remained low in 2018, which may be evidence of the success of control measures and the treatment of

[1] The Ministry of Health and Wellness. Barbados Health Report 2019. https://www.barbadosparliament.com/uploads/sittings/attachments/0c85813fd4d9746f1558af6c13239fca.pdf. Accessed November 2021

pre-cancerous lesions (CIN III). For all cancers, 1-year survival ranged from 63% to 69% in the period 2013-2018 and 3-year survival moved from 49% in 2013 to 56% in 2018.

Key Messages

- There was an increase in the absolute numbers of pancreatic cancer cases in 2018, which is concerning due to poor patient outcomes and the burden of morbidity and mortality.

- Prostate cancer incidence has decreased between 2016-2018. However, when compared to international estimates, Barbados remains at number 5 and 2 in incidence and mortality respectively according to the World Cancer Research Fund[2], and number 1 in mortality by The International Agency for Research on Cancer (IARC)[3].

- Breast cancer age-standardised mortality rates (ASMRs) are trending upward after reductions during the period 2015 -2017, this is counter to global trends of decreasing mortality.

- The fall in cervical cancer incidence and mortality: incidence ratios may be an indication of improved uptake of cervical cancer screening and control measures.

- Cancer mortality for the top five cancers all show increasing mortality between 2020 and 2021, this trend warrants research.

Summary Statistics

Table 1: Summary Statistics for BNR-Cancer, 2013-2018

Year	2018	2017	2016	2015	2014	2013
No. registrations (tumours)	960	977	1070	1092	884	884
No. registrations (patients)	934	959	1034	1070	865	868
% of entire population	0.33	0.34	0.36	0.38	0.30	0.31
Age-standardized Incidence Rate (ASIR) per 100,000	209.6	208.6	233.0	243.9	206.2	209.5
No. registered by death certificate only (percentage of DCO patients registered)	55 (5.7%)	79 (8.1%)	82 (7.7%)	101 (9.3%)	41 (4.7%)	59 (6.6%)
1-year survival (%)	69.0	64.7	63.0	66.6	64.1	66.0
3-year survival (%)	55.8	50.0	49.5	51.6	48.9	49.2
5-year survival (%)	.	.	43.8	44.1	40.7	42.9

Note 1: 2018 (Population=286,640), 2017 (Population=286,229), 2016 (Population=285,798), 2015 (Population=285,327), 2014 (Population=284,825), 2013 (Population=284,294)

[2] World Cancer Research Fund. https://www.wcrf.org/cancer-trends/ . Accessed on September 1, 2022.

[3] Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R.L., Torre, L.A. and Jemal, A. (2018), Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer Journal for Clinicians, 68: 394-424. https://doi.org/10.3322/caac.21492

Introduction

The Caribbean region, largely comprised of small island developing states, has been quantitatively underrepresented in reports designed to quantify cancer burden. This report by the Barbados National Registry presents population-based cancer incidence (2013–2018) and mortality data (2013–2021). Multiple milestones have been accomplished since the publication of our 2015 annual report, including submission to the Cancer in Five Continents (CI5) publication call for data, which is considered the gold standard for cancer registry data. In addition, staging was performed on prostate and colorectal cancer cases, this is significant because there is limited staging data produced regionally.

Methods

BNR's methodology remained unchanged since our last report - 2015 (*See Appendix*). Data is collected from paper-based records obtained from the pathology, clinical and death departments of the Queen Elizabeth Hospital (QEH) 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, thus 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, as such, we have outlined below the definitions and assumptions used for reporting and the changes made over time:

a. The Registry switched from The International Agency for Research on Cancer (IARC) definition of incidence, for 2008 data collection year, to the European Network of Cancer Registries (ENCR) definition which better matched data we had 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. 'Usual residence' as per the Barbados Statistical Services definition (*See Appendix*)
    iii. All persons registered with the Electoral and Boundaries Commission
    iv. The address listed on the death certificate if no other information available
c. Only malignant tumours are for ASIRs are included in this report, per international standards. 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. MHW reports based on underlying cause of death and BNR reports all cases with cancer listed on the death certificate. All cases with cancer listed as a cause-of-death are treated as a death certificate notification and are investigated to determine the year of incidence.

Incidence

Number of Cases

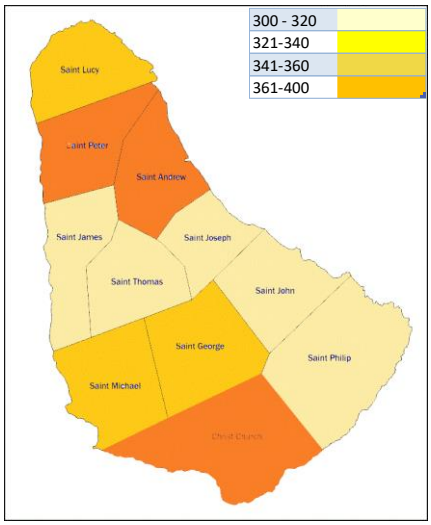
The top ten cancers in Barbados account for over seventy percent (70%) of cancer cases annually, while cancer deaths constitute 25% of annual deaths in Barbados. The top ten cancers remained quite similar over the six-year period, with prostate, breast, colon persisting in the top three ranking, with corpus uteri most often in the fourth position. Pancreatic cancer rose in the ranking to the fifth most registered cancer in 2018 due to an increase in absolute numbers (matching rectum and multiple myeloma figures of 31 cases). Lung cancer continues to be comparatively low in Barbados, ranked 8th in 2018 as opposed to 3rd globally. In Table 2, the ranking is colour-coded to track the change in ranking of the site, for each year – moving from green (highest ranked) to red (lowest ranked).

Table 2: Number, Percentage and Rank of the top 10 cancer sites, Barbados

Site	Number of Tumours (% of all)											
Year	Rank	2018	Rank	2017	Rank	2016	Rank	2015	Rank	2014	Rank	2013
Prostate	1	221 (24%)	1	276 (30.3%)	1	287 (28.1%)	1	235 (22.3%)	1	185 (21.9%)	1	187 (22.2%)
Breast	2	177 (19.3%)	2	164 (18%)	2	150 (14.7%)	2	206 (19.6%)	2	156 (18.5%)	2	138 (16.4%)
Colon	3	116 (12.6%)	3	104 (11.4%)	3	112 (11%)	3	118 (11.2%)	3	104 (12.3%)	3	110 (13%)
Corpus uteri	4	53 (5.8%)	4	39 (4.3%)	4	48 4.7%)	5	45 (4.3%)	4	38 (4.5%)	6	32 (3.8%)
Pancreas	5	31 (3.4%)	6	33 (3.6%)	9	29 (2.8%)	9	28 (2.7%)	9	22 (2.6%)	9	24 (2.8%)
Multiple myeloma	6	31 (3.4%)	12	16 (1.8%)	7	35 (3.4%)	8	31 (2.9%)	6	31 (3.7%)	12	15 (1.8%)
Rectum	7	31 (3.4%)	5	36 (3.9%)	5	42 (4.1%)	4	47 (4.5%)	7	26 (3.1%)	4	45 (5.3%)
Lung	8	28 (3%)	7	22 (2.4%)	6	42 (4.1%)	7	31 (2.9%)	5	33 (3.9%)	7	28 (3.3%)
Non-Hodgkin lymphoma	9	23 (2.5%)	11	16 (1.8%)	13	19 (1.9%)	10	26 (2.5%)	12	16 (1.9%)	8	25 (3%)
Stomach	10	21 (2.3%)	8	21 (2.3%)	8	30 (2.9%)	6	38 (3.6%)	10	21 (2.5%)	11	18 (2.1%)

Geographic Distribution of Cancer in the Population

Figure 1 shows the distribution of cancer in Barbados per 100,000 population for the years 2013 – 2018 by parish. The lowest number of cases per 100,000 persons was found in St. James (311 per 100,000), while the highest was seen in St. Andrew (373 per 100,000). 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.



Parish	Cancer Cases 2013-2018	2010 Total Pop	Average Annual Rate
Christ Church	1190	54,336	365
St. Andrew	115	5,139	373
St. George	427	19,767	360
St. James	531	28,498	311
St. John	170	8,963	316
St. Joseph	126	6,620	317
St. Lucy	210	9,758	359
St. Michael	1886	88,529	355
St. Peter	252	11,300	372
St. Philip	586	30,662	319
St. Thomas	299	14,249	350

Figure 1: Distribution of cancer cases per 100,000 in Barbados by Parish (BSS Pop 277,821), 2013-2018

Cancer Distribution by Gender

Figure 2 shows the distribution of the top 10 cancer sites by gender. In 2015 the highest number of cases in women was recorded.

Table 3 examines the top five cancer sites, by gender more closely for the latest reporting year (2018). Prostate and breast cancers continued to account for the highest number of cases in men and women respectively. For the first time, pancreatic cancers were in the top five causes of cancer in women and multiple myeloma was in the top five in both genders in 2018.

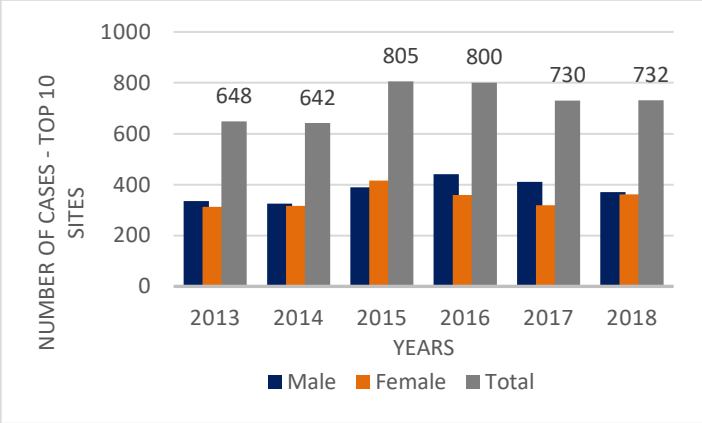


Figure 2: Number of cases from top 10 cancer sites, by gender

Table 3: Number and percentage of the top five cancer sites by gender, and ASIR with 95% confidence intervals (95%CI), Barbados, 2018, Women (148,115) Men (138,525)

Gender	Site	Number of tumours	% of all tumours	ASIR	95% CI
Women (total cases)		**484**	**100.0**	**205.1**	**186.0 – 225.8**
Breast		176	36.4	82.4	70.0 – 96.5
Colon		60	12.4	22.8	17.2 – 30.1
Corpus Uteri		53	10.9	20.3	15.1 – 27.1
Pancreas		18	3.7	5.6	3.2 – 9.7
Multiple Myeloma		15	3.1	6.2	3.3 – 11.0
Men (total cases)		**476**	**100.0**	**218.2**	**198.6 – 239.4**
Prostate		221	46.4	100.4	87.5 – 115.0
Colon		56	11.8	27.1	20.3 – 35.7
Rectum		23	4.8	10.5	6.6 – 16.1
Lung		21	4.4	9.0	5.5 – 14.3
Multiple Myeloma		16	3.4	7.3	4.1 – 12.4

Note 2: ASIRs are calculated on malignant tumours only, therefore the total excludes non-malignant diagnoses – see case definition in Appendix.

Note 3: Note: the percentage of tumours for women of all tumours, 484/960, is 50.4% and for men, 476/960, is 49.6%

Age-standardised Incidence Rates (ASIR)

The age-standardised incidence rates for colon, corpus uteri and multiple myeloma were stable over the six-year period. There was a general trend towards increasing breast cancer incidence rates over the six-year period while prostate cancer incidence showed a steady decline from 2016 onward.

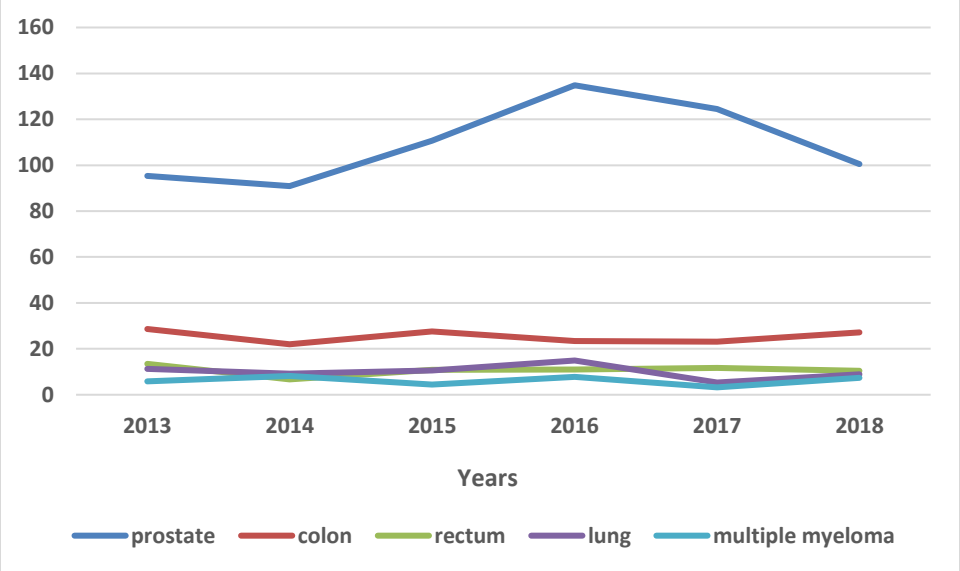


Figure 3: Age-standardised Incidence Rate (ASIR) curves for top five cancers, Men, 2013 – 2018

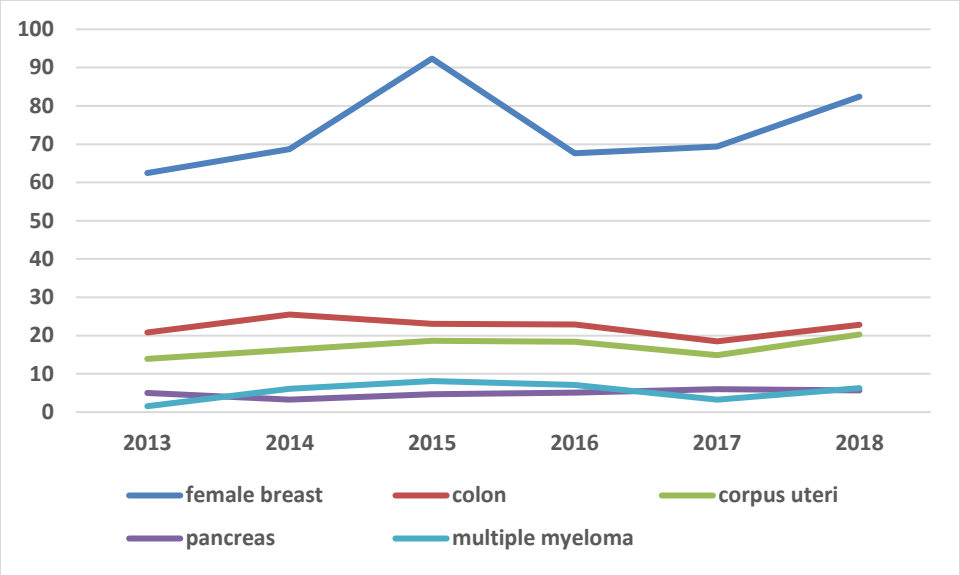
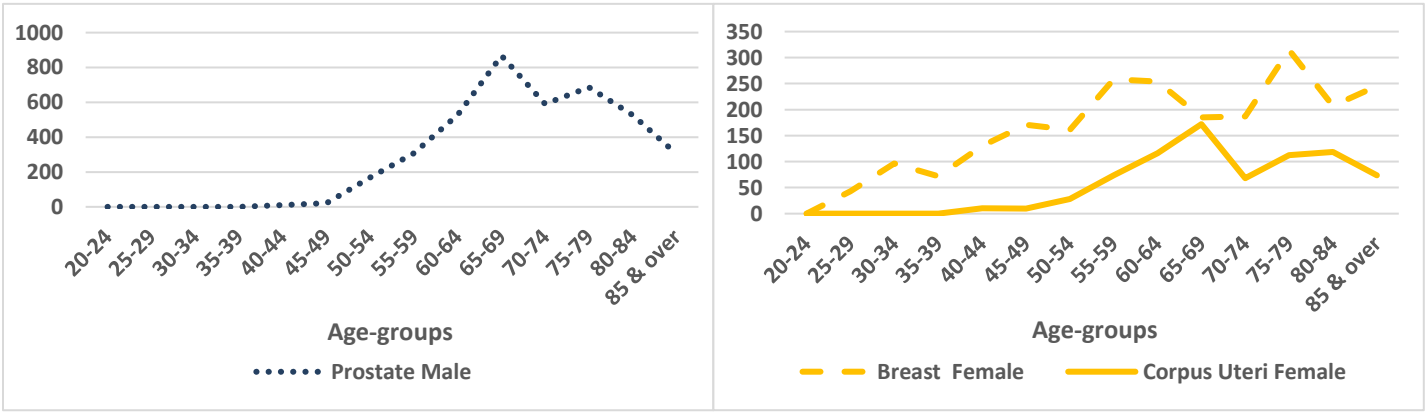


Figure 4: Age-standardised Incidence Rate (ASIR) curves for top five cancers, Women, 2013 – 2018

Age and Gender Stratified Incidence

Figure 5 graphically depicts the age and gender stratified incidence in 2018. The data demonstrated peaks in cancer incidence in men in the 65 – 69 age group, while cancers in women were spread more proportionately across the age groups over the age of 55. Women were experiencing more cancers in the younger age groups (primarily breast cancer under age 40), while the incidence in men climbed swiftly and overtook that of women between the age of 45 – 49 years old, where most men will present with prostate cancer.



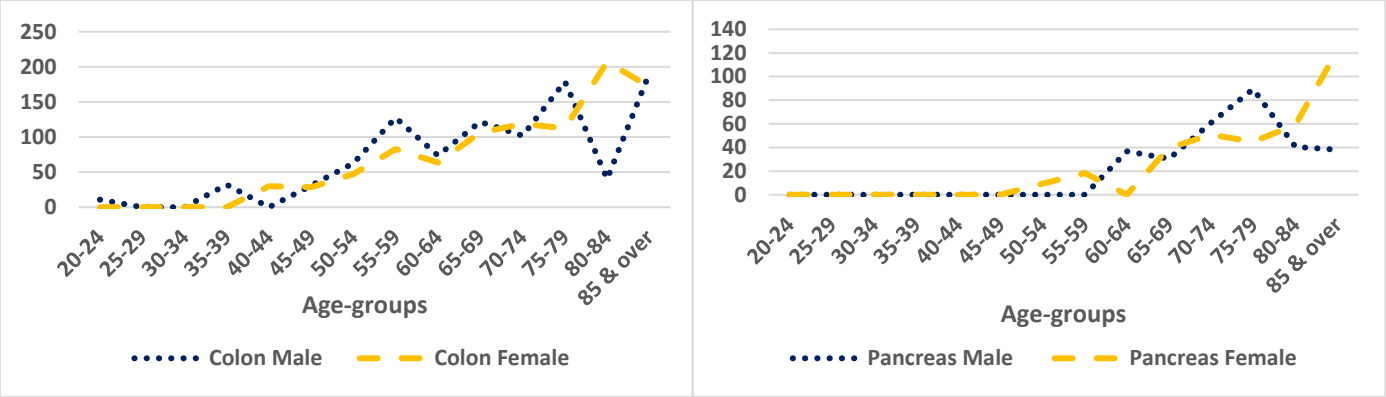


Figure 5: Age-Specific Rates for Top 5 cancers by Gender, 2018

Mortality

Cancer Deaths (2013-2021)

Table 4 shows the number of cancer-related deaths by year for the most recent years of data (2013-2021), as well as the age-standardised mortality rates for all cancers for the same period.

Table 4: Cancer-related Deaths by Year, 2013–2021

Years	Number	ASMR	95%UI
2013	577	124.6	114.1 – 135.9
2014	651	132.9	122.3 – 144.3
2015	631	125.9	115.7 – 136.8
2016	658	131.4	121.1 – 142.6
2017	670	129.7	119.6 – 140.7
2018	658	129.0	118.8 – 140.0
2019	688	129.6	119.5 – 140.3
2020	669	123.9	114.2 – 134.3
2021	700	146.1	135.2 – 157.8

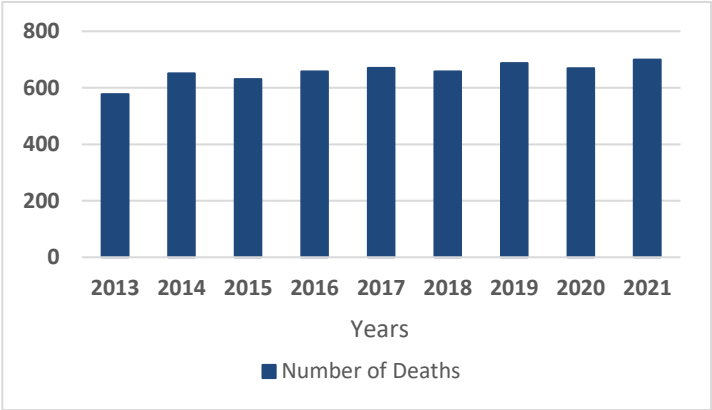


Figure 6: Cancer Deaths in Barbados, 2013-2021

Cancers of the prostate, breast and colon represent approximately 45% of the cancer-related deaths annually from 2013 – 2019, rising to 48.6% of cases in 2020 and 46% of cases in 2021.

Age-standardised Mortality Rates (ASMR)

Barbados is considered to have the highest ASMR for breast cancer globally for 2019 based on estimates by the World Cancer Research Fund[2]. This is counter to the global trend of decreasing age-standardised

mortality rates for breast cancer[4]. The reason for the apparent spike in breast cancer deaths in 2018-2019 (Figure 6) needs to be investigated. Prostate cancer accounts for the majority of cancer-related deaths in Barbados. While all-cause mortality is commonly used in cancer, as shared at the BNR Annual CME 2022[5], death certification practices need to be improved, to ensure that the underlying cause of death is accurate. Commonly, a man will die with and not from prostate cancer, therefore a continued trend of high ASMRs for prostate cancer needs to be investigated further. Additionally, correctly certified deaths will allow greater confidence in our prostate mortality statistics and greater evidentiary basis for investigating the challenges surrounding prostate cancer.

Of note, age-standardised mortality rates are increasing for all five cancers from 2020 - 2021. This might indicate that COVID-19 had an impact on cancer deaths either through the postponement of key clinics, the reduction/postponement of surgical interventions, reduced access to care or changes in health seeking behaviours due to fear of exposure to COVID-19, or due to reduced availability of treatments. This highlights the need for future and ongoing monitoring of excess mortality.

Note that the top three causes of cancer-related deaths remain the same annually, however the fourth and fifth ranked causes often switch between lung, pancreas and rectum. Figure 7 shows the ASMRs ordered based on the top five causes of cancer-related death in 2018, against the age-standardised mortality rates for all cancer deaths.

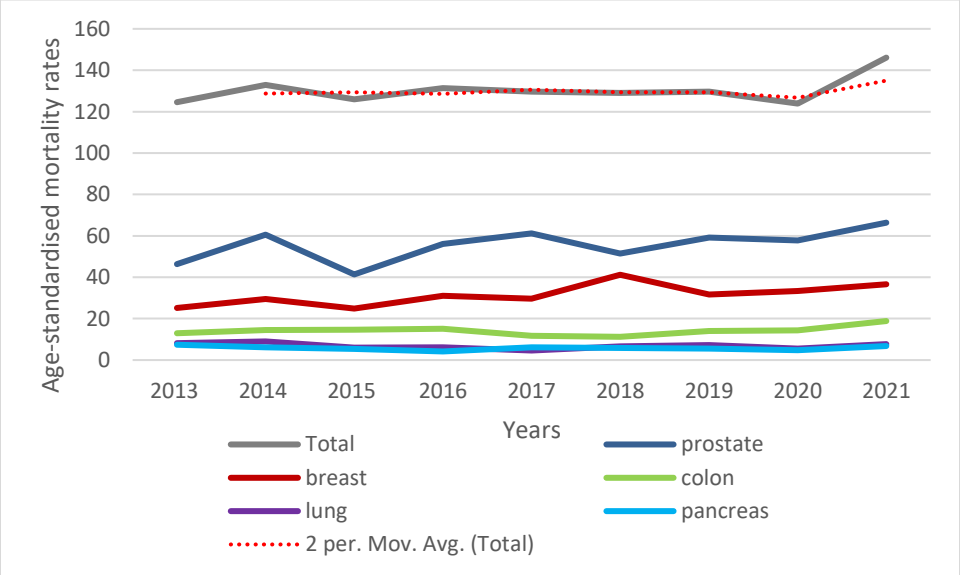


Figure 7: Age-Standardised Mortality Rates for all cancers and the top five causes of cancer death, Barbados, 2013 - 2021

During the data collection for 2016–2018, the Barbados National Registry would have implemented a more robust use of death certification data as a data collection tool; investigating and capturing deaths registered by death certificate only more closely (this is an international registry practice). This increase

[4] Xu S, Liu Y, Zhang T, Zheng J, Lin W, Cai J, Zou J, Chen Y, Xie Y, Chen Y, Li Z. The Global, Regional, and National Burden and Trends of Breast Cancer From 1990 to 2019: Results From the Global Burden of Disease Study 2019. Front Oncol. 2021 May 21;11:689562. doi: 10.3389/fonc.2021.689562. PMID: 34094989; PMCID: PMC8176863.

[5] Forde, S. Using Death Certificates to determine Cancer Mortality Burden. BNR Annual CME Series: Are Cancer Deaths Increasing? Improving Cancer Mortality Statistics Webinar. August 26, 2022.

in cases can be seen in Table 5, which shows the number of cancer deaths captured by the BNR by place of death. Also of note is the increase in cancer patients who would have died at home in 2016-2017.

Table 5: Figures for places of death for cancer cases, Barbados, 2013–2018

Place of Death	2013	2014	2015	2016	2017	2018
QEH	58	56	160	326	254	237
At Home	39	37	102	181	179	112
Geriatric Hospital	1	5	-	7	8	8
Convalesce./Nursing Home	-	2	10	15	18	9
District Hospital	-	1	-	2	1	1
Psychiatric Hospital	1	-	2	-	2	-
Private Hospital/Emergency Clinic	-	2	5	8	13	7
Other/Hotel	1	2	8	13	18	9

Basis of diagnosis was reviewed as a quality indicator for cancers diagnosed in 2013–2018. In 2015, there were a larger number of cases registered by DCO than previous years, as well as increased numbers of cases diagnosed clinically or through clinical investigation only (2015-2017).

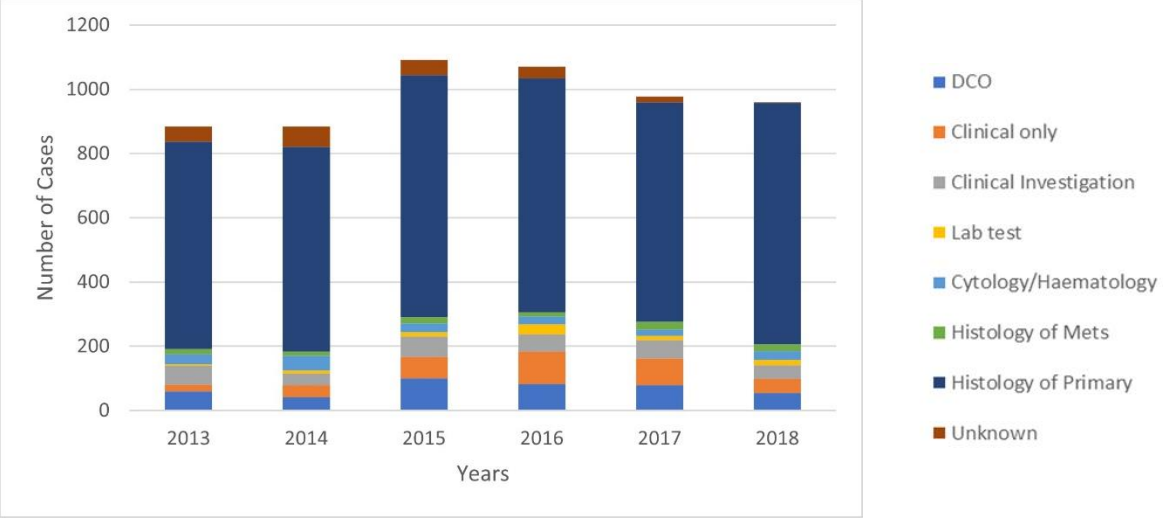


Figure 8: Basis of Diagnosis for Cancer Cases 2013–2018

Death Certificate Only (DCO) Cases

As noted above, death certificate only (DCO) cases can have an impact on reported incidence. The prevalence of death certificate only cases is not only an indication of the level of cooperation of the private physicians and the accessibility of health information, but, along with stage, may be an indication of late-stage presentation, lack of access to diagnostic tools in the population and other challenges

across the care continuum (like poor identification of cancer symptoms and care seeking habits). Therefore, a closer look at death certificate only cases as an indicator is a vital part of cancer surveillance. The below tables (Tables 6-7) are extracted from a Data Quality Review Report, conducted by The International Agency for Research on Cancer (IARC) Caribbean Cancer Registry Hub at CARPHA on BNR data up to 2015[6]. The comparisons indicate the need for improvement.

Table 6: Comparison of MV (%) and DCO (%) for Select Cancers, for Men, from The IARC Hub Data Quality Review

Cancer Site	Barbados (2008, 2013-2015)		Martinique (2008-2012)		Jamaica (2008-2011)		U.S. Puerto Rico (2008-2012)	
	MV(%)	DCO(%)	MV(%)	DCO(%)	MV(%)	DCO(%)	MV(%)	DCO(%)
Lip, oral cavity and pharynx (C00-14)	97.1	1.4	98.7	-	94.9	0.0	96.0	2.5
Oesophagus (C15)	84.0	4.0	92.4	-	73.9	0.0	91.2	6.1
Stomach (C16)	82.0	9.8	97.6	-	75.2	3.0	91.4	5.8
Colon, rectum, anus (C18-21)	89.4	4.4	97.1	-	87.0	0.0	95.4	2.8
Liver (C22)	40.0	0.0	64.3	-	50.0	10.0	61.8	19.0
Pancreas (C25)	18.4	24.5	54.3	-	20.7	6.9	69.4	15.1
Larynx (C32)	100.0	0.0	97.8	-	96.7	0.0	97.3	1.9
Lung, trachea, bronchus (C33-34)	50.6	15.3	95.2	-	58.7	6.3	78.6	11.3
Melanoma of skin (C43)	93.8	0.0	92.1	-	100.0	0.0	96.4	1.8
Prostate (C61)	83.9	8.4	98.0	-	86.2	1.6	95.6	3.3
Testis (C62)	100.0	0.0	100.0	-	100.0	0.0	98.7	1.0
Kidney & urinary NOS (C64-66,68)	68.6	2.9	89.8	-	54.2	0.0	90.1	4.2
Bladder (C67)	86.8	2.6	97.1	-	90.8	1.5	96.8	1.5

Table 7: Comparison of MV (%) and DCO (%) for Select Cancers, for Women, from The IARC Hub Data Quality Review

Cancer Site	Barbados (2008, 2013-2015)		Martinique (2008-2012)		Jamaica (2008-2011)		U.S. Puerto Rico (2008-2012)	
	MV(%)	DCO(%)	MV(%)	DCO(%)	MV(%)	DCO(%)	MV(%)	DCO(%)
Mouth & pharynx (C00-14)	100.0%	0.0%	100.0	-	96.9	0.0	94.7	0.0
Oesophagus (C15)	70.0%	10.0%	100.0	-	84.6	0.0	82.4	10.1
Stomach (C16)	68.2%	13.6%	99.4	-	74.5	0.0	92.4	5.1
Colon, rectum, anus (C18-21)	83.4%	8.5%	96.8	-	87.0	0.8	94.3	3.5
Liver (C22)	35.7%	14.3%	84.8	-	14.3	0.0	53.1	29.2
Pancreas (C25)	31.4%	28.6%	62.6	-	46.4	3.6	70.0	15.1
Larynx (C32)	66.7%	0.0%	100.0	-	100.0	0.0	95.7	1.4
Lung, trachea, bronchus (C33-34)	71.4%	8.6%	97.2	-	63.0	1.9	81.4	10.5
Melanoma of skin (C43)	88.9%	0.0%	97.2	-	100.0	0.0	98.2	0.4
Breast (C50)	93.5%	4.2%	99.1	-	98.4	0.0	98.0	1.4
Cervix (C53)	90.8%	4.6%	100.0	-	97.0	0.0	97.5	1.4
Corpus & Uterus NOS (C54-55)	88.5%	4.8%	98.0	-	94.3	0.0	99.3	0.3
Ovary & adnexa (C56)	81.6%	6.1%	94.3	-	75.9	3.7	85.8	7.6
Kidney & urinary NOS (C64-66,68)	82.8%	6.9%	68.4	-	100.0	0.0	90.3	5.3
Bladder (C67)	81.8%	9.1%	30.9	-	82.1	0.0	93.9	3.9

[6] Data Quality Assessment Report for the Barbados National Registry for Chronic Non-Communicable Diseases (NCDs)–Cancer for the Diagnosis Years 2008, 2013, 2014, 2015, IARC Caribbean Cancer Registry Hub, Caribbean Public Health Agency (CARPHA), Steering Committee for the IARC Caribbean Cancer Registry Hub, October 2021

Age-specific Mortality rates

Age stratified mortality rates for the top five cancers by gender is demonstrated in Figure 9. The trends are quite similar to those reported in 2015. While all three cancers are increasing with age as is expected, prostate cancer shows a sharp rise after age 55, while the other cancers show a more gradually increasing trend.

A closer look at the top five cancers shows a marked increase in deaths after the age of 70 years old in most cases, demonstrating the increased risk of cancer with age.

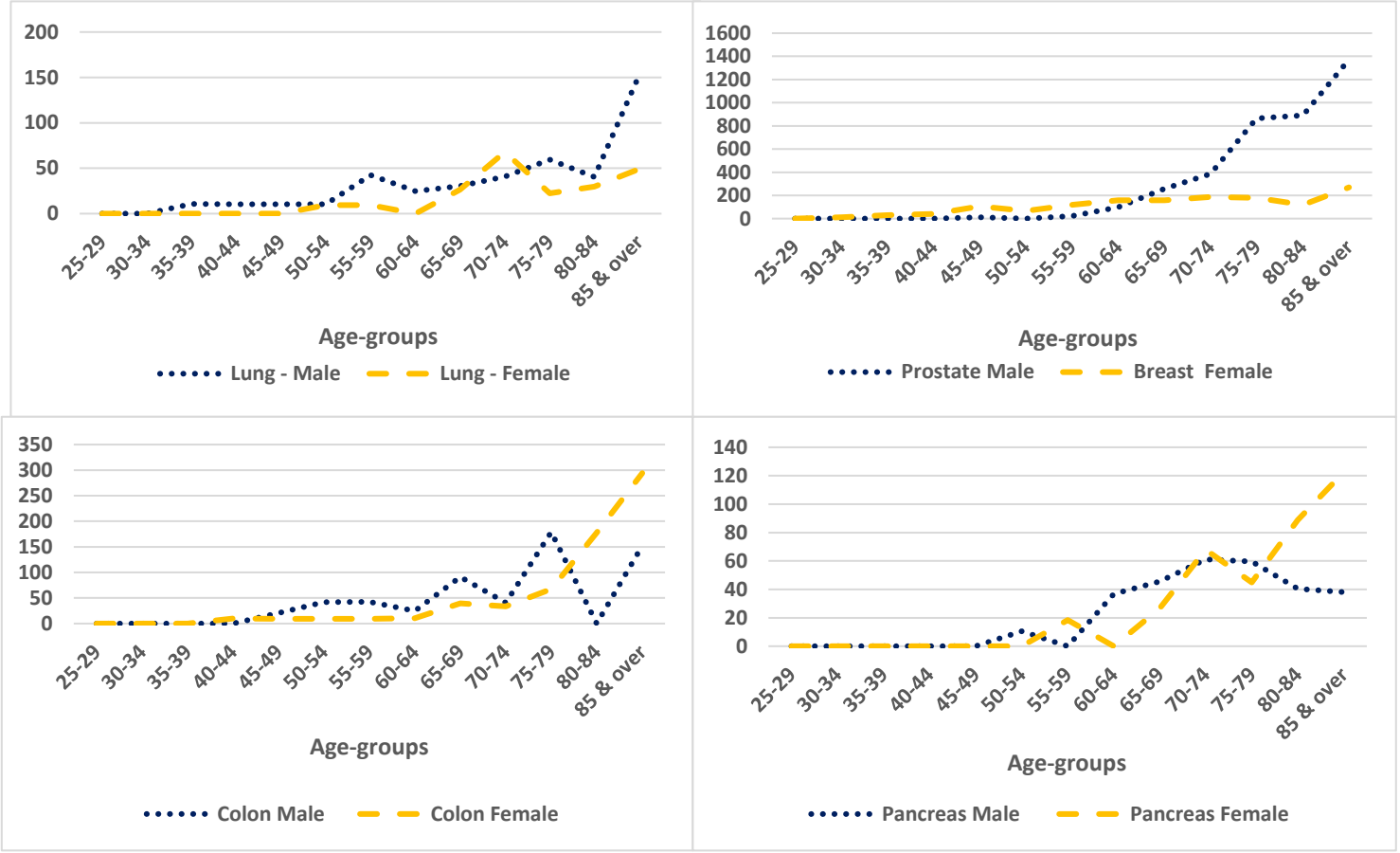


Figure 9: Age and gender stratified mortality by site for the top five causes of cancer-related deaths, 2018

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

The mortality-to-incidence (M:I) ratio 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[7]. Table 7 shows the M:I Ratios for 2013–2015 as compared with 2016–2018. Several of the sites showed little to no improvement indicating a need for national screening programs to assist in

[7] 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

identifying and tackling these cancers. National screening programmes may improve M:I ratios in cancers for which screening effectively reduces premature mortality. The M:I ratio for cervical cancer has improved over the two time periods and it has moved from the fifth ranked cancer in 2014, to falling consistently outside of the top ten cancers (often 13th – 14th in ranking, 2015-2018). While breast cancer, which does have accessibility to opportunistic screening through mammograms, is still seeing increasing incidence and mortality, this may indicate that screening is not easily accessed by a sizeable percentage of the population or the propensity of these programs to screen and re-screen the same pool of persons, an indicator of the need for a national program.

Table 8: Mortality-to-Incidence Ratios for Select Cancers 2013–2015 and 2016–2018

Site	Gender	2013-2015	2016-2018	M:I ratios[+]
Colon, rectum, anus (C18-21)	Women	0.6	0.6	0.4-0.7
Colon, rectum, anus (C18-21)	Men	0.6	0.6	0.4-0.7
Pancreas (C25)	Women	0.7	0.5	0.9-1.2
Pancreas (C25)	Men	0.8	0.7	0.9-1.1
Lung, trachea, bronchus (C33-34)	Women	0.5	0.6	0.9
Lung, trachea, bronchus (C33-34)	Men	0.6	0.6	0.9-1.0
Breast (C50)	Women	0.4	0.5	0.2-0.4
Cervix (C53)	Women	0.8	0.3	0.2-0.3
Corpus & Uterus NOS (C54-55)	Women	0.6	0.5	0.2-0.5
Prostate (C61)	Men	0.6	0.5	0.2-0.8*
Kidney & urinary NOS (C64-66,68)	Women	0.3	0.4	0.3-0.7
Kidney & urinary NOS (C64-66,68)	Men	0.5	0.6	0.3-0.6
Bladder (C67)	Women	0.4	0.1	0.5-0.7
Bladder (C67)	Men	0.4	0.7	0.3-0.5
Lymphoma (C81-85,88,90,96)	Women	0.8	0.8	0.4-0.6
Lymphoma (C81-85,88,90,96)	Men	0.7	0.8	0.4-0.7

*Note 4: [+]M:I Ratios for Other Registries in the Region 2003-2007 from IARC Caribbean Hub Evaluation (quoted as a percentage in IARC Report) *Includes rates for Cuba, Puerto Rico and Martinique, which is considered to have the second highest prostate mortality globally*

Prostate and Colorectal Cancer – A Closer Look, 2018

Prostate Cancer

The Barbados National Cancer Study (BNCS) conducted from 2002-2006 reported an ASIR (WHO world standard population) of 112.0 (95% CI: 105.2–119.3) for prostate cancer, which at the time was lower than the rates for Martinique at 175.3[8]. The data in this report indicates that while ASIRs fluctuated, in 2018, they were reported at a similar rate of 100.4, and the average ASIR over the period 2013–2018 was 109.5 per 100,000. This indicates that the incidence rate has remained stable over time when age is removed from the equation.

This rate is comparable with the estimate by the World Cancer Research Fund (110 per 100,000) and suggests that Barbados has the fourth (4th) highest ASIR globally, with Guadeloupe and Martinique recording the highest (183.6 and 168.2 respectively)[2].

Prostate cancer represents the largest contributor to cancer deaths in Barbados. The age-standardised mortality rate indicated in Figure 6 above is similar to that reported by the World Cancer Research Fund (40.2 per 100,000) suggesting that Barbados has the 2nd highest ASMR globally[2] among reporting countries, while IARC estimates suggest that Barbados has the highest ASMR.

In 2018, the BNR reviewed and staged prostate cancer cases based on the available information obtained from charts/notes, pathology reports and any reported imaging. Both Summary Stage (SEER) and TNM staging (AJCC) were used. Summary staging is meant to be the most simplified method of staging and is often used in territories where the detailed information needed for TNM staging is unavailable.

TNM staging is a method of classifying cancer spread by describing the size of the tumour and its impact on surrounding tissues (T), the number of lymph nodes to which the cancer has spread to (N) and whether there is spread to distant organs (M). The accuracy and number of cases that can be staged is dependent on the amount of well-documented, accessible information. Adequate staging requires pathology and immediate imaging. Without imaging, the cancer stage at diagnosis will not be complete. In addition, biopsies of both lobes of the prostate are necessary to determine the extent of disease, however, some clinicians do not clearly identify which lobes were biopsied. This demonstrates the need for standardised guidelines for diagnostic procedures including timelines for staging investigations.

The staging presented in this report represents the clinical stage (stage before surgery based on biopsy and clinical tests) or the pathological stage (clinical stage with the addition of surgical information), where applicable. The prostate cancers were staged by the pathologist (if seen on the report), verified by or staged by the BNR cancer registration team based on the information reported. There were 17%

[8] Rose AMC, Martelly TN, Craig L, Campbell J, Hambleton I, Prussia P. Cancer in Barbados 2008: Annual report of the BNR-Cancer. Chronic Disease Research Centre, The University of the West Indies, St Michael, Barbados.

unknown Summary Stage and 23% unknown TNM stage. Approximately 43% of prostate cases were localised according to TNM and 70% were localised according to Summary Stage. This is incongruent with the high mortality rates reported by the BNR. This may be related to the unavailability of access to patient notes; a large percentage of the cases were staged based on first biopsy or prostatectomy, with no evidence of staging-related imaging and testing having been completed (X-rays, bone scans etc). This was determined by accessing the QEH notes and the Polyclinic or Oncology notes on MedData, where available. However, notes of those who were deceased were difficult to access due to COVID-19 and the archiving challenges at the QEH.

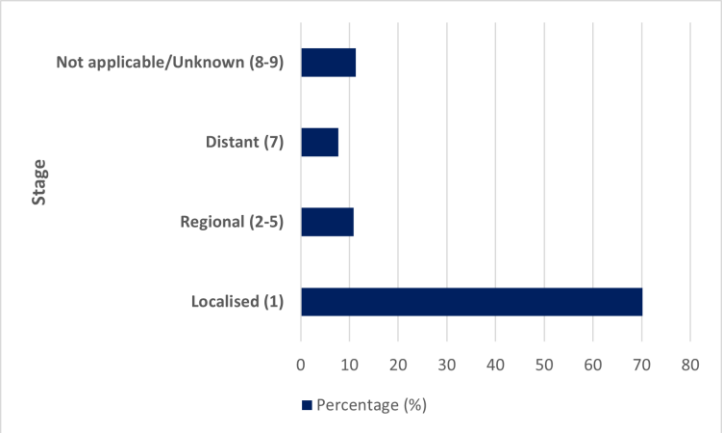


Figure 11: Prostate Cancer Cases, Summary Staging, 2018

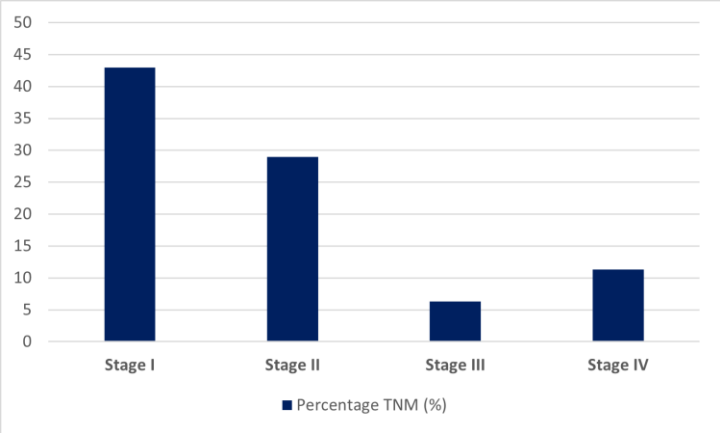


Figure 12: Prostate Cancer Cases, TNM Stage, 2018

Colorectal Cancer

In 2018, Colorectal cancer represented approximately 15% of cancer cases in Barbados. Colorectal cancer cases were staged according to Summary Stage for 2013 and 2018, and Essential TNM and TNM stage for 2018. Essential TNM is a modified form of TNM staging, meant to allow comparable staging for key sites, that is more detailed than Summary Staging, but not as detailed as TNM. By staging these cases by all three modalities, the BNR tested the feasibility of staging cases of colorectal cancer when there is a lack of access to patient information. One of the key challenges immediately in 2018 was the number of cases that could not be staged by TNM or Essential TNM due to lack of information (several pathology reports did not state key information like the depth of invasion, or impact on surrounding structures). Figures 12 and 13 shows the results.

While the percentage of cases with unknown stage in 2018 (35% for TNM; 32% for Essential TNM and 28% for SEER) impacted the distribution, when compared to figures produced by The International Agency for Research on Cancer (IARC) SurvMark[9] figures for Stage 2010 – 2014, the percentage of cases staged as Regional were proportionate. Cases classified as Regional by Summary Stage includes those

[9] https://gco.iarc.fr/survival/survmark/. Accessed September 5, 2022.

cases which have spread to adjacent structures as well as spread to the lymph nodes closest to the organ.

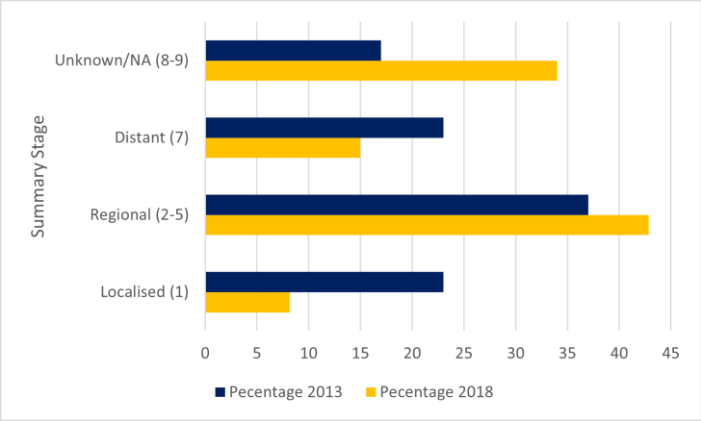


Figure 13: Colon Cancer Cases, Summary Staging, 2013 and 2018

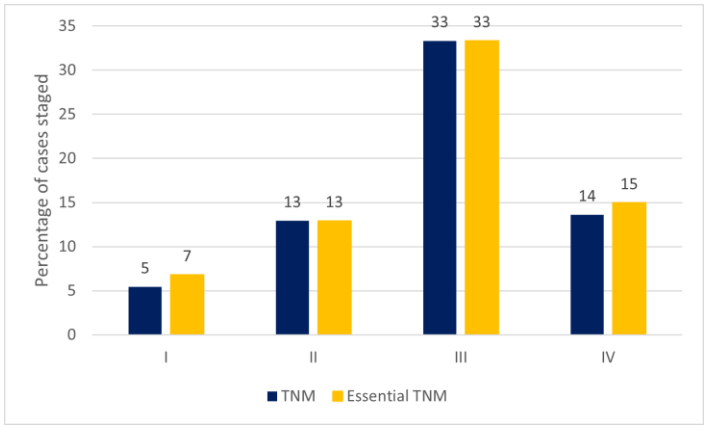


Figure 14: Colon Cancer Cases, TNM and Essential TNM Staging, 2013 and 2018

Data Quality

This report represents the outputs of data which were collected during the COVID-19 pandemic. Data quality indices suggest that despite challenges, the BNR was able to collect comparable and high-quality data on incidence and mortality, as well as review data on cancer deaths.

Completeness is the degree to which all diagnosed neoplasms within a registry's catchment population are included in the registry database. One measure of completeness is the number of sources per case, which is one of the key features of a population-based cancer registry[10]. Two sources per case is considered a minimum[11]. 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 demonstrated a high level of completeness, recording an average of 2 sources per case over the four years (2015-2018).

Table 9: Review of Completeness – Number of Sources per Case, Barbados 2015–2018

Source	2018 Total Records (%source)	2017 Total Records (%source)	2016 Total Records (%source)	2015 Total Records (%source)
QEH	1439 (63.1%)	1268 (59.1%)	1574 (62.8%)	1271 (60.3%)
Private Laboratory	501 (22.0%)	441 (20.5%)	450 (18.0%)	400 (19.0%)
Death Registry	282 (12.4%)	338 (15.7%)	329 (13.1%)	392 (18.6%)
Polyclinic	50 (2.2%)	73 (3.4%)	101 (4.0%)	.
Private Physician	7 (0.3%)	26 (1.2%)	43 (1.7%)	44 (2.1%)
Unknown/Bay View/Other	.	1 (0.1%)	8 (0.3%)	2 (0.1%)
Total Sources	2279	2147	2505	2108
Total Cases*	963	979	1075	1066
Average Sources	2.37	2.19	2.33	1.98

*Notes 5: *These totals represent all potential cases before duplicates are dropped*

The impact of the sources on the data (as discussed in the DCO section) is also demonstrated in Table 8. Due to the lack of notification by Private Physicians, the BNR has sought to incorporate new sources and reduce the reliance on notifications. As such, the table reflects the introduction of MedData, and therefore access to Polyclinic-level data, as a vital source. In addition, the Private Laboratory has become an important and necessary source of data.

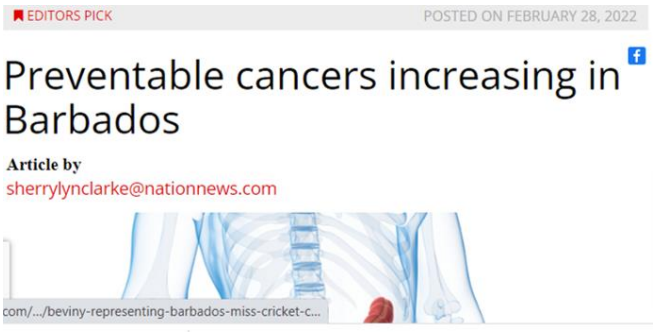
[10] Bray F, Znaor A, Cueva P, et al. Planning and Developing Population-Based Cancer Registration in Low- or Middle-Income Settings. Lyon (FR): International Agency for Research on Cancer; 2014. (IARC Technical Report, No. 43.) Chapter 4., Sources of information for the population-based cancer registry. Available from: https://www.ncbi.nlm.nih.gov/books/NBK566950/

[11] Quality Control at the Cancer Registry, Completeness. March 2019. Lecture Presented: GICRNet Learning Module, IARC's GICRNet masterclass on Data Quality; December 2018.

BNR Professional and Public Engagement

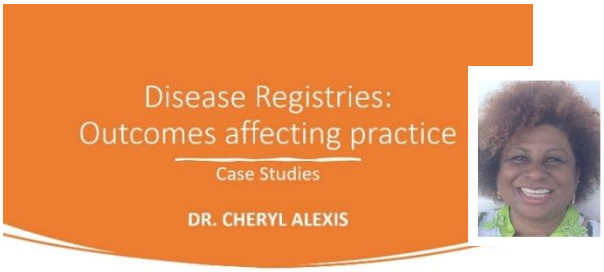
The below are some of the professional and public engagement activities which the BNR hosted in 2021–2022.

Report Dissemination (Media)



Continued Medical Education

BAMP webinar – "Improving Data to Improve Care" presented by Dr Cheryl Alexis and the IARC Caribbean Cancer Registry Hub and partners on behalf of the Barbados National Registry



Local, Regional and International Presentations

Forde, S. "The Impact of COVID-19 on Registries with Active, Paper-Based Collection Methods: the Barbados National Registry Experience. International Association for Research in Cancer (IACR) Scientific Conference, Virtual, 14 October 2021

Sobers, N. "Trends in cancer incidence, mortality, and survival rates from a Population-based cancer registry in Barbados: Cohort Study Analysis, International Association for Research in Cancer (IACR) Scientific Conference, Poster, 12-14 October 2021

Sobers, N. "Combatting the Big C's: Cancer Data for Cancer Action in The Context of COVID-19", CARPHA COVID-19 Health Rounds, Virtual, 11 November 2021

International Calls for Registry Data and Data Evaluations

- BNR submitted to the Cancer in Five Continent (CI5) Publication call for data, for the first time
- Received a positive Data Evaluation by the IARC Caribbean Cancer Registry Hub

Trainings Led by BNR Staff

Jacqueline Campbell - GICR*Net* Trainer - *Practical Guide to using the IACRcrgTools Conversion and Check Programs for Cancer Registries* on Thursday 22nd July 2021.

The Quality Control of Data sessions at Virtual Caribbean Course on Cancer Registration: Basic Principles and Methods for the Organisation of Eastern Caribbean States, November 16-18, 2021

Appendices

Appendix A – ASIRs – Top 15 Cancers, 2016 - 2018

2018				
Years	**Number**	**%**	**ASIR**	**95% UI**
Prostate	221	23.0	100.4	87.5 - 115.0
Female Breast	176	18.3	82.4	70.0 - 96.5
Colon	116	12.1	24.9	20.4 - 30.2
Corpus uteri	53	5.5	20.3	15.1 - 27.1
Multiple myeloma	31	3.2	6.7	4.5 - 9.8
Pancreas	31	3.2	5.6	3.8 - 8.3
Rectum	31	3.2	6.3	4.3 - 9.3
Lung (incl. trachea and bronchus)	28	2.9	5.3	3.5 - 8.0
Non-Hodgkin lymphoma	23	2.4	5.0	3.1 - 7.7
Stomach	21	2.2	4.3	2.6 - 6.9
Kidney	18	1.9	5.1	2.9 - 8.3
Bladder	18	1.9	3.2	1.9 - 5.4
Cervix uteri	13	1.4	6.8	3.5 - 12.1
Thyroid	11	1.1	3.0	1.4 - 5.6
Larynx	11	1.1	2.2	1.1 - 4.2
2017				
Years	**Number**	**%**	**ASIR**	**95% UI**
Prostate	276	28.3	124.5	110.0 - 140.6
Female Breast	161	16.5	69.4	58.6 - 81.8
Colon	104	10.6	20.5	16.6 - 25.2
Corpus uteri	39	4.0	14.9	10.5 - 20.9
Multiple myeloma	16	1.6	3.2	1.8 - 5.5
Pancreas	33	3.4	6.6	4.5 - 9.5
Rectum	36	3.7	7.8	5.4 - 11.1
Lung (incl. trachea and bronchus)	22	2.3	4.2	2.5 - 6.7
Non-Hodgkin lymphoma	16	1.6	4.2	2.3 - 7.1
Stomach	21	2.2	4.5	2.7 - 7.1
Kidney	12	1.2	2.8	1.4 - 5.2
Bladder	17	1.7	3.2	1.8 - 5.5
Cervix uteri	12	1.2	6.1	3.0 - 11.1
Thyroid	14	1.4	4.0	2.1 - 7.0
Larynx	.	0.6	1.2	0.4 - 3.0
2016				
Years	**Number**	**%**	**ASIR**	**95% UI**
Prostate	287	26.8	134.8	119.5 - 151.8

Female Breast	149	13.9	67.7	56.8 - 80.2
Colon	112	10.5	22.9	18.8 - 27.9
Corpus uteri	48	4.5	18.4	13.4 - 24.9
Multiple myeloma	35	3.3	7.4	5.1 - 10.5
Pancreas	29	2.7	5.8	3.9 - 8.7
Rectum	42	3.9	9.0	6.4 - 12.4
Lung (incl. trachea and bronchus)	42	3.9	8.7	6.2 - 12.1
Non-Hodgkin lymphoma	19	1.8	4.4	2.6 - 7.2
Stomach	30	2.8	5.0	3.3 - 7.5
Kidney	23	2.2	6.2	3.8 - 9.6
Bladder	12	1.1	2.0	1.0 - 4.0
Cervix uteri	25	2.3	11.3	7.1 - 17.3
Thyroid	11	1.0	2.7	1.3 - 5.0
Larynx	.	0.9	2.1	1.0 - 4.2

Appendix B – Acknowledgements

Authors

Sobers N, Campbell JM, Forde SA, Hambleton IR, Anderson, SG, Prussia, P, and the BNR-Cancer Surveillance Team

Contributors: BNR-Cancer Surveillance Team

Dr N Sobers, Principal Investigator

Mr. K Gill, Senior Data Abstractor

Ms. T Hunte, Data Abstractor

Mrs. SA Forde, BNR Registrar

Ms. JM Campbell, Quality Control Coordinator (QCC)

Ms. K Greene, Steno Clerk

Ms. A Henry, Assistant QCC

Prof. SG Anderson, GA-CDRC Director

Prof. IR Hambleton, Statistician

Prof. P Prussia, Clinical Director

Special thanks

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 (2018)

Name	Affiliation
Prof. Sir Trevor Hassell (Chair)	Chairman of the National Commission for Chronic NCDs
Prof. T. Alafia Samuels	Former Director, CDRC
Dr Godfrey Xuereb	Former Representative, PAHO/WHO
Dr Kenneth George	Chief Medical Officer, Ag. Ministry of Health and Wellness
Dr E Arthur Phillips	Senior Medical Officer of Health, Ministry of Health and Wellness
Dr Angela Rose	Former Director, BNR
Dr Dexter James	Former CEO of the QEH
Dr Richard Ishmael	Consultant Radiologist, QEH
Dr RK Shenoy	Consultant Radiotherapist, QEH
Prof. David Corbin	Consultant Neurologist, QEH; Clinical Director, BNR–Stroke
Dr Rudolph Delice	Head of Dept. of Medicine, QEH; Clinical Director, BNR–Heart
Prof. Patsy Prussia	Honorary Consultant Pathologist, QEH; Clinical Director, BNR–Cancer

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.

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 1st Revision (ICD-O-3.1), 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: haematology 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 Research electronic data capture (REDCap) 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), Research electronic data capture (REDCap), Version 12.3.3, 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).

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The Barbados National Registry for Chronic Non-Communicable Disease (BNR) George Alleyne Chronic Disease Research Centre,
The University of the West Indies, Jemmott's Lane St Michael BB 11115 Barbados

Telephone: +246 426 6416

+246 256 4267

Email: bnr@cavehill.uwi.edu

Website: www.bnr.org.bb

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