THE UNIVERSITY OF THE WEST INDIES

Barbados National Registry

MINISTRY OF HEALTH AND WELLNESS
BARBADOS

CARDIOVASCULAR DISEASE IN BARBADOS **ANNUAL REPORT 2024**

The George Alleyne Chronic Disease Research Centre

CAIHR
CARIBBEAN INSTITUTE FOR HEALTH RESEARCH

Executive Summary

What is in this report? This report provides national incidence (number of new cases), mortality (number of deaths), and survival data for strokes and heart attacks in Barbados for the years 2013 to 2022. The data for the year 2022 is new and includes the prevalence of risk factors, common symptoms /signs and a review of key performance measures.

Background. The Barbados National Registry for Non-Communicable Diseases (BNR) collects data on acute myocardial infarction and stroke. In this report, we use the terms acute myocardial infarction (AMI), acute MI and heart attack interchangeably. The BNR, on behalf of the Ministry of Health and Wellness, collects data primarily from Queen Elizabeth Hospital and Vital Statistics Registration Department, to provide the best available data on the occurrence and outcome of heart attacks and strokes in Barbados.

Heart Attacks in Barbados. In 2022, the BNR registered 556 myocardial infarctions (MI or heart attack), 302 cases in men and 254 cases in women. This included confirmed hospital diagnosed cases and cases identified after death, using death certification records. The percentage of MI cases admitted to hospital was 52% in 2022, lower than pre-pandemic levels - 63% in 2019. The age-standardised rates of new cases indicate that for every 100,000 men in the population, 146 had an MI*, while for every 100,000 women in the population 89 had an MI. The highest number of cases in men occurred in the 55-74 age group while the highest number of cases in women occurred in the over 85 age group. The age-standardised mortality rates showed that for every 100,000 men in the population 98 died from MI compared to 64 for every 100,000 women who died from MI. These rates are statistically significantly higher than rates seen pre-2021. Key performance measures indicate a lower than recommended proportion of patients receiving diagnostic procedures (ECG) and treatment (aspirin and fibrinolytics) in the acute phase of care.

Strokes in Barbados. There were 765 strokes registered in 2022, 382 in men and 383 in women. Of the 765 strokes, 264 patients experience their first-ever stroke. This included confirmed hospital diagnosed cases, community confirmed cases and cases identified after death, using death certification records. The proportion of cases admitted to hospital was 83% in 2022 compared to 89% of cases admitted in 2019. The age-standardised rates of new cases indicate that for every 100,000 men in the population, 184 suffered a stroke while for every 100,000 women, 138 suffered a stroke. The highest number of strokes in men occurred in the 65 to 74 age group while the highest number of strokes in women occurred in the 85 plus age group. Men continue to have strokes at younger ages compared to women. The proportion of strokes below age 50 was 9% - similar to percentages seen in the past 10 years. The age-standardised mortality rates for men indicated that for every 100,000 men in the population, 90 died from stroke while for every 100,000 women, 62 died from stroke in 2022. In the case of men only, these rates were statistically significantly higher than pre-2021 years. Key performance measures indicate a high number of patients receiving diagnostic procedures (CT scans) and low proportions receiving treatment (thrombolytics) in the acute phase.

*NB: All the rates that have been quoted have a margin of error that is stated in the tables of the main text.

Key messages

- Hospital admissions for strokes and heart attacks are lower than pre-pandemic, (heart attacks: 52% (290) in 2022 versus 63% (342) in 2019; strokes: 82% (556) in 2022 versus 89% (673) in 2019), further investigation is needed regarding health seeking behaviour post-pandemic.

- Men continue to have higher rates of new cases of strokes and heart attacks. Strokes and heart attacks in men occur at younger ages than they do in women and men have higher rates of death from heart attacks and strokes. A gendered approach to messaging and management is recommended.

- Age-standardised mortality rates due to heart attacks and strokes remain at relatively high levels for both men and women in 2022. This may be due to the persisting effects of the COVID-19 pandemic and further investigation is needed.

- Key performance measures indicate a lower than recommended proportion of patients receiving diagnostic procedures and treatment in the acute phase of care for both strokes and heart attacks.

Summary Statistics

Table A1: Summary statistics for the Barbados National Registry for Chronic Non- communicable Disease (the BNR) in 2022 (Population, 281,207)[1]

	Myocardial Infarction	**Stroke (all)**	**First ever Strokes**
Number of registrations[1]	556	765	264
Rate per population[2]	0.20%	0.27%	0.09%
Hospital admissions (percentage admitted) [3]	290 (52%)	634 (83%)	205 (78%)
In-hospital case fatality rate (cases with full information[4]**, n (%)**	72 (35%)	139 (28%)	92 (35%)
Death Certificate Only (DCO)[5]	314 (57%)	199 (26%)	n/a[6]
Median (range) length of hospital stay (days) (A&E to Discharge)[7a]	6 (1 - 35)	9 (1 - 187)	8 (1 - 105)
Median (range) length of hospital stay (days) (Ward to Discharge)[7b]	5 (1 - 33)	10 (1 - 186)	9 (1 - 103)

[1] (1) Total number of events registered or entered into the BNR CVD and Death databases; (2) Total number of registrations as a percentage of the population (3) Total number of hospital admissions as a percentage of registrations; (4) Case fatality rate in hospital and post discharge for hospitalised patients; (5) Total number of CVD cases collected from death registry only as a percentage of registrations; (6) n/a- Not available (7) Median and range of length of hospital stay (in days) - defined in 2 ways: (a) from date seen in A&E to discharge/death (b) from date admitted to WARD to discharge/death.

Introduction

The Cardiovascular Disease in Barbados Annual Report is prepared to provide the Ministry of Health and Wellness, the Queen Elizabeth Hospital (QEH), clinicians, medical professionals, civil society organisations and researchers with key information on the national burden of stroke and heart attack. The rationale for the collection of the data by the Barbados National Registry for the past 15 years has been to provide data which could have a positive impact on decision-making to improve the care and management of these diseases. In the last three reports, the BNR has utilised the American Heart and the American Stroke Association performance metrics indicators to review the success of the health system in providing care for MIs and strokes. This report compares the last ten years of data from 2013 to 2022.

HEART ATTACKS

Burden- Number of cases, incidence, mortality, gender differences and comparison with previous years

Number of cases and crude incidence rates

The number of heart attacks (acute MIs) registered in 2022 were 556. This was an increase compared to previous years (Figure 1.1). Crude incidence increased from 166 per 100,000 in 2021 to 198 per 100,000 in 2022.

Figure 0.1: Number of men and women with acute MI by year in Barbados, 2013 - 2022

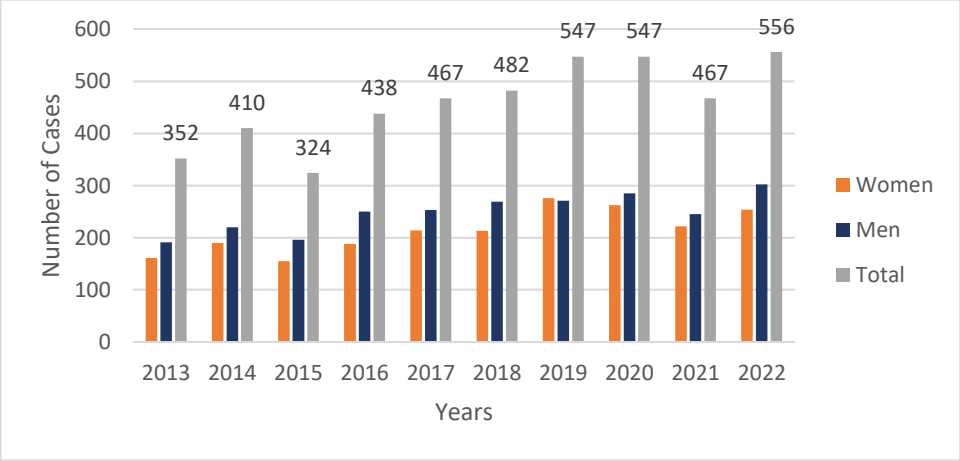
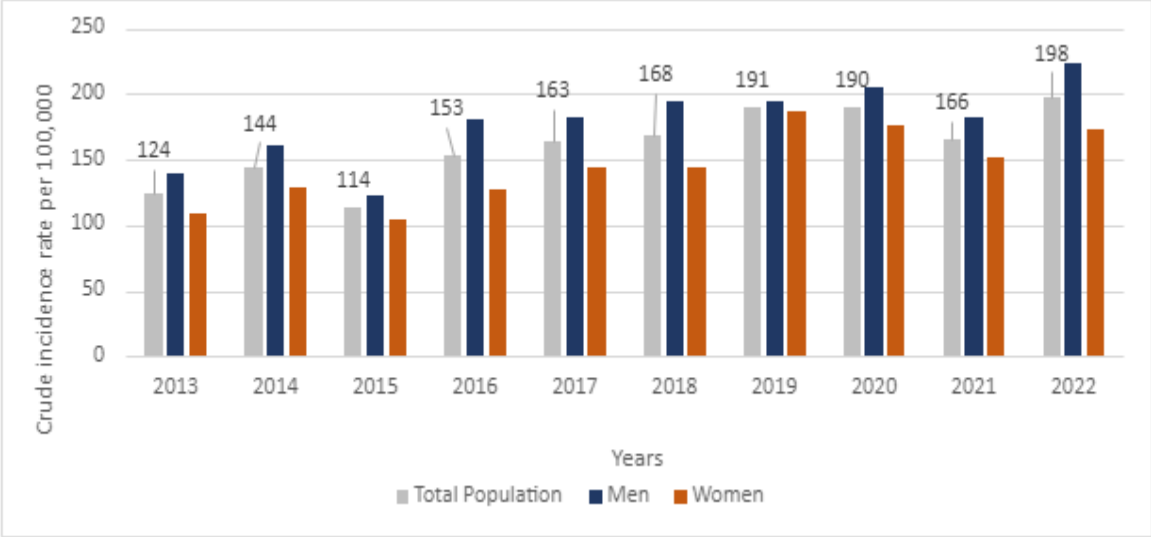


Figure 0.2: Crude incidence rate of men and women per 100,000 population with acute MI by year in Barbados. 2013 – 2022



Age-standardised Incidence and Mortality Rates (ASIR, ASMR)

The age-standardised incidence (Figure 1.3), showed an increase over the period of review. This is reflected in Table 1.2 which provides values for the age-standardised incidence and mortality rates from 2013 – 2022. In 2022, the age-standardised incidence is 146 per 100,00 in men and 89 per 100,000 in women.

Figure 0.3: Trends in age-standardised incidence rates of men and women with acute MI or sudden cardiac death by year in Barbados, 2013 - 2022

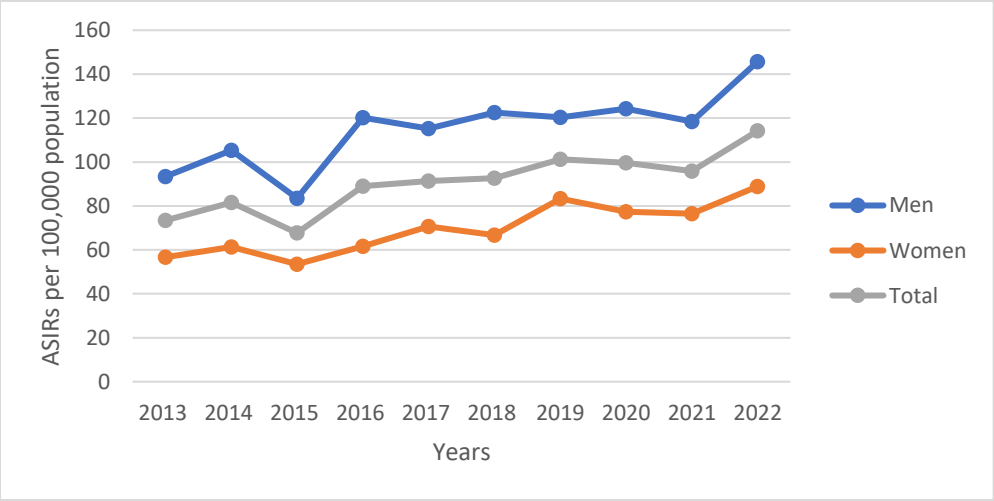


Table 0.1: Age-standardised incidence and mortality rates of men and women with acute MI or sudden cardiac death by year in Barbados, 2013 - 2022

	Men				Women			
	Cases	**%**	**ASIR**	**95% UI***	**Cases**	**%**	**ASIR**	**95%UI***
2013	191	54	93	80 - 108	161	46	57	28 - 67
2014	220	54	105	92 - 121	190	46	61	52 - 72
2015	169	52	84	71 - 98	155	48	54	45 - 64
2016	250	57	120	105 - 137	188	43	62	52- 72
2017	253	54	115	101 - 131	214	46	71	61 - 82
2018	269	56	122	108- 139	213	44	67	57 - 77
2019	271	50	120	106- 136	276	51	83	73 - 95
2020	285	52	124	110 - 140	262	48	77	67 - 89
2021	245	53	118	104 - 135	222	48	77	67 - 89
2022	302	54	146	105 - 124	254	46	89	78 - 101
Years	**Men**				**Women**			
	Deaths	**%**	**ASMR**	**95% UI**	**Deaths**	**%**	**ASMR**	**95%UI**
2013	120	51	56	46 - 68	117	49	38	31 – 47
2014	130	52	59	49 - 71	118	48	34	27 - 42
2015	78	50	35	28- 45	79	50	24	19 - 31
2016	147	57	66	56 - 79	113	44	33	27 - 40
2017	136	55	59	49 - 70	110	45	31	25 - 39
2018	152	53	66	56 - 78	136	47	40	33 - 48
2019	145	47	61	51 - 73	163	53	45	38 - 54
2020	158	49	66	56 - 78	166	51	45	38 - 54
2021	167	50	78	67 - 91	168	50	55	47 - 65
2022	206	52	98	85 - 113	189	48	64	55 - 74

*95% UI – These stand for 95% uncertainty intervals and indicates the level of random error we expect around or estimates. These intervals indicate that even though our best estimate for is stated, the actual rate will fall between the listed range. For example, if the ASIR for 2010 is 77, we are 95% confident that the ASIR rates for 2010 fall between 69.0 and 86.4.

Age and Gender Stratified Incidence Rates

The age and gender stratified case counts continue to show higher number of cases of heart attacks in men in the 55 – 74 age group, whereas the peak number of cases for women is in the 85 & over age group.

Figure 0.4a: Number of new cases by age and gender of acute MI, Barbados, 2022 (N=556) (10 year bands)

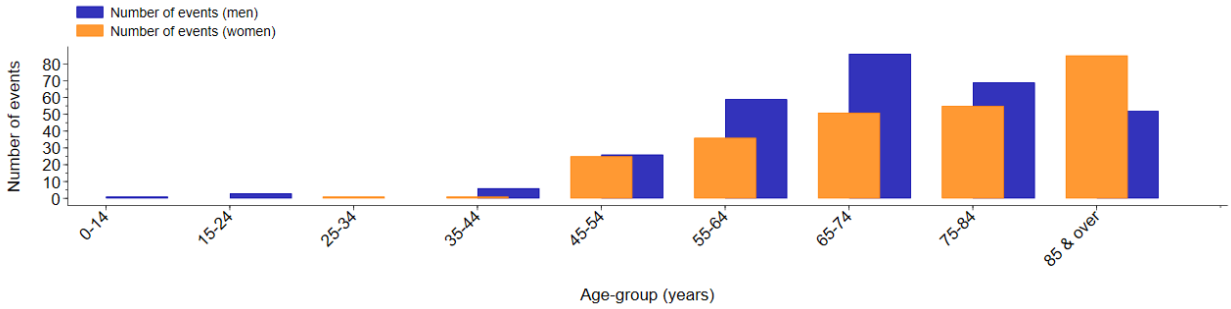
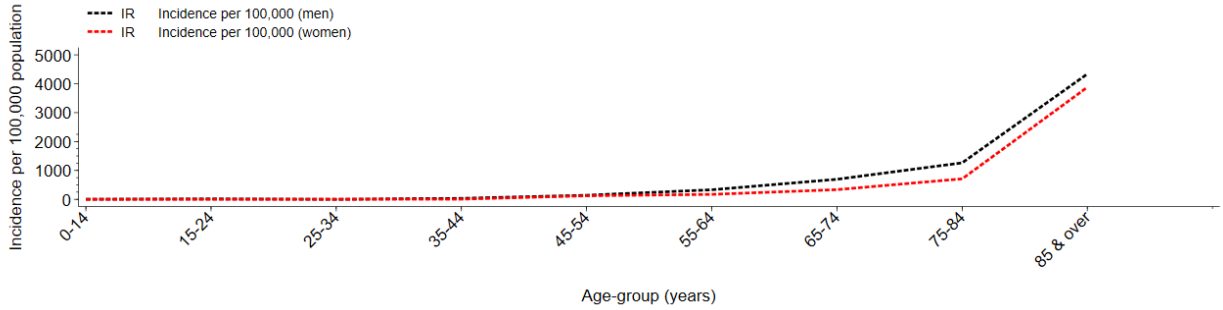


Figure 0.5b: Age and gender stratified incidence rate per 100,000 population of acute MI, Barbados, 2022 (N=556) (10 year bands)

,



Symptoms and Risk Factors of Acute MI

The American Heart Association (AHA)/American Stroke Association (ASA) describes chest pain due to ischemic heart disease primarily as central, pressure, squeezing, gripping, heaviness, tightness, exertional/stress related or retrosternal.[2] Table 1.3 shows the main presenting symptoms and signs of Acute MI in men and women.

[2] 2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines,2021. Circulation

Table 0.2: Main presenting symptoms and signs of acute MI patients in Barbados, Jan–Dec 2022 (N=208)

Symptom/Signs	Women (90)		Men (118)		Total (208)	
	Number	%	Number	%	Number	%
Chest pain	62	69	86	73	148	71
Shortness of breath	44	49	46	39	90	43
Sweating	31	34	52	44	83	40
Sudden vomiting	22	24	25	21	47	23
Light-headedness, nausea/malaise	25	28	29	25	54	26
Palpitations	20	22	20	17	40	19
Sudden dizziness/vertigo	16	18	17	14	33	16

Notes 1: Women - The number and percentage of women with a given symptom as a % of the number of women with information for a specific year.

Men –The number and percentage of men with a given symptom as a % of the number of men with information for a specific year.

Totals –The total number and percentage of patients (men & women) with a given symptoms as a % of all patients with information for a specific year.

Risk Factors associated with AMI

Hypertension and diabetes are the most prevalent risk factors documented among those hospitalised with AMI in 2022.

Table 0.3: Prevalence of known risk factors among hospitalised acute MI patients, 2022 (N=207)

Risk Factor Type	Risk factor	Number	%
Prior CVD event/disease	Prior acute MI	28	14
	Prior stroke	24	12
Current co-morbidity	Hypertension	134	65
	Diabetes	97	47
Lifestyle-related	Alcohol use	38	18
	Smoking	20	10

Notes 2: Due to changes in the data collection form, this has led to missing data to be classified as "no", which differs from previous years. This change has thus decreased the proportion of persons identified for reporting a risk factor and may underestimate the prevalence of a risk factor for this cardiovascular outcome.

e368-e454,144,22.doi:10.1161/CIR.0000000000001029.
https://www.ahajournals.org/doi/abs/10.1161/CIR.0000000000001029

Mortality

Secular trends in case fatality rates for AMI

Each case of myocardial infarction is followed to determine vital status at discharge, 28 days and one year. In addition, registry personnel visit the death registry to collect data on all sudden cardiac and AMI deaths. The 28-day or 30-day case fatality rates considered a quality indicator.

Table 0.4: Mortality statistics for MI patients in Barbados, 2013 - 2022

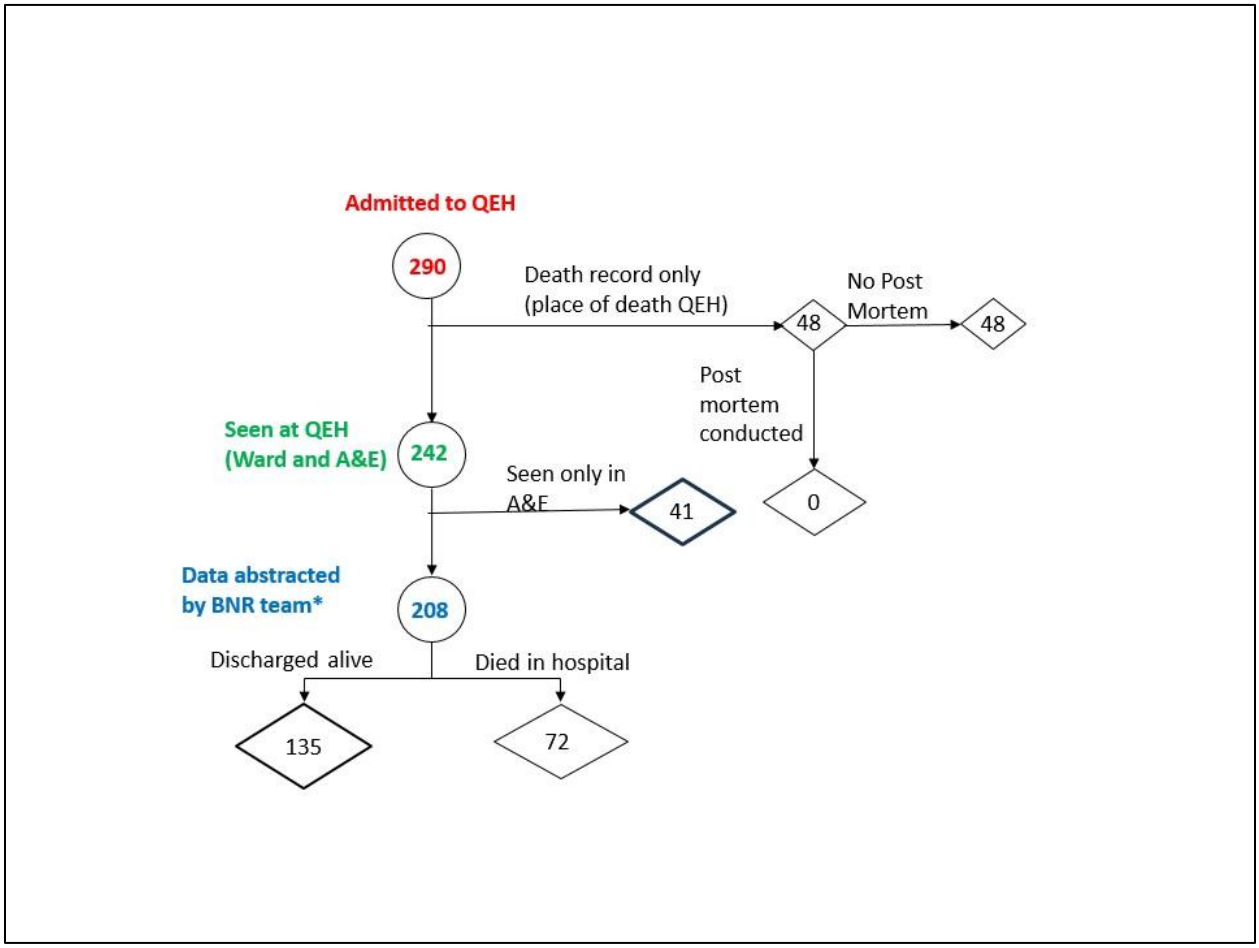
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Number of BNR Registrations	352	410	324	439	467	483	547	547	467	556
Number of hospitalised cases (A&E + WARD)	178	255	232	249	301	288	342	338	201	290
Number of cases with full information*	153	234	209	217	278	257	311	291	185	208
In-hospital CFR (Clinical), n (%)**	38 (25%)	72 (31%)	42 (20%)	38 (18%)	57 (21%)	62 (24%)	72 (23%)	68 (23%)	62 (34%)	72 (35%)
Total hospitalised deaths, n (%) (A&E + WARD)	63 (35%)	93 (36%)	65 (28%)	70 (28%)	80 (27%)	93 (32%)	103 (30%)	115 (34%)	62 (31%)	72 (30%)
Case fatality rate at 28 days***	43%	43%	35%	32%	31%	39%	35%	27%	36%	31%

*Notes 3: *Cases where the patient note was seen and the BNR team was able to summarise all the data needed (a full abstract)*
*** Cases which followed the clinical definition of an MI (see Appendix)*
****Case fatality rate in hospital and post discharge for hospitalised cases that were fully abstracted*

Focus on acute MI in-hospital outcomes

The figure below (Figure 1.5) demonstrates the vital status and outcomes of persons hospitalised with heart attacks (AMI) in 2022, with information documented in the notes. Of those hospitalized and who have full information indicating they meet the definition of AMI, 65% were discharged alive. The remainder were diagnosed by death certificate or died in hospital with a diagnosis of heart attack or sudden cardiac death.

Figure 1.5: Flow-chart of vital status of acute MI patients admitted to the Queen Elizabeth Hospital in Barbados, 2022



*NB: 1 Unknown status

Performance measures for Acute Myocardial Infarction, 2022

The American College of Cardiology (ACC)/ American Heart Association (AHA) has developed a set of key performance indicators that capture important aspects of quality of care including timeliness, effectiveness, efficiency, and patient-centeredness. In 2017, the ACC/AHA identified seventeen reporting measures that hospitals may use to assess their performance as it relates to the management of ST-elevation myocardial infarction (STEMI) and Non-ST elevation myocardial infarction (NSTEMI). Based on the data collected by the Barbados National Registry, we report on six of these performance measures for the hospital cases which had full information below.

The first three performance measures (PM) focus on management in the acute phase (first 24 hours), while the remaining three focus on management at discharge. The performance measures are

1. Proportion of patients with MI receiving aspirin in first 24 hours
2. Proportion of STEMI patients who received reperfusion via fibrinolysis
3. Median reperfusion times
4. Proportion of MI patients receiving an ECHO before discharge
5. Proportion of patients who are prescribed aspirin as a discharge medication
6. Proportion of patients who are prescribed aspirin as a discharge medication

Performance measures for acute care

PM 1: Documented aspirin use within the first 24 hours.

Typically, the AHA Get with the Guidelines Program (GWGT) recognizes performance of 85% or greater compliance on each performance measure. Standards of care guidelines recommend that patients with acute myocardial infarction receive aspirin within the first 24 hours of arrival at hospital or first onset of symptoms (see Appendix C- Descriptions). In Barbados, in 2022, of the 208 cases that were fully abstracted, 124 (60%) were documented as having received aspirin within the first 24 hours of arrival at hospital.

PM 2: Proportion of STEMI patients who received reperfusion via fibrinolysis.

Table 1.6 compares the reperfusion rates for persons admitted to the hospital for heart attack. Of the 208 hospitalised cases with full information in 2022, 70 persons were diagnosed with a STEMI of which 46% were reperfused. (enzymes to restore blood flow, see Appendix C – Descriptions). Fibrinolytic drugs are used for reperfusion in Barbados since Primary Percutaneous Intervention was not routinely available up to and including 2022.

Table 0.5: Number of STEMI cases and proportion reperfused by gender

Year	Women		Men		Total	
	Reperfused (%)	n	Reperfused (%)	n	Reperfused, (%)	n
2018	11 (33)	33	31 (52)	59	42 (46)	92
2019	11 (26)	42	33 (45)	74	44 (38)	116
2020	12 (36)	33	36 (51)	70	48 (47)	103
2021	7 (26)	27	22 (47)	47	29 (39)	74
2022	9 (32)	28	23 (55)	42	32 (46)	70

PM 3: Median time to reperfusion for STEMI

"Door-to-needle" time was available for patients who received thrombolysis (to restore normal blood flow, see Appendix C – Descriptions). To assess whether the patient can receive fibrinolysis, an ECG is critical in the assessment and categorisation of events as either N-STEMI or STEMI. The ACC/AHA recommended time from first medical contact to ECG is less than 10 minutes while fibrinolysis should occur within 30 minutes of first medical contact. In 2022, no patients registered with acute myocardial infarctions received an ECG within this 10 minute time frame.

Table 0.6: 'Door to needle' times for hospitalised patients

Years	Median time from scene to arrival at A&E	Median time from admission to first ECG	Median time from admission to fibrinolysis	Median time from onset to fibrinolysis
2018	19 minutes	53 minutes	107.5 minutes or 1 hour and 48 minutes	279 minutes or 4 hours and 39 minutes
2019	20 minutes	46 minutes	143 minutes or 2 hours and 23 minutes	311 minutes or 5 hours and 11 minutes
2020	20 minutes	63 minutes or 1 hour and 3 minutes	102 minutes or 1 hour and 42 minutes	318 minutes or 5 hours and 18 minutes
2021	21 minutes	62 minutes or 1 hour and 2 minutes	94 minutes or 1 hour and 34 minutes	290 minutes or 4 hours and 50 minutes
2022	19 minutes	106 minutes or 1 hour 46 minutes	125 minutes or 2 hours 5 minutes	327 minutes or 5 hours 27 minutes

Performance measures related to discharge

PM 4: Proportion of patients receiving an echocardiogram before discharge.

The ACC/AHA recommends that patients receive an evaluation of left ventricular ejection fraction (LVF) after a myocardial infarction, assessed at a standard for 85% completion. The BNR assessed this by reviewing the proportion of patients who received an echocardiogram (see Appendix C – Descriptions) before discharge. Registry records indicate that in 2022, of the patients alive at discharge (135), 52.6% had received an echocardiogram before leaving hospital (compared to 36% in 2021) while an additional 28.9% had been referred for the procedure as an outpatient. A higher proportion of men have echocardiograms before discharge compared to women. A higher proportion of men received echocardiograms than women.

Table 0.7: Proportion of patients receiving echocardiogram, 2022

Year	Timing	Women(n=51)		Men (n=84)		Total(n=135)	
		Number	%	Number	%	Number	%
2022	Before discharge	23	45.1	48	57.1	71	52.6
	Referred to receive after discharge	21	41.2	18	21.4	39	28.9

Notes 4: Of the persons who were alive at discharge (n=135), 71 (52.6%) persons had an echo before discharge and 39 (28.9%) persons were referred to receive after discharge.

Of the males that were alive at discharge(n=84), 48 (57.1%) had an echo before discharge and 18 (21.4%) were referred to receive after discharge.

Of the females that were alive at discharge (n=51), 23 (45.1%) had an echo before discharge and 21 (41.2%) were referred to receive after discharge.

PM 5: Documented aspirin prescribed at discharge.

Aspirin is critical for secondary prevention of MIs and it is expected that all eligible patients receive this medication on discharge. In 2022 at QEH, aspirin was prescribed to 96% of heart attack patients at discharge. Data to account for persons discharged on antiplatelets and chronic users of aspirin has been used to calculate what is believed to be an accurate representation of this metric in Table 1.8 below.

Table 0.8: Proportion of patients receiving antithrombotic therapy at discharge*

Year	Aspirin at Discharge	Patient Receiving any Antiplatelets	Total Alive	Percentage Receiving Therapy
2018	159	187	194	96%
2019	180	221	234	94%
2020	184	193	222	87%
2021	101	111	123	90%
2022	111	129	135	96%

*Notes 5: * Aspirin/Antiplatelet therapy includes those prescribed aspirin at discharge, those not discharged on aspirin but discharged on antiplatelets and those chronically on aspirin.*

PM 6: Documented statins prescribed at discharge.

ACC/AHA recommends that all MI patients be discharged home with a high intensity statin, but the dose and frequency were not collected by the registry and thus the proportion of these which were high intensity could not be evaluated. In 2022, 73% of patients were discharged home on a statin compared to 82% in 2020 and 77% in 2021.

STROKE

Burden- Number of cases, incidence, mortality, gender differences and comparison with previous years

Number of cases and crude incidence rates

There were 765 strokes registered in 2022; 452 admitted to hospital and 199 registered via death certificates(Figure 2.1). The crude incidence was similar in men and women (Figure 2.2).

Figure 0.1: Number of men and women with stroke by year in Barbados. 2013 - 2022

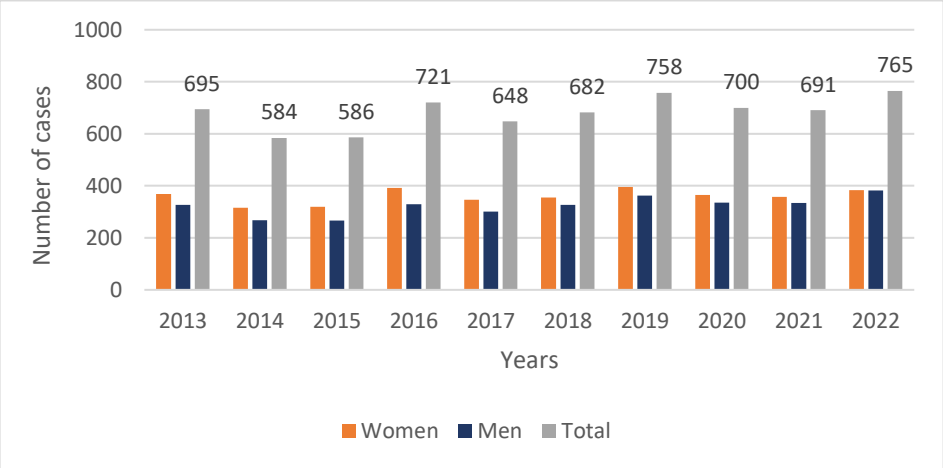
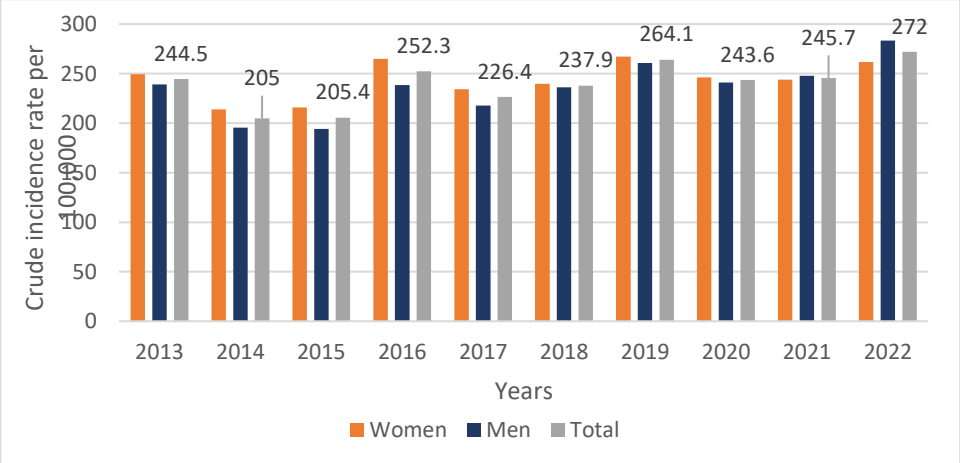


Figure 0.2: Crude incidence of men and women with stroke by year in Barbados. 2013 - 2022



Age-standardised Incidence and Mortality Rates (ASIR, ASMR)

The age-standardised incidence trends are shown in Figure 2.3 The complete list of the ASIRs from 2013 – 2022 is listed in Table 2.1. Figure 2.3 compares the age-standardised incidence to age-standardised mortality over the same period. The ASIRs and ASMRs for 2022, represent the highest recorded rates registered by the Barbados National Registry in the fourteen years of reporting on cardiovascular disease.

Figure 0.3: Trends in age-standardised incidence and mortality rates of stroke per 100,000 population by gender, Barbados 2013 -2022

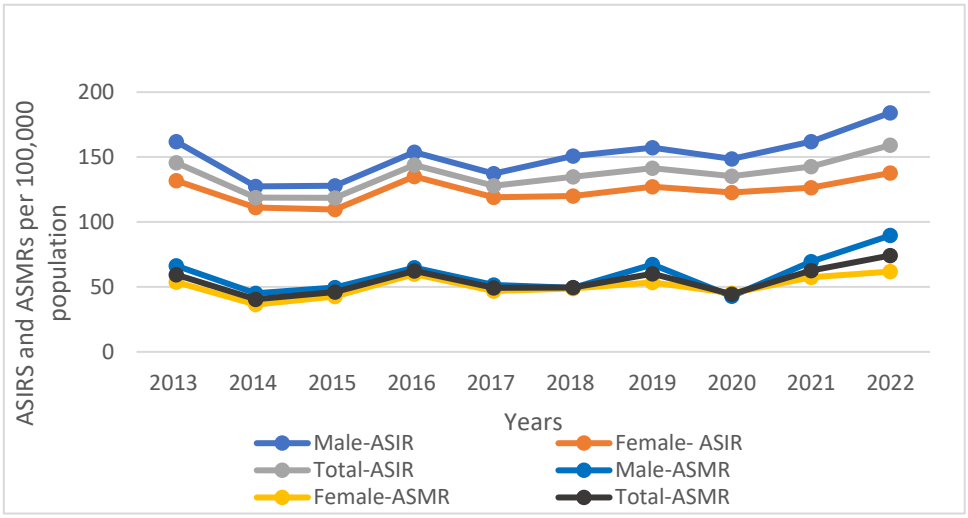


Table 0.1: Age-standardised incidence and mortality rates of men and women diagnosed with stroke by year in Barbados, 2013 - 2022

Years	Men				Women			
	Cases	%	ASIR	95% UI	Cases	%	ASIR	95%UI
2013	327	47	162	144- 181	368	53	132	118- 148
2014	268	46	127	112 - 144	316	54	111	98 - 126
2015	267	46	128	113 - 145	319	54	110	97 - 124
2016	329	46	154	137 - 172	392	54	135	121 - 151
2017	301	47	137	123 - 154	347	54	119	106 - 134
2018	327	48	151	134 - 169	355	52	120	107 - 135
2019	362	48	157	141 - 175	396	52	127	114 - 142

2020	335	48	149	133 - 166	365	52	123	109 - 138
2021	334	48	162	145 - 181	357	52	127	113- 142
2022	382	50	184	166 - 204	383	50	138	124 - 153
Years	**Men**				**Women**			
	Death	**%**	**ASMR**	**95% UI**	**Death**	**%**	**ASMR**	**95%UI**
2013	147	45	66	56 - 78	177	55	54	45 - 64
2014	106	46	45	37 - 55	127	55	36	30 - 44
2015	112	44	50	41- 60	143	56	43	35- 51
2016	152	43	65	55 - 77	204	57	60	51 - 70
2017	121	44	52	43 - 62	153	56	47	39 - 56
2018	114	40	49	41 - 60	170	60	49	41 - 58
2019	166	46	67	57 - 79	198	54	53	46 - 62
2020	103	42	43	35 - 53	143	58	45	37- 55
2021	144	45	70	59 - 82	176	55	57	49 - 67
2022	183	49	90	77- 104	189	51	62	53 - 72

Age and Gender Stratified Incidence Rates

As in previous years, we observed that more men than women have strokes in the 55 – 64 and the 65 – 74 age groups, whereas in older age groups, numbers of cases are higher in women (Figure 2.4). The age-specific incidence is similar in men and women at all age groups (Figure 2.5).

Figure 0.4: Number of new stroke cases by age-group and gender, Barbados, 2022 (N=765)

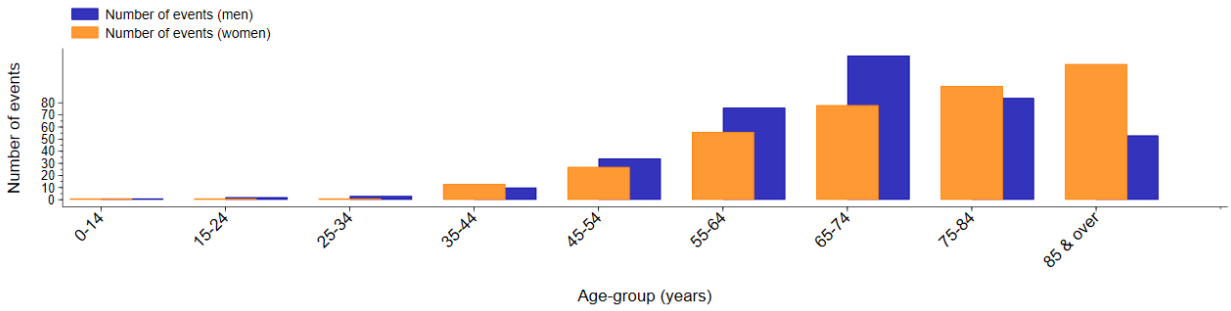
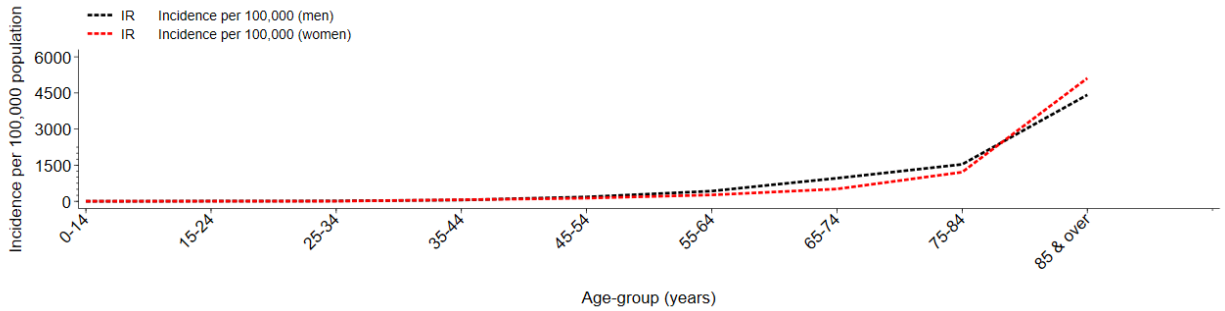


Figure 0.5: Incidence rate of stroke per 100,000 population by age-group and gender, Barbados, 2022 (N=765)



Stroke Subtypes

Over 80% of strokes in Barbados are ischaemic strokes, less than 20% are intracerebral haemorrhage and less than 5% are subarachnoid haemorrhage (Table 2.2). In most years a small proportion of strokes remain unclassified.

Table 0.2: Stroke subtypes in Barbados, 2019 - 2022

Stroke Subtypes	2019 (622)		2020 (563)		2021 (500)		2022 (499)	
	Women, N (%)	Men, N (%)	Women, N (%)	Men, N (%)	Women, N (%)	Men, N (%)	Women, N (%)	Men, N (%)
Ischaemic stroke	266 (83)	247 (81)	244 (85)	229 (83)	203 (81)	216 (87)	208 (84)	211 (84)
Intracerebral haemorrhage	26 (8)	37 (12)	35 (12)	43 (16)	35 (14)	25 (10)	29 (12)	34 (14)
Subarachnoid haemorrhage	10 (3)	4 (1)	6 (2)	3(1)	11 (4)	6 (2)	9 (4)	3 (1)

Symptoms, Signs and Risk Factors of Stroke

Table 2.3 outlines the proportion of patients who displayed the more common presenting signs and symptoms associated with stroke. Documentation of the symptoms, signs and risk factors, have decreased. The percentage distribution of the symptoms/signs in men and women remains similar to 2020.Diminished responsiveness is used to characterise any drowsiness, temporary loss of consciousness or coma.

Table 0.3: Main presenting symptoms for stroke patients in Barbados, Jan–Dec 2022 (N=499)

Symptoms/Signs	Women (248)		Men (251)		Totals (499)	
	Number	%	Number	%	Number	%

Unilateral Weakness	182	73	176	70	358	72
Difficulty speaking	139	56	144	57	283	57
Diminished responsiveness	72	29	57	23	129	26
Headache	52	21	33	13	85	17
Difficulty or inability to swallow	10	4	10	4	20	4

Notes 6: Women - The number and percentage of women with a given symptom as a % of the number of women with information for a specific year.
Men - The number and percentage of men with a given symptom as a % of the number of men with information for a specific year.
Totals –The total number and percentage of patients (men & women) with a given symptom as a % of all patients with information for a specific year.

Risk Factors

Of the commonly documented risk factors for the occurrence of a stroke hypertension and diabetes remain the most prevalent risk factors in patients diagnosed with stroke. Hypertension continues to be the leading risk factor for hospitalised stroke patients.

Table 0.4:Prevalence of known risk factors among hospitalised stroke patients, 2022 (N=494)

Risk factor type	Risk factor	Number	%
Prior CVD event/disease	Prior stroke or TIA	115	23
	Prior/current IHD/CVD/PVD/acute MI	25	5
Current co-morbidity	Hypertension	359	73
	Diabetes	179	36
Lifestyle-related	Alcohol use	86	17
	Smoking	36	7
Family history of stroke	Mother, father, or sibling	22	4*

*Notes 6: *Denominator - 494*

Mortality

Secular trends in Stroke Mortality

The case fatality rates (CFR), the percentage of persons who died of stroke in hospital was 25%, while the total case fatality for stroke at 28-days (for both in-hospital and discharged) was 22%.

Table 0.5: Mortality statistics for stroke patients in Barbados, 2013 - 2022

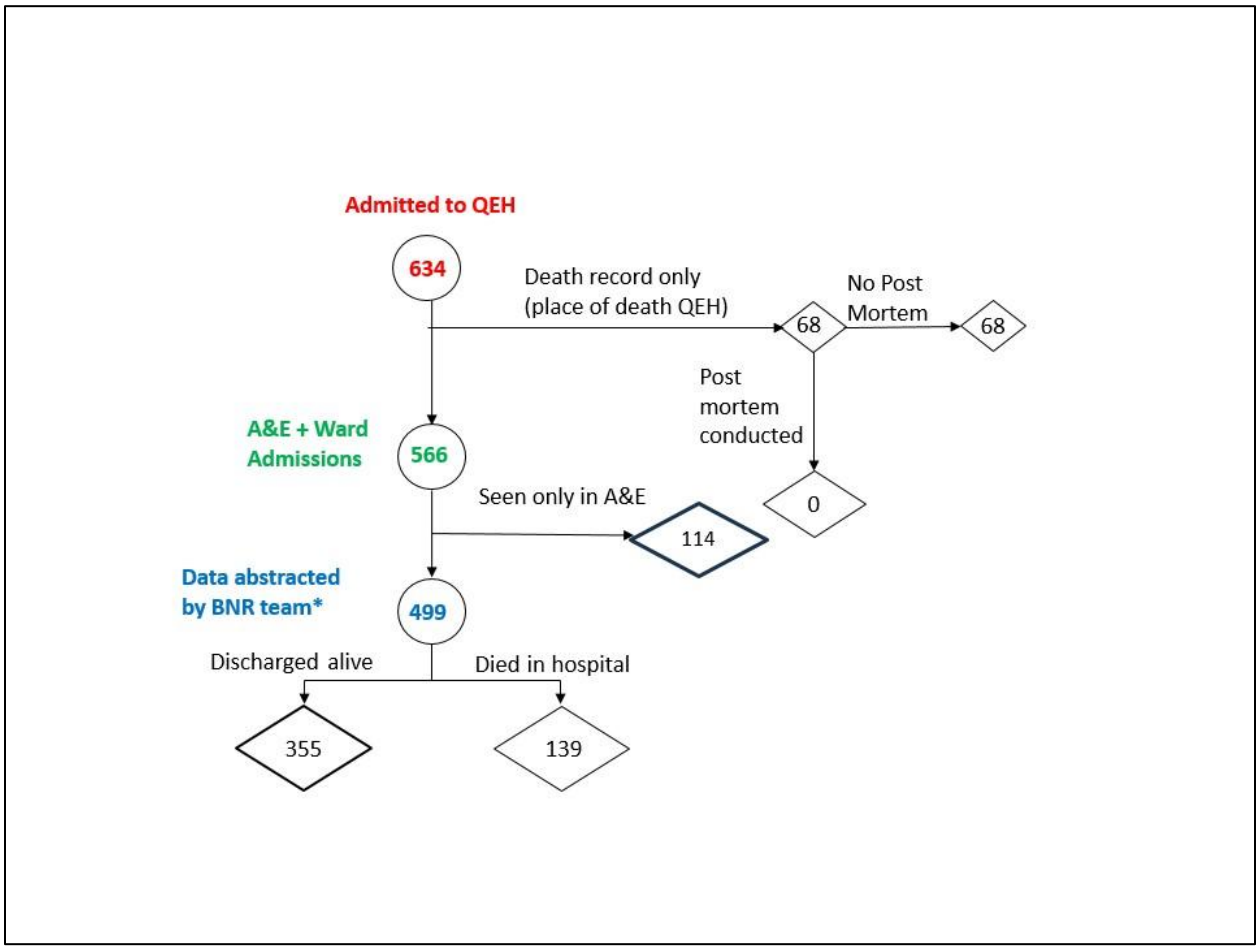
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total Cases	695	584	586	723	650	682	758	700	691	765
Cases with full information	544	481	484	563	544	550	622	563	500	499
In-hospital CFR (of cases with full information)	173 (31%)	130 (27%)	153 (31%)	198 (35%)	170 (31%)	152 (28%)	228 (37%)	177 (31%)	151 (30%)	139 (28%)
Case fatality rates at 28 days*	36%	30%	43%	28%	32%	25%	32%	43%	28%	22%

*Notes 7: *Case fatality rate in hospital and post discharge for hospitalised patients*

Focus on stroke in-hospital outcomes

Figure 2.6 depicts the outcomes of the patients hospitalised with stroke in 2022. Of those with information, 355 were discharged alive (63%) and 139 died in hospital. The case fatality rate (CFR)at 28 days has decreased from 28% in 2021 to 22% in 2022.

Figure 0.4: Flow-chart of vital status of stroke patients admitted to the Queen Elizabeth Hospital in Barbados, 2022



*NB: 5 Unknown vital status

Performance measures for stroke, 2022

The American Heart Association's collaborative performance improvement programme has developed a set of measures to help hospitals managing stroke patients to assess the extent to which they adhere to evidenced-based approaches and thus promote changes that improve patient outcomes. The data collected by the BNR is suitable for the assessment of acute ischaemic strokes which constitute approximately 84% of strokes registered. The management of ischaemic stroke involves multiple dimensions of care (including acute treatment, prevention of recurrence, prevention and treatment of

common medical complications, rehabilitation, and patient education and counselling) that cut across multiple healthcare disciplines (e.g., physicians, nurses, therapists, and others) and across multiple healthcare settings (e.g., outpatient, acute care hospital, and inpatient rehabilitation).

Below we use data from the registry to report on measures in both the acute and discharge phases of management, the recommendation is that hospitals achieve 85% compliance with each performance measure[3].

Performance measures for acute care

PM 1: Proportion of patients receiving reperfusion

With the opening of the Stroke Unit in 2015, the Queen Elizabeth Hospital was able to offer IV TPA (*a "clot busting" drug – see Appendix C*) to patients arriving within 2 hours of onset of symptoms. Before 2021 an annual average of 11 people were reperfused (2.5%), however only 6 persons were reperfused in each year of 2021 and 2022 (1.4% of cases).

PM 2: Proportion of patients with ischaemic stroke who receive anti-thrombotic therapy while in hospital

We calculated the proportion of persons with ischaemic stroke who received anti-thrombotic therapy (*see Appendix C for definition, e.g., warfarin, aspirin or clopidogrel*) before leaving hospital. Approximately 63% of women and 67% of men received anti-thrombotic therapy in 2022 (Table 2.6).

Table 0.6: Proportion of persons with acute ischaemic events receiving anti-thrombotic therapy by year

Years	Anti-thrombotics			
	Men		Women	
	Number	%	Number	%
2019	183	74	182	68
2020	188	77	178	78
2021	139	68	153	71
2022	141	67	132	63

Performance measures related to discharge.

[3] Get With The Guidelines® - Stroke Recognition Criteria, Achievement Awards - https://www.heart.org/en/professional/quality-improvement/get-with-the-guidelines/get-with-the-guidelines-stroke/get-with-the-guidelines-stroke-recognition-criteria

PM 3 & PM 4: Percent of patients with an ischaemic stroke prescribed anti-thrombotic therapy at discharge and Statin Prescribed at Discharge: Percent of ischaemic stroke who are discharged on Statin medication

Table 2.7 shows the proportion of men and women who received anti-thrombotic therapy and statins at discharge from 2018 - 2022.

Table 0.7: Proportion of ischaemic stroke cases receiving appropriate medications at discharge

Years	Anti-thrombotics				Statins			
	Men		Women		Men		Women	
	Number	%	Number	%	Number	%	Number	%
2018	125	80	146	76	113	72	133	70
2019	143	83	136	80	126	73	112	66
2020	123	78	141	80	109	69	136	77
2021	111	77	133	82	108	74	126	77
2022	128	79	110	72	125	77	112	73

BNR Professional and Public Engagement

Update on the professional and public engagement events involving the BNR in 2022.

Media engagement

- *Heart attacks and strokes still leading causes of death* Article by Barbados Today Online based in CVD Report, 2nd March 2022 https://barbadostoday.bb/2022/03/02/heart-attacks-and-strokes-still-leading-causes-of-death/

- Attack on NCDs to be ramped up, Barbados Today, March 4th, 2022, https://barbadostoday.bb/2022/03/04/attack-on-ncds-to-be-ramped-up/

- UWI expert suggests COVID-style info dashboard on NCDs https://barbadostoday.bb/2021/03/05/uwi-expert-suggests-covid-style-info-dashboard-on-ncds/

- Cardiovascular Diseases No.1 Cause Of Death, 21th March 2022 GIS - https://gisbarbados.gov.bb/blog/cardiovascular-diseases-no-1-cause-of-death/

- *Landis' Vision Clear for UWI* 'GACDRC has a strong track record in undertaking population-based epidemiological research, focusing on surveillance of CNCD incidence, prevalence and risk factors.', Nation Newspaper, page 13A, May 29th, 2022

- *Statistics of heart attacks and strokes alarming, June 1, 2022* Nation Newspaper, page 4.

- Barbados records 10 hearts attacks a week, two strokes per day – BarbadosToday, June 1, 2022

- https://barbadostoday.bb/2022/06/01/barbados-records-10-hearts-attacks-a-week-two-strokes-per-day/

Presentations at Regional conferences

- Carter, F, Jones, W, Sobers, NP. “Uncovering the driving forces behind the trend in coronary heart disease mortality in Barbados from 2009–2018.” West Indian Medical Journal, Vol 70 (Suppl 1): 1–61. Presented at the 66th Annual CARPHA Health Research Conference, Virtual, 0915-1722
- Forde, S. “The Barbados National Registry and National NCD Surveillance”, CARPHA meeting on Integrated Multifaceted Surveillance Systems Towards Regional Health Security, a session titled: “NCD surveillance for Epidemiologists”, Virtual Presentation, July 20, 2022
- Sobers, N.P. "Predictors of 30-day mortality for stroke". Presented at The UWI Continuing Medical Education Series 2022, Virtual, 102922

Appendices

Appendix A- Methods

The BNR collected data from both hospital and community sources. The Queen Elizabeth Hospital (QEH) is Barbados' only public tertiary care institution and as such, a large proportion of individuals who present with stroke and acute myocardial infarction (AMI) are managed in this facility. It is standard practice for cardiovascular events managed initially at other healthcare facilities to be transported by ambulance to the QEH for additional care.

The methodology of data collection was modified due to the COVID-19 protocols at the Queen Elizabeth Hospital, which restricted the data abstractors' access to the hospital wards. In 2022, data abstractors collected information from three sources within the Queen Elizabeth Hospital:

a) Accident and Emergency Records
b) Death Records
c) Medical Records

Data abstraction in the hospital specifically included the collection of additional information on the symptoms, treatment, vital status, risk factors and associated morbidities for anyone diagnosed with a heart attack or stroke. Information regarding the case history of individuals admitted to hospital was also obtained from chart review.

Out-of-hospital deaths and in-hospital deaths within 24 hours were identified through the national vital registration department by checking all death certificate diagnoses that list any form of ischemic heart disease (IHD) as the main cause of death.

We calculated incidence rates using the United Nations World Population estimates for 2021 as the denominator and performed age-standardisation to the WHO World 2000 population.

Appendix B — Acknowledgements

This report was prepared by the Barbados National Registry for Chronic Non-communicable Disease (BNR), headquartered at the George Alleyne Chronic Disease Research Centre (GA-CDRC), The University of the West Indies. The BNR is a Ministry of Health and Wellness initiative, providing surveillance of the three principal causes of ill-health and death among Barbadians: stroke, myocardial infarction (heart attacks) and cancer.

We gratefully acknowledge all patients with myocardial infarction and strokes and their families who have contributed to the BNR-CVD. This surveillance system is made possible by the physicians, nursing staff, administrative staff and ancillary personnel of the Queen Elizabeth Hospital, Bayview Hospital, parish polyclinics, geriatric, and district hospitals, as well as private physicians, diagnostic establishments, and emergency clinics across the island. Their essential collaboration helps to bring ongoing improvements in stroke and myocardial infarction surveillance.

Contributors: BNR-CVD Surveillance Team (2022)

Dr Natasha Sobers, Head of NCD Surveillance, GA-CDRC (2018 - present)
Mrs. Abigail Robinson, Data abstractor, BNR-CVD
Ms Nicolette Roachford, Data abstractor, BNR-CVD
Mrs. Karen Whittaker, Steno Clerk, BNR
Ms. Stephanie Whiteman, Data Analyst, BNR
Ms. Jacqueline Campbell, Quality Control Coordinator, BNR
Dr Rudolph Delice, Clinical Director, BNR-Heart
Prof. David Corbin, Clinical Director, BNR-Stroke
Prof. Ian R Hambleton, Statistician, GA-CDRC
Prof. Simon G Anderson, Director, GA-CDRC (2019 – present)

Special Thanks
Prof. Sir Trevor Hassell, Chairman, National Chronic Non-communicable Disease Commission
Ms. Nicolai Ifill, Medical Records Dept., Queen Elizabeth Hospital
Mr. Andrew Yearwood, Medical Records Dept., Queen Elizabeth Hospital
Ms. Natalie Lynch, Medical Records Dept., Queen Elizabeth Hospital
Ms. Maria Phillips, Medical Records Dept., Queen Elizabeth Hospital
Mr. Curtis Nurse, Medical Records Dept., Queen Elizabeth Hospital
Mr. Stephen Barrow, Medical Records Dept., Queen Elizabeth Hospital
Ms Marsha Corbin, Medical Records Dept., Queen Elizabeth Hospital
Clerical officers of the A&E Department
Ms Cheryl Knight and the staff of the Registration Department

The Professional Advisory Board of the BNR (2022)

Name	Affiliation
Prof. Sir Trevor Hassell (Chair)	Chairman of the National Commission for Chronic NCDs
Prof. Simon Anderson	Current Director, GA-CDRC
Dr. Patrice Lawrence Williams	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
Mrs. Bynoe-Sutherland	Executive Chair, QEH (ex officio represented by Ms. Lee-Ann Salandy)
Dr Natasha Sobers	Principal Investigator, BNR
Dr Richard Ishmael	Consultant cardiologist, 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
Dr David Gaskin	Consultant Pathologist, QEH
Dr Natalie Greaves	Lecturer, Coordinator, MPhil/PhD Program in Public Health (UWI)
Dr Cheryl Alexis	Lecturer in Clinical Haematology, FMS, UWI; Consultant, QEH
Dr Dawn Scantlebury	Consultant Interventional Cardiologist, QEH
Mrs. Tanya Martelly	Research Manager, GA-CDRC
Mrs. Shelly-Ann Forde	Registrar, BNR

Appendix C — Descriptions

BNR - Heart

The working definition for acute MI in Barbados is based on the current universal and epidemiological definitions endorsed by the ESC, the ACC, the American Heart Association (AHA), and the World Heart Federation (WHF).[4] The elevated cardiac troponin values (cTn) with at least one value above the 99th percentile upper reference limit (URL). The myocardial injury is considered acute if there is a rise and/or fall of cTn values.

[4] Thygesen, K., Alpert J.S., Jaffe, A.S., Chaitman, B.R., Bax, J..J, Morrow, D.A., White, H.D.,: the Executive Group on behalf of the Joint European Society of Cardiology (ESC)/American College of Cardiology (ACC)/American Heart Association (AHA)/World Heart Federation (WHF) Task Force for the Universal Definition of Myocardial Infarction. 'Fourth universal definition of myocardial infarction (2018)'. Circulation. 2018;138:e618–e651. DOI: 10.1161/CIR.0000000000000617

A definite acute MI is defined as: Acute myocardial injury with clinical evidence of acute myocardial ischaemia and with detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL and at least one of the following:

- Symptoms of myocardial ischaemia;
- New ischaemic ECG changes;
- Development of pathological Q waves;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic etiology;
- Identification of a coronary thrombus by angiography or autopsy (not for types 2 or 3 MIs).

Postmortem demonstration of acute atherothrombosis in the artery supplying the infarcted myocardium meets criteria for type 1 MI. Evidence of an imbalance between myocardial oxygen supply and demand unrelated to acute atherothrombosis meets criteria for type 2 MI. Cardiac death in patients with symptoms suggestive of myocardial ischaemia and presumed new ischaemic ECG changes before cTn values become available or abnormal meets criteria for type 3 MI.

Treatment guidelines (acute MI)

Current best practice[5] suggests five oral medications are often given to patients during hospitalization and following discharge with an acute myocardial infarction diagnosis, all with the aim of decreasing mortality and protecting heart muscle:

- Aspirin – to prevent the constricted artery from becoming completely blocked and to lower the risk of another event
- Reperfusion – to open the artery as quickly as possible to restore normal blood flow through fibrinolysis – "clot busting" medications or angioplasty.
- Additional blood thinners (e.g., Clopidogrel), to lower the risk of another event and to prevent clots from building up on stents
- Statins – to lower cholesterol and the risk of another myocardial infarction

BNR-Stroke

The BNR uses the WHO stroke definition of a focal or global neurological impairment of sudden onset, lasting more than 24 hours (or leading to death), and of presumed vascular origin.[6] Global impairment refers to patients with depressed consciousness or coma. The definition excludes coma of systemic vascular origin, transient ischaemic attacks (TIA), subdural haemorrhage, epidural haemorrhage, poisoning, and symptoms of trauma.

[5] World Health Organisation. 'WHO STEPS Stroke Manual: The WHO STEPwise approach to stroke surveillance.' 2006: Geneva, World Health Organisation.

[6] National Institute for Health and Clinical Excellence, 'Stroke: Diagnosis and immediate management of acute stroke and transient ischaemic attack.' (2008) High Holborn: London.

Treatment guidelines (stroke) Current best practice for ischaemic stroke treatment [7]suggests two main medications to be given during hospitalization with the aim of decreasing mortality.

- Thrombolysis is a "clot-busting" drug for urgent clot lysis, within 4.5 hours of symptom onset, to reperfuse – return blood flow to the tissue.
- Anti-thrombotic/ Anti-platelet therapy – to lower risk of a recurrent event: aspirin, or (if intolerant to aspirin) clopidogrel or dipyridamole
- Anti-coagulants/VTE Prophylaxis – used to prevent recurrent embolic stroke, atrial fibrillation, deep vein thrombosis or pulmonary embolus
- Statins – to lower cholesterol and the risk of recurrence: not routine, but recommended if patient already on statins or once not contra- indicated

Appendix D — Glossary of Terms

Age and sex stratified incidence rates: national surveillance data are described by age and gender groupings to give a clinical picture of the distribution of the disease in a country. Review of this information may provide clinically relevant, but not always statistically significant differences.

An age-adjusted rate is a weighted average of the age-specific rates, where the weights are the proportions of persons in the corresponding age groups of a standard population.

Crude and age-standardised incidence rates: to objectively measure the frequency of the disease within the population – incidence is used. It allows the report to state the numbers per a certain amount of the population. Given the significant time that has passed since the national census, we chose to use the United Nation population estimates for the years 2011-2021 for Barbados.

CT (computerised tomography) and **MRI (magnetic resonance imaging)** refer to two of the most common tests which may be used to diagnose a stroke event, and to classify its sub- type.

Incidence rate: 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 would not include recurrences (where recurrence is defined as a presentation to the healthcare system within a certain period of the initiating event).

Intracerebral haemorrhage: Stroke symptoms which may arise from the bleeding from intracerebral arteries.

[7] Adams, H.P. Jr., del Zoppo, G., Alberts, M.J., Bhatt, D.L., Brass, L., Furlan, et al. Guidelines for the early management of adults with ischemic stroke : A guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Athero- sclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Interdisciplinary Working Groups: The American Academy of Neurology affirms the research value of this guideline as an educational tool for neurologists. Stroke. (2007) (38):1655-1711

Ischaemic stroke: Stroke symptoms which are known to originate from an occlusion (blockage) of cerebral arteries.

Subarachnoid haemorrhage: Stroke symptoms which arise from bleeding from intra-cranial arteries, resulting in blood arising between the two membranes which surround the brain.

Mortality rate: A mortality rate is the number of deaths, with the disease (stroke or AMI) as 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.

Number of cases: the overall number of events reported in a country. It can be used to inform the resources required by the health system.

Subarachnoid haemorrhage: Stroke symptoms which arise from bleeding from intra-cranial arteries, resulting in blood arising between the two membranes which surround the brain.

Published by:
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
Email: bnr@cavehill.uwi.edu
Website: www.bnr.org.bb
This report should be cited as:
Sobers N, Forde SA, Campbell JM, Whiteman S, Corbin D, Delice R, Anderson SA, Hambleton I, Cardiovascular Disease in Barbados 2024. The George Alleyne Chronic Disease Research Centre, The University of the West Indies, St Michael, Barbados, July 2024