GOVERNMENT OF BERMUDA

Ministry of Health

Chief Medical Officer's Annual Report 2023:
A Post-Pandemic Focus on Health Inequalities

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Foreword

The publication of an annual report written by a country's Chief Medical Officer or Surgeon General is a longstanding public health tradition across the globe. The purpose of these annual reports is to provide an independent assessment of the state of public health, highlighting issues, which in their opinion, should be the current focus of policy and action to improve the health of the population.

The publication of the Chief Medical Officer's Annual Report in Bermuda has been delayed for several years, partly due to the COVID-19 pandemic, which dominated the attention of all those working in the Ministry of Health.

As we emerge from the pandemic, I am keen to re-establish the Chief Medical Officer's Annual Report on a firm footing. My intent is to publish annually, outlining key public health trends in Bermuda, focused around a central theme.

The theme for my report in 2023 is health inequalities in the post-pandemic era. COVID-19 has enormously impacted health, including its upstream determinants disrupting normal economic and social life. International evidence suggests that COVID-19 is exacerbating underlying health inequalities, which will need to be addressed to prevent COVID-19 from having a long-term scarring effect on our health. I have written this report as a short thematic essay that sits alongside longer, more technical reports such as the *Bermuda Joint Strategic Needs Assessment of Health 2023* and *Health in Review 2023*. The underlying data used to write this report is presented in a supplementary appendix.

I hope you find this year's report helpful in gaining a greater insight into health inequalities in Bermuda and that it helps you understand my priorities as well as the considerable uncertainty surrounding some of the areas of interest.

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Chief Medical Officer

April 2023

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"Of all the forms of inequality, injustice in health is the most shocking and inhumane."

Martin Luther King Jr.[1]

Key Messages:

- Health inequalities result from social inequalities. Action on health inequalities requires action across all the social determinants of health.
- Bermuda continues to show considerable societal inequalities, linked to socioeconomic status, race, sex, and migration status.
- There is a lack of robust, population-wide data on health inequalities, particularly data that can directly link health status with socioeconomic/information on disparities.
- The current health system is a driver of health inequalities. Lack of universal health coverage is resulting in many of those with the greatest health needs being unable to access necessary healthcare.
- COVID-19 is likely to have exacerbated societal and health inequalities, although the full impact of the pandemic remains uncertain.
- Bermuda has a unique opportunity to address health inequalities through the Bermuda Health Strategy 2022-2027 and the planned Universal Health Coverage programme.
- There is a need to develop measurable and objective indices of deprivation and inequalities. This will assess the scale of the issues in Bermuda and monitor progress in addressing the issues.

1 Luther King M. Jr. Presentation at the Second National Convention of the Medical Committee for Human Rights. Chicago, 25 March 1966

Health Inequalities

Health inequalities are defined as "*avoidable, unfair and systematic differences in health between different groups of people*"[2]. This is a broad definition which can be further broken down into inequalities relating to several areas of health:

- Social determinants of health such as income, quality of housing, education
- Health behaviours such as diet and physical activity
- Access to healthcare, such as health insurance status
- Quality and experience of healthcare, which may be related to the level of insurance coverage
- Health outcomes, both disease-specific and global outcomes, such as life expectancy

Research has shown that health inequalities do not only impact those living in income poverty but display what is known as a social gradient in which life expectancy is correlated with an individual's or group's relative socioeconomic position in society[3]. Health inequalities ultimately result from social inequalities.

The social determinants of health, "*non-medical factors that influence health outcomes*", such as an individual's wealth, educational opportunities, social networks, and housing, are not equally distributed throughout society. Whilst many of these factors can be addressed through focused government policy, it should be recognised that these are influenced by wider socioeconomic, environmental, and cultural conditions. From Bermuda's perspective, as a small island state, the social determinants of health will be affected as much by global economic trends as they are by local conditions.

The social determinants will then feed into an individual's health behaviours which can either promote health (e.g. through a balanced diet and physical exercise) or be detrimental to health (e.g. poor diet, physical inactivity, and tobacco smoking). Higher risk health behaviours tend to be associated with lower socioeconomic status.

Finally, lower socioeconomic status can limit access to healthcare, particularly in private insurance-based systems such as Bermuda. Individuals may choose not to seek care due to cost or to delay care, which may inadvertently result in higher healthcare costs for more complex manifestations of conditions. Ultimately, this can result in what is known as the Inverse Care Law, in which people with the greatest health needs are the least likely to receive the necessary healthcare[4].

COVID-19 has exacerbated health inequalities globally. At a macro-level, this has seen populations of wealthier jurisdictions being at lower risk from COVID-19 than the global poor due to better availability of non-pharmaceutical control measures enabled by social protection and access to sophisticated healthcare, coupled with early access to vaccinations and therapeutics[5]. Even within the wealthier jurisdictions, lower socioeconomic classes have been at greater risk from COVID-19 due to increased exposure from frontline work, exacerbated by underlying health risks and challenges in accessing care[6]. Interestingly, the uptake of COVID-19 vaccination has shown a social gradient across a wide range of countries, including Bermuda[7].

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2 Williams E, Buck D, Babalola G, Maguire D. What are health inequalities? 2022. The King's Fund. Available: https://www.kingsfund.org.uk/publications/what-are-health-inequalities

3 Weil AR. Tackling Social Determinants of Health Around The Globe. Health Affairs. 2020;39(7). https://doi.org/10.1377/hlthaff.2020.00691

4 Tudor Hart J. The Inverse Care Law. The Lancet. 1971;297(7696):405-412 https://doi.org/10.1016/S0140-6736(71)92410-X

5 Launch: Special Issue of the International Journal for Equity in Health on COVID-19 and inequality (who.int)

6 McGowan VJ, Bambra C. COVID-19 mortality and deprivation: pandemic, syndemic, and endemic health inequalities. Lancet Public Health. 2022;7(11):e966-e975. https://doi.org/10.1016/S2468-2667(22)00223-7

7 ONS, 2023, Coronavirus and vaccination rates in adults by Socio-demographic characteristic and occupation, England: Dec2020 to March 2023. https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthinequalities/bulletins/coronavirusandvaccinationratesinadultsbysociodemographiccharacteristicandoccupationengland/december2020tomarch2023

Inequalities in Bermuda

Getting a clear picture of health inequalities in Bermuda is far from straightforward. The recent *Bermuda Joint Strategic Needs Assessment of Health* (JSNA) has brought together a broad range of information relating to health and healthcare from across organisations in Bermuda.

In contrast to other high-income jurisdictions, the health information picture in Bermuda is limited in its population coverage and ability to link with other relevant socioeconomic data (such as income or educational attainment) to form a granular view of health inequalities. In fact, on the surface, these inequalities may appear somewhat hidden, especially when much of the information is reliant on insurance data.

Therefore, this report has been developed by linking relevant local data sets with global trends and, where appropriate, using proxy indicators to help build the picture of health inequalities in Bermuda in 2023. Evidently, this approach has limitations. However, it should still give the best picture to date of Bermuda's health inequalities along with making the case for strengthening public health information systems.

The 2016 Population and Housing Census is the most valid and reliable source of information on Bermuda's societal inequalities. It has shown a link between race and wider markers of socioeconomic inequalities[8]. Figure 1 has been compiled from census maps and demonstrates that those census districts with a higher percentage population identifying as black tend also to be districts with a higher percentage of working age adults with no academic qualifications, higher rates of unemployment and lower median annual income. Therefore, race can be a useful marker of societal inequalities, although these societal-level associations may not necessarily be seen at the level of the individual.

The 2016 census also mapped the percentage of population without health insurance coverage (Figure 2). This unsurprisingly follows the patterns shown for wider socioeconomic inequalities and is likely to further contribute to the Inverse Care Law discussed earlier.

Insurance coverage will be discussed in more detail in the Variation in access to healthcare section of this report.

8 Department of Statistics. Population and Housing Census. 2016. Available: https://www.gov.bm/sites/default/files/2016%20Census%20Report.pdf

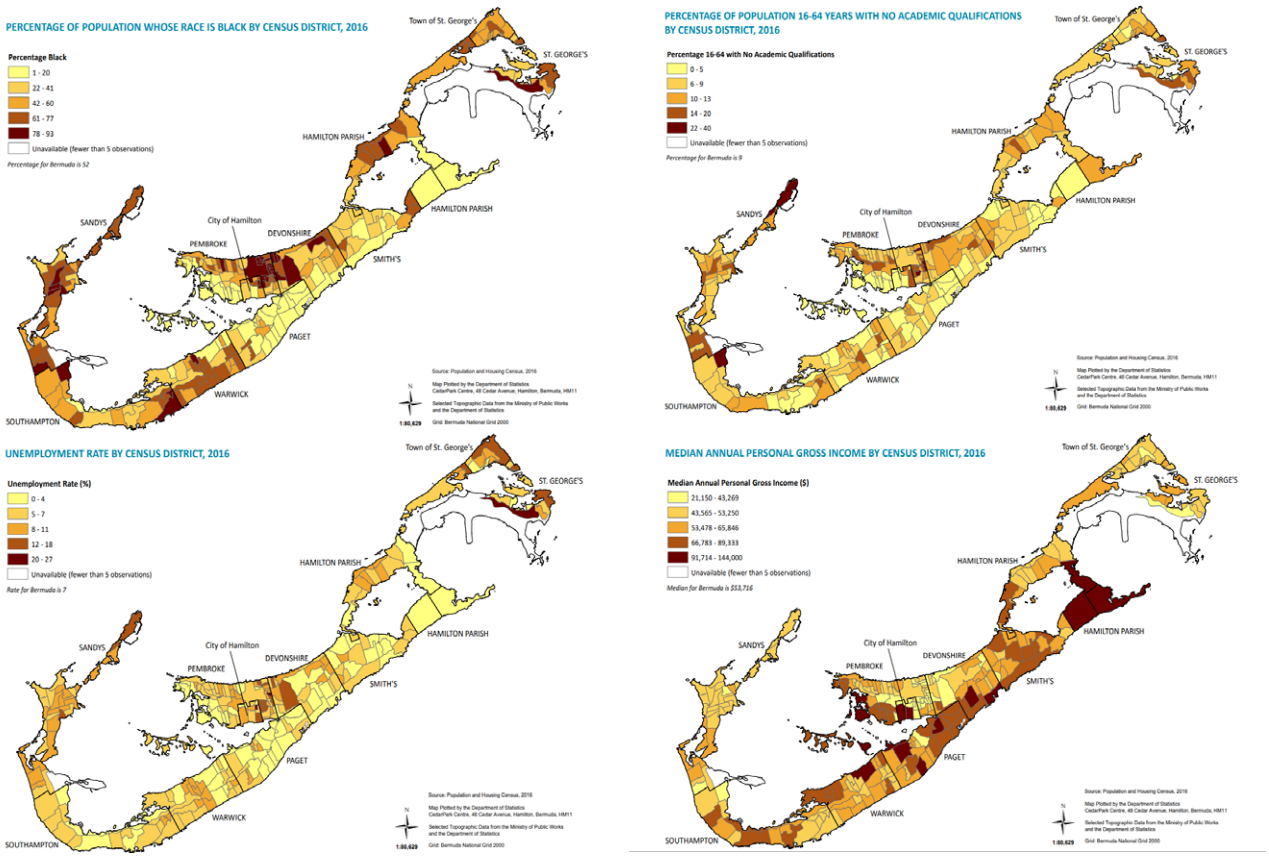


Figure 1. Socioeconomic markers by census district (details in each panel), 2016, Department of Statistics[9]

9 Department of Statistics, Government of Bermuda. 2016 Bermuda Census Maps. https://www.gov.bm/2016-bermuda-census-maps

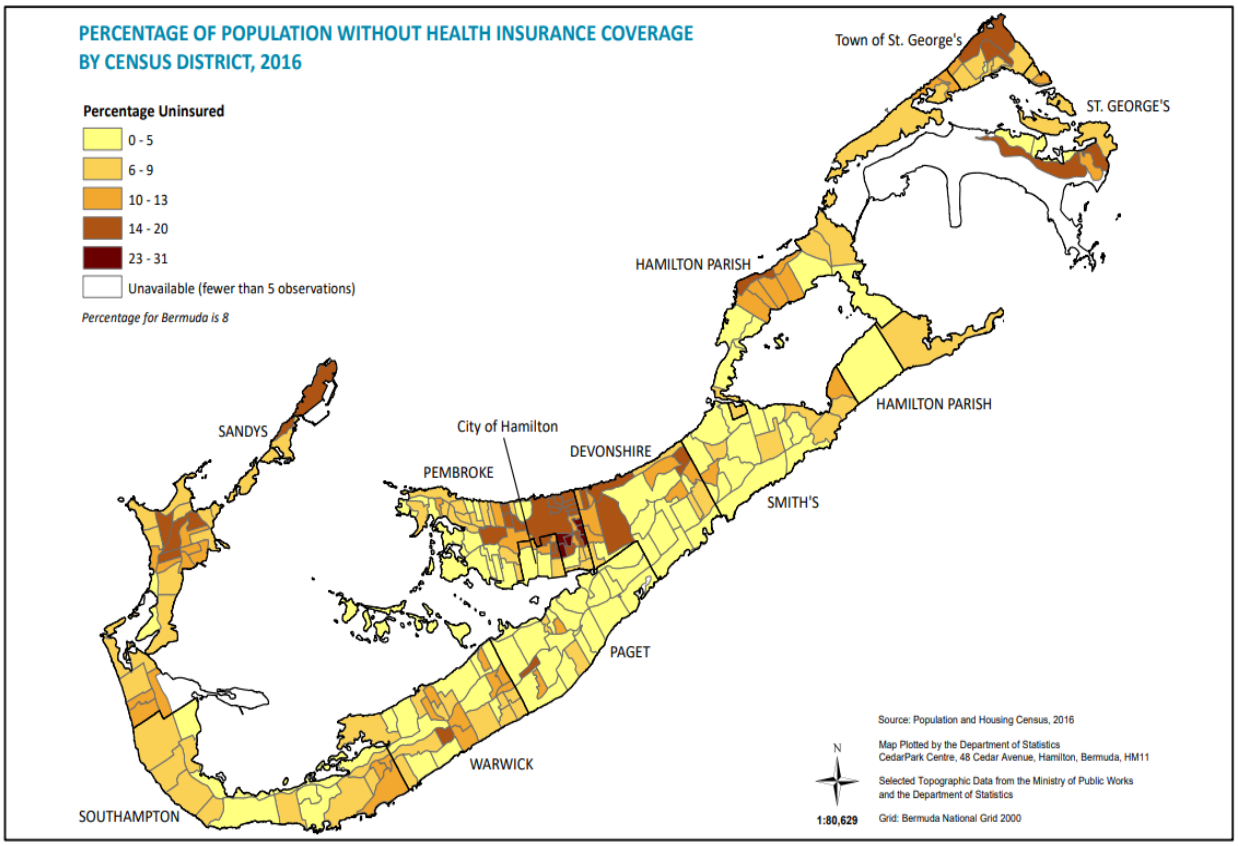


Figure 2. Population without health insurance coverage, 2016, Department of Statistics

Variation in Mortality & Morbidity

The distribution of causes of mortality in Bermuda (2010-2019) is shown in Figure 3. In Bermuda, like other high-income countries, the leading causes of mortality (death) over the 10 years pre-pandemic were chronic non-communicable diseases. Diseases of the circulatory system and neoplasms (cancers) accounted for approximately 60% of deaths annually. In contrast, deaths due to infectious and parasitic diseases accounted for only 2% of all deaths during this period. More common were deaths due to mental and behavioural and nervous system disorders, including Alzheimer's disease and dementia (10%), endocrine, nutritional, and metabolic diseases, such as diabetes (7%), respiratory diseases, including pneumonia (6%) and external causes such as accidents and violence (5%).

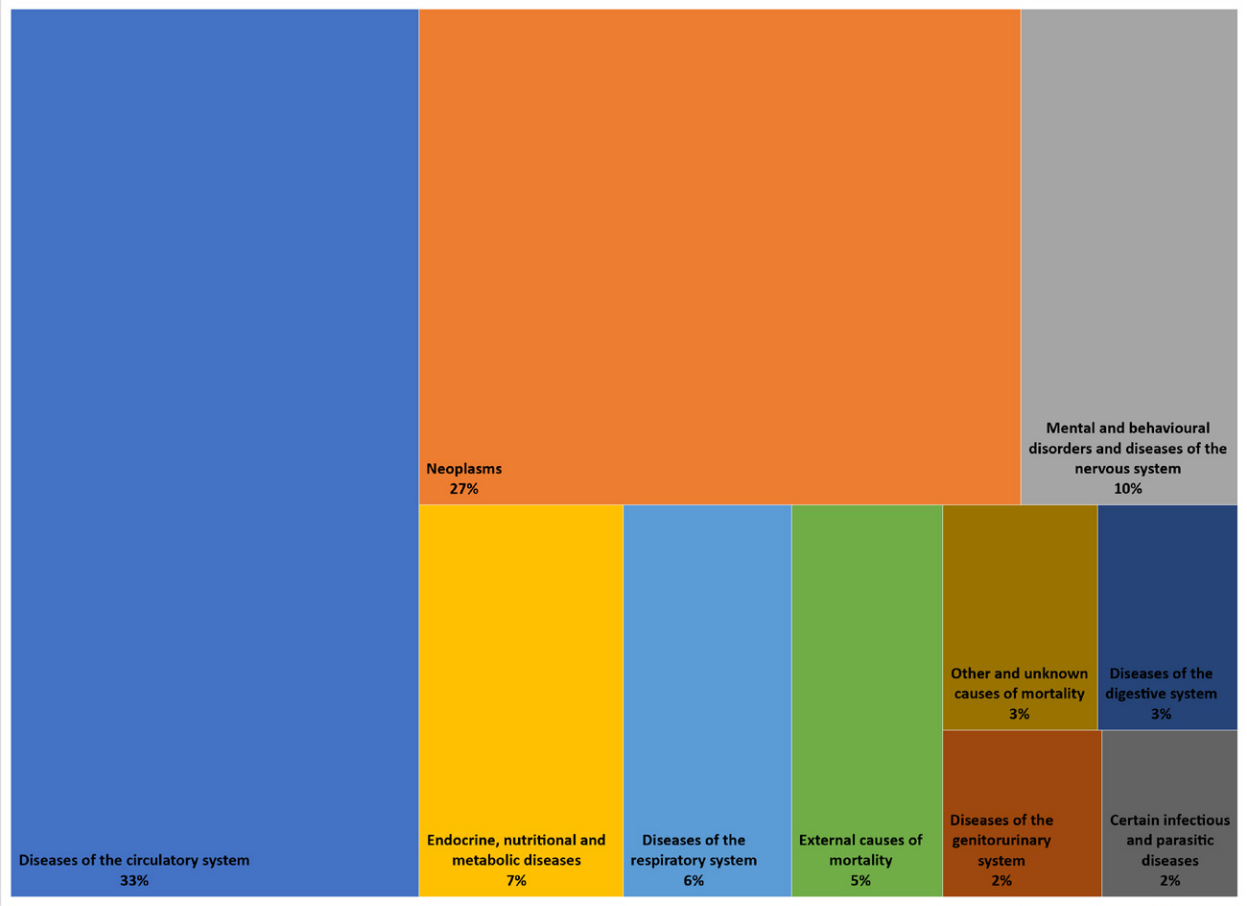


Figure 3. Distribution of causes of mortality, 2010-2019, Epidemiology and Surveillance Unit

Preliminary data for the distribution of causes of mortality in Bermuda (2020-2021) is presented in Figure 4. This data shows that the proportion of deaths due to diseases of the respiratory system more than doubled, mainly due to deaths with COVID-19 pneumonia documented as the cause. This will be further explored in the COVID-19 and Inequalities section of this report.

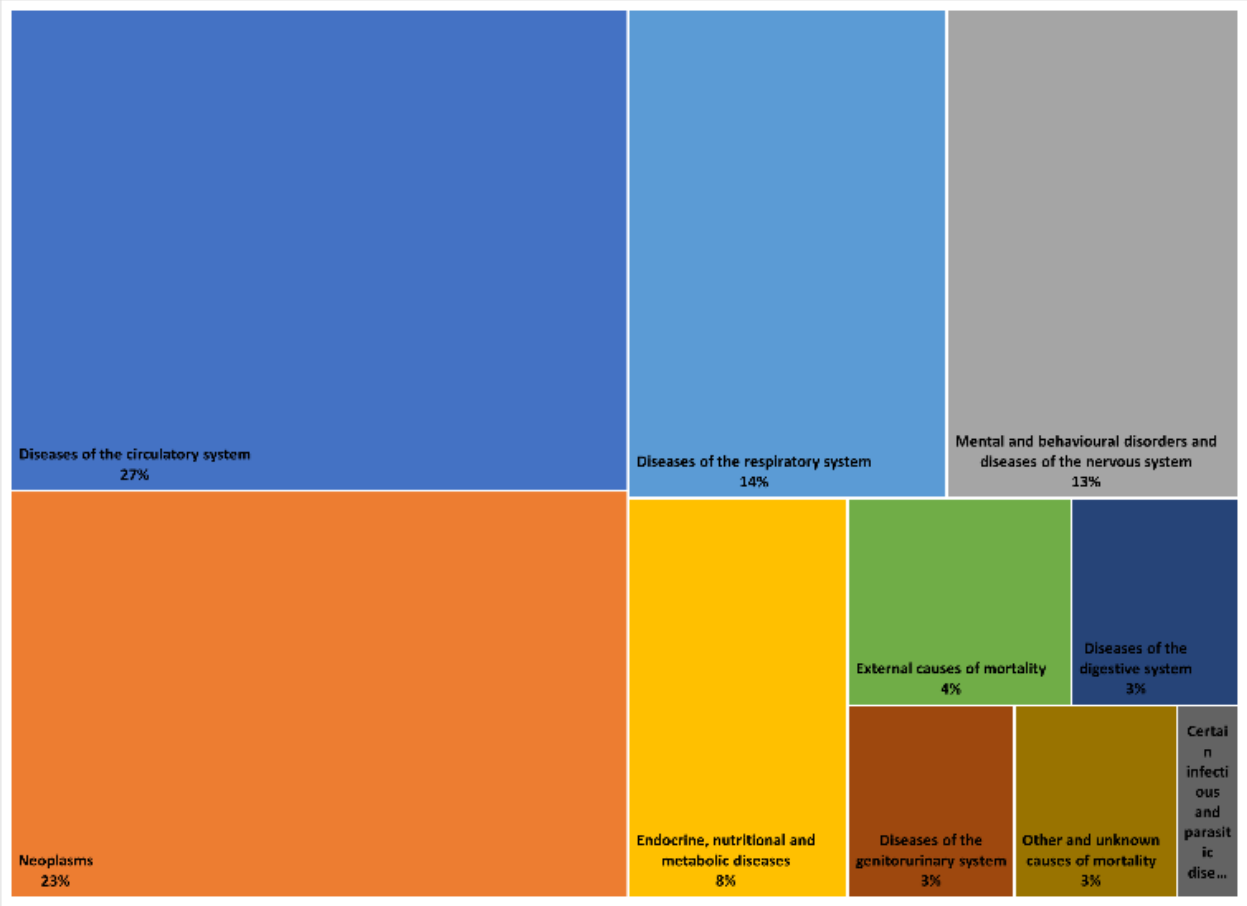


Figure 4. Distribution of causes of mortality, preliminary 2020-2021, Epidemiology and Surveillance Unit

Data on disease-specific morbidity (ill health) as analysed by health insurance claim costs is shown in Figure 5. This data shows a similar pattern with chronic non-communicable diseases, such as cancer, chronic kidney disease, heart disease, stroke and hypertension and diabetes, contributing substantially to insurance claim costs.

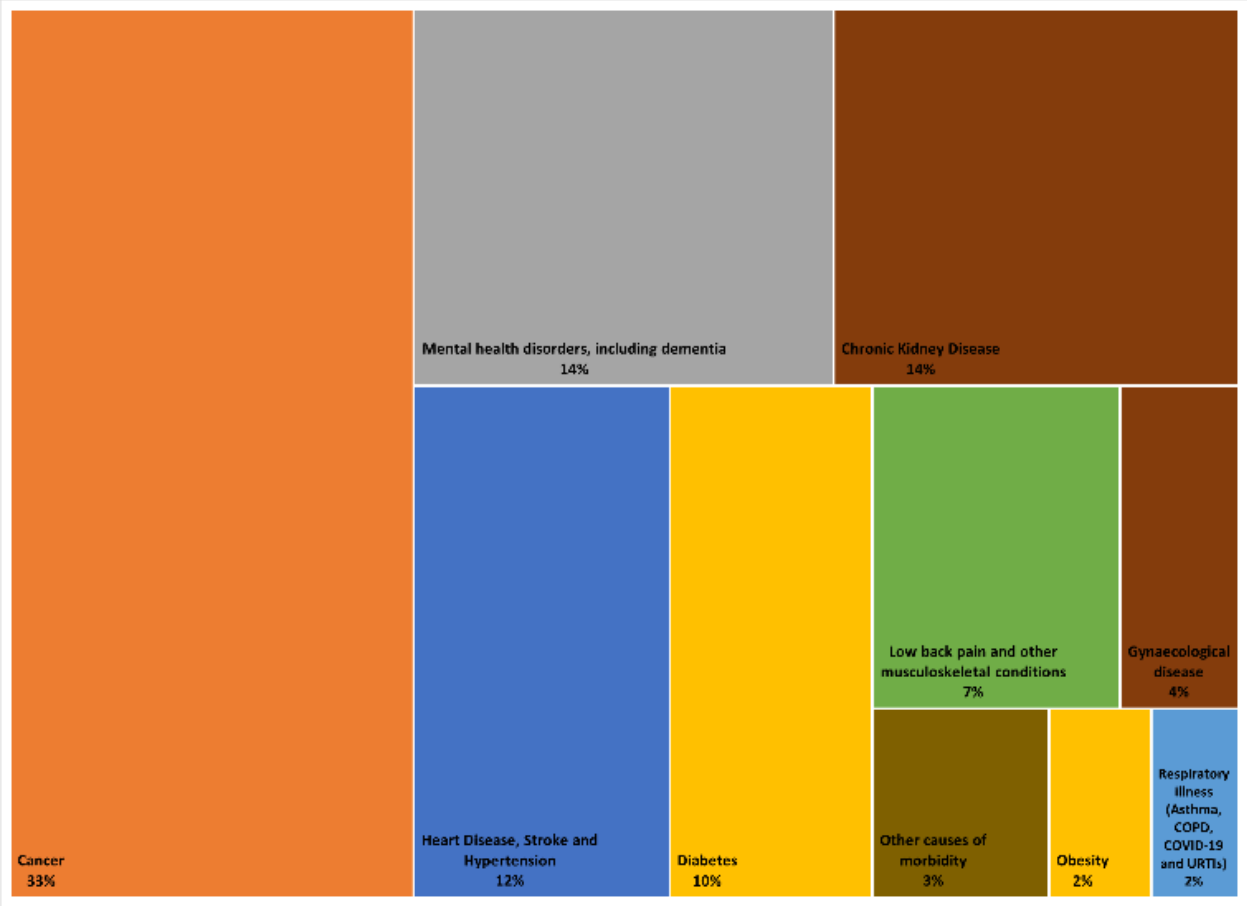


Figure 5. Distribution of diagnoses for health insurance claim costs, FY2020-2021, Bermuda Health Council

The impact of long-term ill health arising from these conditions can exacerbate pre-existing inequalities resulting in individuals being unable to fulfil their full potential both in the workplace and in society. Poorly managed chronic disease is a major cause of absence workplace, resulting in lost income, psychosocial problems (such as isolation, loss of social support and loss of self-esteem and self-worth) and loss of employment related health insurance. The end result is a vicious circle of worsening health, increasing deprivation and reduced access to healthcare needed to solve worsening health problems. The complex interplay between these factors is shown in Figure 6.

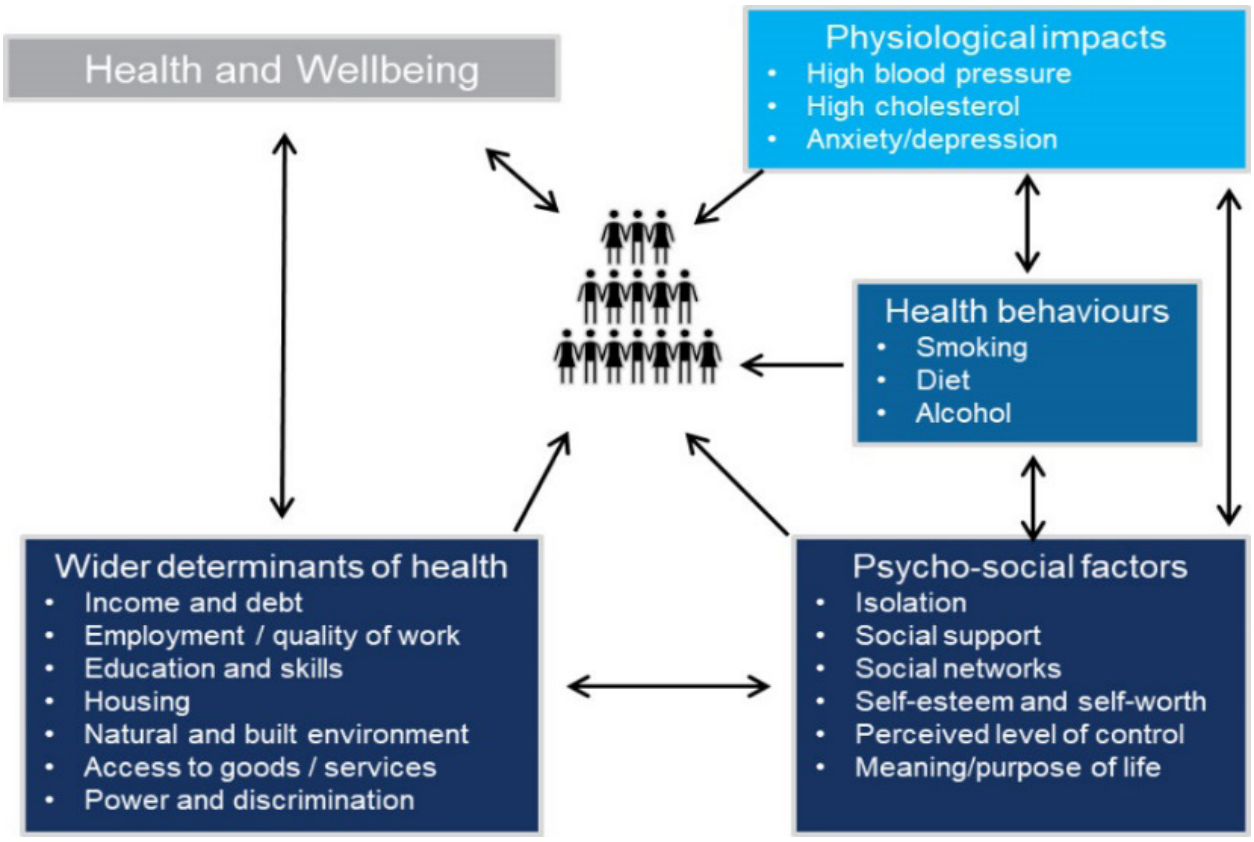


Figure 6. Factors contributing to health inequalities (adapted from Labonte model) [10]

Whilst each of the chronic disease areas outlined have their own specific pathway of pathogenesis, all are associated with a common series of risk factors. The US Centers for Disease Control and Prevention have outlined four major risk factors common to the leading chronic diseases, as shown in Figure 7.

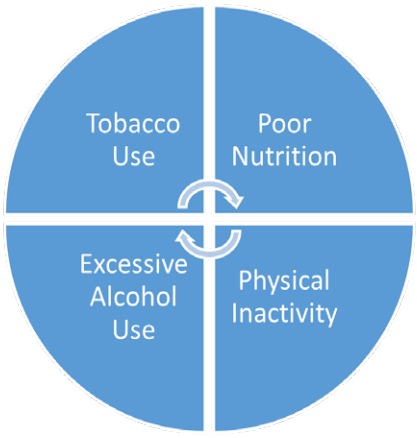


Figure 7. Major risk factors for chronic diseases

10 Office for Health Improvement and Disparities. Health disparities and health inequalities: applying All Our Health. 2022. Available: https://www.gov.uk/government/publications/health-disparities-and-health-inequalities-applying-all-our-health/health-disparities-and-health-inequalities-applying-all-our-health

These four risk factors or behaviours can often cluster, with socioeconomic status being the strongest predictor of engaging in multiple risk behaviours[11]. In Bermuda, there is a lack of robust population-wide data that links the prevalence of these risk factors with socioeconomic data. There is evidently a requirement for further evidence-based policies to address these risk factors, particularly for the most deprived, who are likely to be at greatest risk. There is also a role for the healthcare system to develop pathways to prevent ill-health exacerbating underlying inequalities by ensuring that those with chronic conditions have high-quality management to enable their continued participation in the workforce. The four stages of the prevention model, as shown in Figure 8, can be used to achieve both aims.

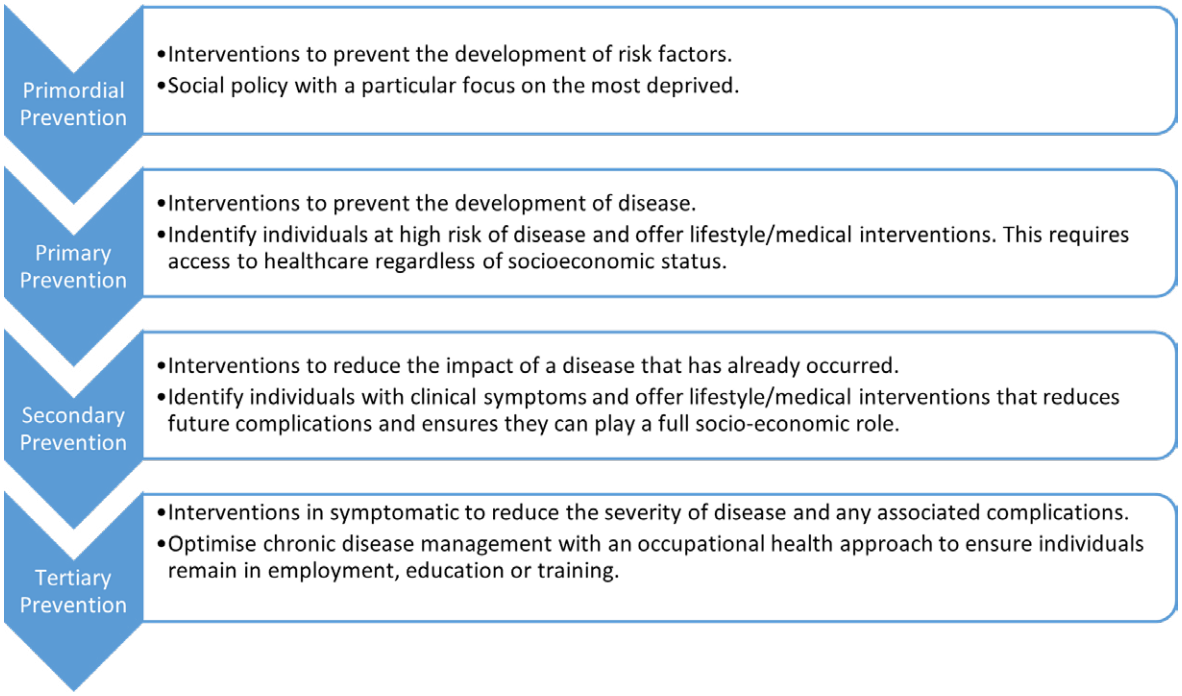


Figure 8. The Four Stages of Prevention

Finally, there is a need for Bermuda to link health information with socioeconomic data at the individual level to build a robust understanding of health inequalities. The Universal Health Coverage Programme looks set to prioritise this, with the National Digital Health Strategy prioritising equity as one of its design principles. The aim is to develop a national patient record that integrates all health information related to a person and allows individuals to access and add personal health content and manage privacy and access rights of their record via a 'patient portal'.

11 Meader, N., King, K., Moe-Byrne, T. et al. A systematic review on the clustering and co-occurrence of multiple risk behaviours. BMC Public Health. 2016;16,657. https://doi.org/10.1186/s12889-016-3373-6

Variation in access to healthcare

The healthcare system plays a major role in preventing and effectively managing health conditions, particularly chronic diseases that require ongoing clinical management with a focus on long-term outcomes. High-quality chronic disease management is predominantly community based and is characterised by collaboration between general/family practice, medical specialists, and allied health professionals. Therefore, equitable access to healthcare is a prerequisite to addressing health inequalities driven by unequal social determinants of health and health behaviours.

Bermuda's healthcare system financing is based on insurance, a mandatory employment benefit for employees working more than fifteen hours per week. Those aged 65 years and older can access the government's FutureCare scheme and may be entitled to a government subsidy[12] to help with affordability. FutureCare scheme is not as generous as other major medical insurance schemes. It requires significant levels of co-payments to access many benefits.

Availability of health insurance is thus tied to employment status, Bermudian status, and previous pattern of residency. This limits access to healthcare for the unemployed population or those aged 65 years and older without access to affordable health insurance. The 2016 census identified 8% of the population as uninsured, with a further 17% only having basic coverage[13]. Worsening unemployment during COVID-19 has led to revised estimates of 12% of the population being uninsured and a further 23% having only basic cover or unaffordable insurance premiums.

As previously discussed, the demographic features of the uninsured population are associated with wider deprivation. The Black population represented 77% of those without health insurance, with a social gradient being associated with employment status and level of education. The details are in the supplementary document.

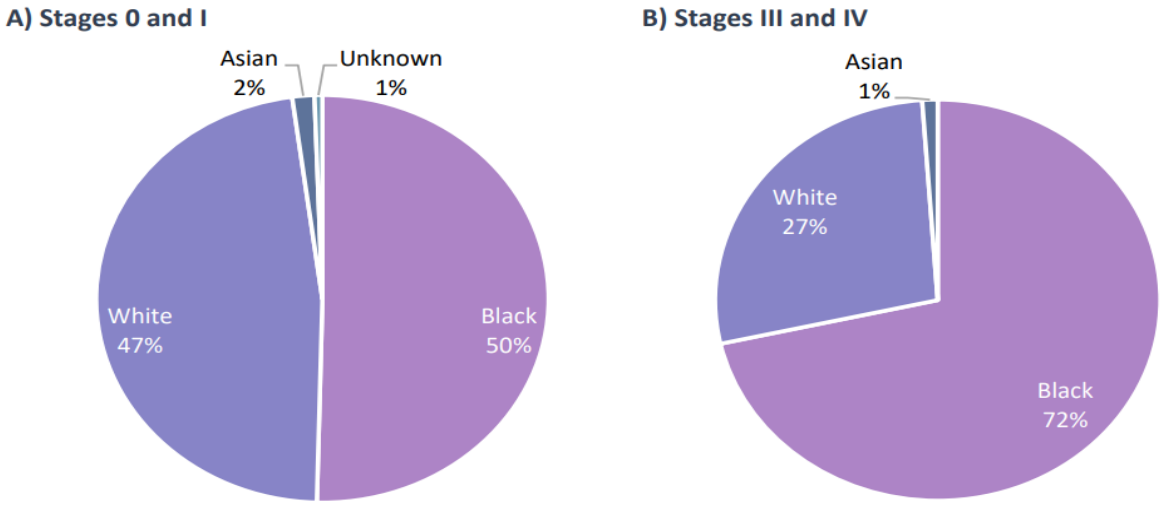
Co-payments are also likely to play an important barrier in patients accessing healthcare, with out-of-pocket payments for both healthcare visits and associated products' costs (medicines, medical equipment, spectacles etc.) preventing patients from seeking care until conditions are more serious.

The *Bermuda National Cancer Control Plan* suggests that inequalities could be preventing patients seeking early diagnosis of cancer, which is potentially linked to barriers to accessing healthcare such as lack of insurance and co-payments. Cancer diagnosed earlier (stages 0 and I) are associated with better outcomes than those diagnosed later (stages III and IV). However, the distribution of early and late diagnoses are not equally distributed, with white patients constituting a greater proportion of early diagnoses and Black patients a greater proportion of late diagnoses (Figure 9)[14].

12 Known as the Certificate of Entitlement

13 Department of Statistics. Population and Housing Census. 2016. Available: https://www.gov.bm/sites/default/files/2016%20Census%20Report.pdf

14 Bermuda Cancer and Health Centre. Bermuda National Cancer Control Plan. 2022. Available: https://www.cancer.bm/Uploaded%20Files/annual%20report/2021/bermuda%20nccp_national%20cancer%20assessment_2022%20(2).pdf



Data source: Bermuda National Tumour Registry, Bermuda Hospitals Board.
Note: Excluding non-melanoma skin cancer

Figure 9. Cancer diagnoses, excluding non-melanoma skin cancer, by stage at diagnosis and race, Bermuda National Cancer Control Plan

This example of later cancer diagnoses may be an indicator for delayed and emergency presentation amongst a broader range of health conditions. As well as resulting in poorer outcomes for patients (including premature mortality), there is also an impact on the healthcare system. Conditions that have progressed to severe complications are more likely to require hospital treatment than if managed earlier (e.g., a heart attack versus well-controlled hypertension). Given that Bermuda Hospitals Board (BHB) is primarily funded through the Mutual Reinsurance Fund, which comes from everyone's insurance premium, and BHB is obliged to treat emergency cases, the lack of access to community chronic disease management may paradoxically cost insurance policyholders more than if everyone could access high-quality primary care through a system of universal health coverage.

The overall picture of Bermuda's healthcare system is one that exacerbates pre-existing inequalities. The Inverse Care Law is a core characteristic feature of the healthcare system, in which those with greatest health needs have the least access to healthcare. The Universal Health programme is a crucial opportunity to start to address this inequality in access to care. The National Digital Health Strategy's stakeholder engagement has identified the perception of worsening access to care due to inequalities:

> *"The disparities are increasing. If you're underinsured or uninsured, it's very tough to get the treatments that you want"*[15]

However, further investigation is required to understand the detailed impact of inequalities on patients accessing healthcare and its ultimate impact on health outcomes. Again, this will require better linking health information, especially insurance data, with socioeconomic data at the individual level to build this picture. It would also require constructing indices of deprivation that can consistently measure the scale of inequalities and the progress towards reducing these.

15 Quote from the National Digital Health Strategy's series of insight interviews with healthcare professionals conducted by the University of Edinburgh

Vulnerable Groups and Inequalities

In addition to broad disparities across society, specific groups are particularly at risk of poorer health outcomes relating to inequalities. This section will briefly outline the impact of health inequalities in these groups and the requirement to meet their specific needs in future health policy.

People with Disabilities. People with disabilities are more likely to die at younger ages, have worse health, and experience more restrictions in everyday functioning. Disability can be a significant barrier to work (or at least work without suitable adjustments). In 2016, 1174 of the working-age population was unable to work due to disability[16]. Work is an important factor in promoting health and this could compound existing health inequalities due to disability. The Human Rights Act 1981 outlines that disability should not be a reason for disqualification from work if it is possible to modify employment circumstances without causing unreasonable hardship to the employer or prospective employer. In 2020-2021, 782 people with a disability received financial assistance (47% of the total receiving financial assistance)[17].

Unfortunately, there is a lack of robust population-wide data on disability, resulting in no robust calculations of disability prevalence or detailed information on the type of disability to help plan services. It would be beneficial for Ageing and Disability Services to collect these types of data and to link them with broader socioeconomic and health data to understand the impact of health inequalities on people with disabilities with more granularity.

Homeless Population. The 2016 Population and Housing Census defines non-sheltered populations as those with no fixed abode and who do not stay in adult shelters. The 2016 census found that 138 people were homeless, of which 93% were black, 88% were male, and 50% had no academic qualification. Whilst a 2022 report has found that rates of homelessness have increased by over 600% in the past 21 years (from 30 cases in 2000 to 274 in 2022)[18]. The discrepancy may be due to the 2022 report's methodology being more conducive to the homeless population identifying themselves.

A lack of resources (such as having no fixed address) can make it difficult for the homeless population to access employment, healthcare, and other social services. According to the 2022 survey, the homeless population had a high proportion of riskier health behaviour, with over 9 in 10 consuming alcohol, tobacco, or other substances and close to 3 in 10 believing that their use of substances had impacted their ability to secure stable housing. The COVID-19 pandemic resulted in further difficulties for many homeless persons, with over half stating a negative impact on employment, income, and social/emotional well-being.

Migrants. Migration status is an important determinant of health. In 2016, 19,332 foreign-born people were living in Bermuda, with the non-Bermudian population making up 25% of the workforce[19]. Bermuda's migrant workforce falls into two broad socioeconomic groups: those on relatively high salaries working in international business and those on lower salaries working in low-skilled manual jobs, in many cases within the hospitality industry. Local data on migrant health remains scanty, but global data would suggest that migrant workers are more likely to suffer occupational accidents compared to non-migrant workers.[20]. Further work is required to understand migrant health, particularly the differences between high-income and lower-income migrants. This work can then be used to consider migrant health in future policy will be important to mitigate health inequalities in Bermuda.

16 Department of Statistics. Population and Housing Census. 2016. Available: https://www.gov.bm/sites/default/files/2016%20Census%20Report.pdf

17 Government of Bermuda. Department of Financial Assistance. Annual report 2020/2021 Available at: https://cloudfront.bernews.com/wp-content/uploads/2022/05/DFA-Annual-Report-2020-21.pdf

18 Catalyst Consulting Limited. Toward Ending Homelessness in Bermuda: Quantitative Research Full Report "Empowering the Most Vulnerable". 2022. Available: https://ccbdapp.files.wordpress.com/2022/07/toward-ending-homelessness-in-bermuda-quantitative-research-report-full-report-july-18-2022.pdf

19 Department of Statistics. Bermuda Digest of Statistics 2021. Available: https://www.gov.bm/sites/default/files/2021_Digest_of_Statistics.pdf

20 European Agency for Safety and Health at Work. Literature Study on Migrant Workers. 2009. Available: https://ec.europa.eu/migrant-integration/sites/default/files/2008-08/docl_1357_31847427.pdf

COVID-19 and Inequalities

The COVID-19 pandemic has exacerbated inequalities worldwide, not just health inequalities, but also socioeconomic inequalities, given the impact of the pandemic on travel and trade. In 2020, Bermuda saw a 6.9% contraction in GDP followed by 5.4% growth in 2021(adjusted)[21]. A GDP of $6.3 billion in 2021 remained below pre-pandemic levels of $6.5 billion. Economic sectors with higher proportions of lower-salaried workers, such as tourism, saw a sustained drop in economic activity. For example, "*accommodation and food service"* contracted by $430m (60.3%) in 2020[21]. This drop in economic activity will impact the wider social determinants of health due to changes in employment patterns, educational opportunities, and a disruption of psycho-social factors such as social networks. The Bermuda Foundation's Vital Signs® report has highlighted some of the financial impacts of the COVID-19 pandemic on people, with 40% of respondents accessing saving to meet financial obligations and with financial insecurity being cited as the leading reason for not feeling prepared to handle the second wave of the pandemic[22].

Work is ongoing to understand the full economic, health and social impacts of the COVID-19 pandemic. However, reports from other high-income nations (e.g., the UK) have found that the risk presented by COVID-19 correlated with socioeconomic position. This risk ultimately resulted in disparities in hospitalisations and deaths based on pre-existing health inequalities. COVID-19 risks and inequalities were linked to:

- **Infection Risk**
    - Those in lower socioeconomic groups had a heightened risk of exposure due to:
        - overcrowded housing
        - use of public transports
        - job roles not amenable to working from home[23].
- **Severe disease and mortality**.
    - Age-standardised COVID-19 mortality rates have been 3-4 times higher in the most deprived areas compared to the least deprived[24]
    - Ethnic minorities experience higher all-cause mortality rates and mortality rates from COVID-19[25]
    - People with disability were particularly at risk, with 6 out of 10 deaths in England in the first wave being those who reported a disability[26].

21 Department of Statistics. Annual Gross Domestic Product 2021 Highlights. 2022. Available: https://www.gov.bm/sites/default/files/GDP-2021-annual-publication.pdf

22 Bermuda Foundation. Bermuda Vital Signs® Special COVID-19 Pandemic Edition. 2022. Available: https://www.bermudacommunityfoundation.org/Portals/0/Uploads/Documents/BCF%20Covid%20Special%20Report%202022%20final1.pdf

23 Beale S, Braithwaite I, Navaratnam AM et al. Deprivation and exposure to public activities during the COVID-19 pandemic in England and Wales. J Epidemiol Community Health. 2022;76(4):319-326. https://doi.org/10.1136/jech-2021-217076

24 The Health Foundation. The continuing impact of COVID-19 on health and inequalities. 2022. Available: https://www.health.org.uk/publications/long-reads/the-continuing-impact-of-covid-19-on-health-and-inequalities#:~:text=Inequalities%20in%20COVID%2D19%20mortality%20by%20deprivation&text=Between%20July%20and%20December%202021,in%20the%20least%20deprived%20areas.

25 Public Health England. Disparities in the risk and outcomes of COVID-19. 2020. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf

26 Office for National Statistics. Updated estimates of coronavirus (COVID-19) related deaths by disability status, England: 24 January to 20 November 2020. 2022. https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/coronaviruscovid19relateddeathsbydisabilitystatusenglandandwales/24januaryto20november2020

Public Health Measures

- Those in lower socioeconomic groups were disproportionately impacted by public health measures necessary to control COVID-19, such as children missing face-to-face education with impacts including lost learning, poor mental health, and a reduction in safeguarding referrals[27]. This worsens the economic outlook as adults missed work as a result of shelter in place, lack of childcare for school closures and caring responsibilities for isolating or quarantining relatives.

However, the overall picture of COVID-19 and inequalities remain complex, with individual, social, economic, biological, and behavioural risk overlapping and interacting[28].

Inequalities were also associated with the uptake of COVID-19 vaccination, with the most deprived being the least likely not to be fully vaccinated. This pattern has been seen across the world, including Bermuda. The Government of Bermuda's Pandemic Administration System collected detailed information on vaccination uptake, which could be linked to socioeconomic indicators such as census district and race.

Figure 10 shows that, in general, the lowest rates of COVID-19 vaccination were found in the census districts with the highest markers of socioeconomic deprivation (Figure 1). The Ministry of Health responded to this unmet need by setting up vaccination pop-up clinics in previously underserved areas, including St David's Island.

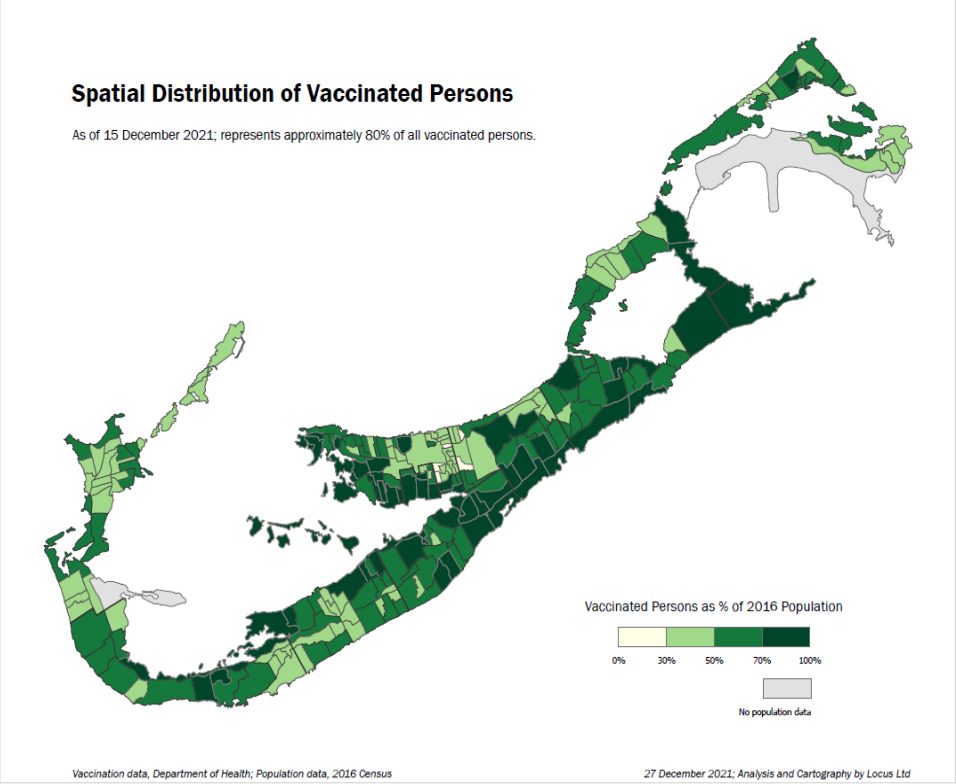


Figure 10. Distribution of persons vaccinated for COVID-19 through December 2021 using data from Government of Bermuda Pandemic Administration System via Locus Limited

27 Viner R, Russell S, Saulle R et al. School closures during social lockdown and mental health, health behaviors, and well-being among children and adolescents during the first COVID-19 wave: a systematic review. JAMA Pediatr. 2022;176(4):400–409. https://doi.org/10.1001/jamapediatrics.2021.5840

28 Department of Health and Social Care. Chapter 2: Disparities in Technical report on the COVID-19 pandemic in the UK. 2023. Available: https://www.gov.uk/government/publications/technical-report-on-the-covid-19-pandemic-in-the-uk/chapter-2-disparities#important-factors-in-the-covid-19-pandemic

Despite efforts to address COVID-19 vaccination inequalities, data from the vaccination programme has shown a gap in the uptake of booster vaccinations between those who are black, Asian, and mixed-race, and those who are white or did not report their race (Figure 11). This differential in booster uptake may continue to present a differential effect of COVID-19 by racial and socioeconomic groups across society.

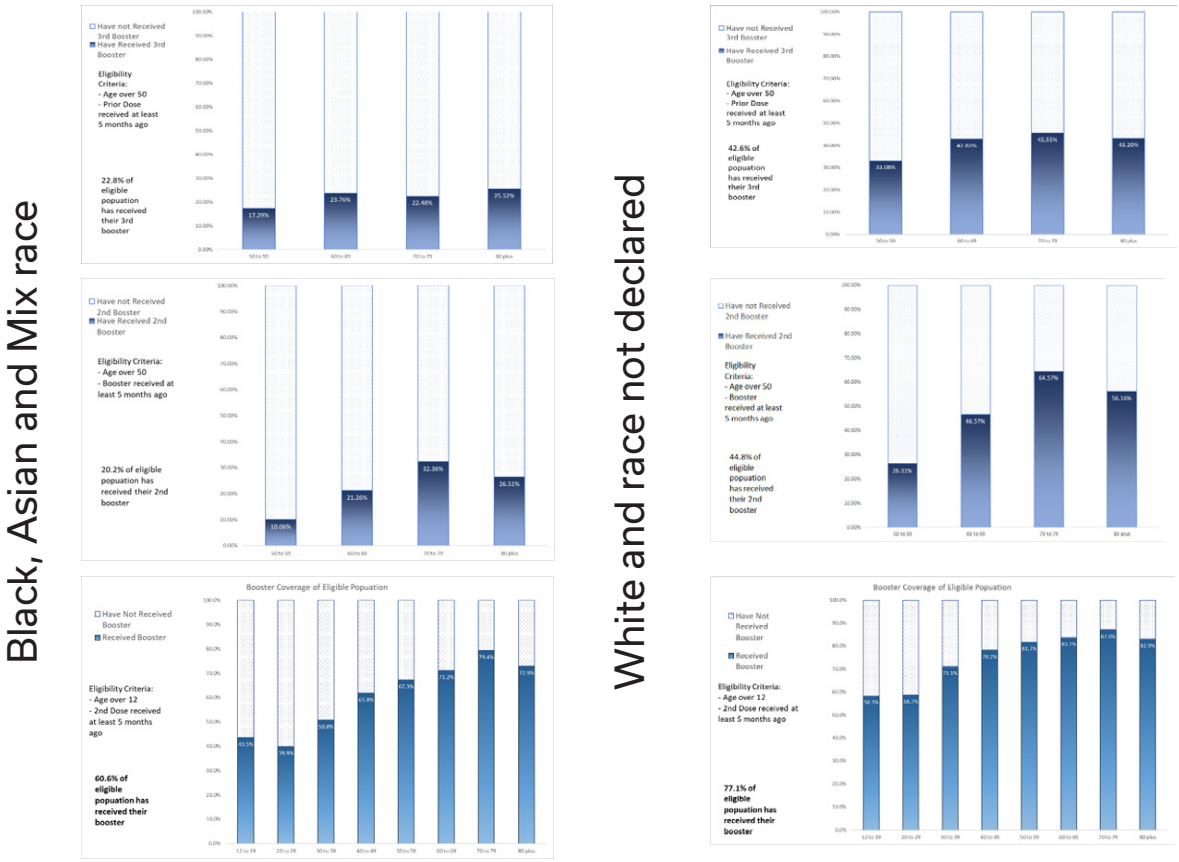


Figure 11. Vaccination uptake by race through December 2021 using data from Government of Bermuda Pandemic Administration System

An analysis of the preliminary mortality data from 2020-2021, indicated that Black persons were disproportionately affected, accounting for 9 out of every 10 COVID-19-related deaths.

Considerable uncertainty remains about the impact of COVID-19 on health, including health inequalities. Further work will be required to understand the pandemic's epidemiological, social, and economic consequences, which may impact future health policy and healthcare services planning.

Health Inequalities: Implications for Bermuda

Bermuda is characterised as a society with significant socioeconomic inequalities, including income, employment prospects and educational attainment. There is overlap between these socioeconomic factors and racial inequalities, with the non-white population appearing to be more disadvantaged.

Bermuda's health inequalities exist within this wider societal context. However, due to the current health information infrastructure, it has been difficult to map health inequalities onto societal inequalities in a consistent or precise manner. Improving this underlying health information system will be a key constituent in addressing health inequalities and looks set to be a priority for the upcoming National Digital Health Strategy within the Universal Health coverage programme.

From the available information, health inequalities appear to track wider societal factors. Socioeconomic disparities are driving unequal social determinants for health, particularly for the most vulnerable groups in society, whilst the current healthcare system is exacerbating these inequalities through the Inverse Care Law. Those with the greatest health needs appear to have the least access to the healthcare system. Substantial numbers of the population are either uninsured or have access only to basic health insurance benefits. The fact that insurance is linked to employment-status may mean that those with health problems that are significant enough to remove them from the labour-force suffer a double burden as they may lose access to their insurance benefits.

At system-level, health inequalities may be driving additional healthcare costs, as people with significant health needs are unable to access cost-effective chronic disease management in primary care, instead relying on more expensive episodic emergency treatments that are ultimately ineffective for long-term health outcomes. A lack of upstream chronic disease management may have a detrimental impact on Bermuda's workforce, and ultimately, the economy. Chronic diseases, particularly mental health and musculoskeletal disorders are a leading reason for workforce absences across high-income countries, particularly in manual occupations. Therefore, addressing health inequalities should become a priority for employers, and occupational health a priority for the healthcare system.

Bermuda now stands at a crossroads with enormous opportunities for tackling health inequalities. COVID-19 has identified Bermuda's vulnerabilities. The Bermuda Health Strategy 2022-2028 and Universal Health Coverage programme present a chance for Bermuda to reform its health system to become fairer, more effective, and better value for money for all who live in Bermuda. The opportunity is ours to grasp to ensure Bermuda can achieve "*healthy people in healthy communities*"![29]

> *"Inequality in health is the worst inequality of all. There is no more serious inequality than knowing that you'll die sooner because you're badly off"*[30]

Frank Dobson, UK Secretary of State for Health 1997-1999

29 Ministry of Health. Bermuda Health Strategy 2022-2027. 2022. Available: https://www.healthstrategy.bm/

30 Hansard. *Health Inequalities.* Volume 672: debated on Wednesday 4 March 2020. Available: https://hansard.parliament.uk/commons/2020-03-04/debates/F45AA8C2-154A-497D-88E4-80304A4714ED/HealthInequalities

Supplementary Data Appendix to the Chief Medical Officer's Annual Report 2023

This supplementary appendix contains the underlying data to the *Chief Medical Officer's Annual Report 2023: A Post-Pandemic Focus on Health Inequalities*. It is based on the format developed by the Pan American Health Organization's Caribbean Sub-Regional Center, which has been adapted for Bermuda's needs.

GEOGRAPHY

Figure 1: Map of Bermuda

Description: Bermuda is a small archipelago situated in the northern Atlantic Ocean. It is comprised of seven main islands and over 100 smaller islands. The main land area is approximately 21 square miles and densely populated.

DEMOGRAPHY

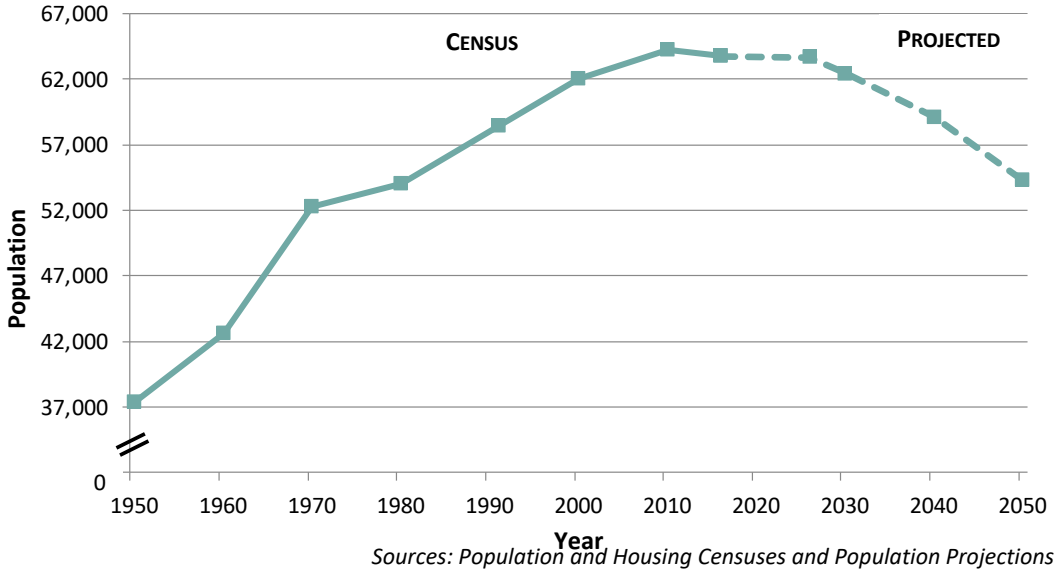
Population Projections

Table 1: Registered births and deaths, 2011-2021
(SOURCE: Department of Statistics[1])

Year	Live Births	Deaths
	Total	Total
2011	670	429
2012	648	422
2013	648	471
2014	574	480
2015	583	478
2016	591	492
2017	576	481
2018	530	535
2019	525	535
2020	541	566
2021	494	727

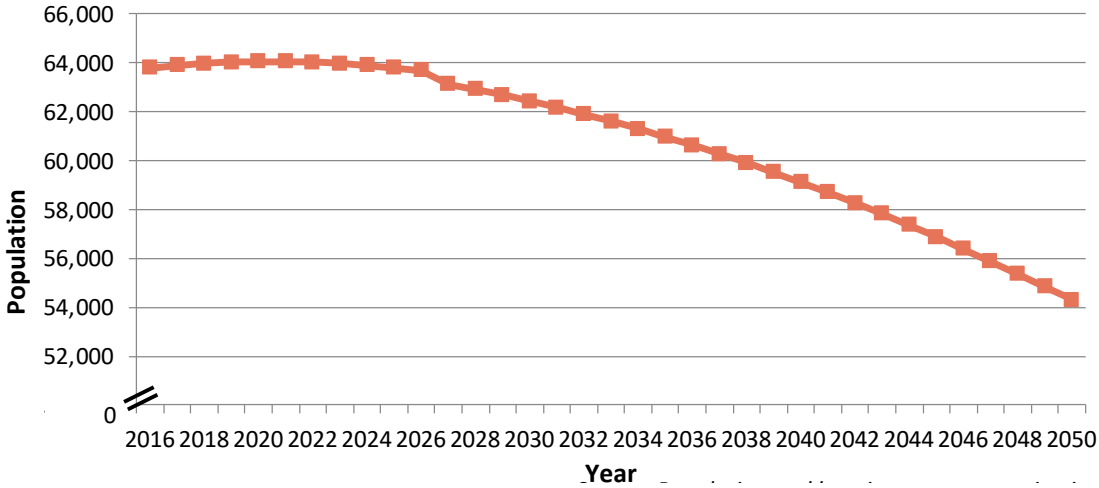
1 Department of Statistics, Government of Bermuda. Digest of Statistics 2021. Available: https://www.gov.bm/sites/default/files/2021_Digest_of_Statistics.pdf

Figure 2: Bermuda Population 1950-2050
(SOURCE: Department of Statistics)
NB: Data Limitations[2]



Sources: Population and Housing Censuses and Population Projections

Figure 3: Projected population 2016-2050
(SOURCE: Department of Statistics)
NB: Data Limitations as per footnote [2]



2 **Limitations of Projections.** Population projections are not predictions or forecasts. They are illustrations of how the structure, size and characteristics of Bermuda's population would change if certain assumptions on fertility, mortality and migration are held true over the projection period. While the assumptions are based upon an assessment of short–term and long–term demographic trends, there is no certainty that any of the assumptions will be realised. The projections do not take into account future non–demographic factors (e.g. major government policy decisions, economic factors, natural disasters, etc.) which may diminish the accuracy of the projections. Historically, Bermuda's projections are updated after each population and housing census so that new information about demographic trends can be included. The age–sex structure in this population projections report was based on self–reported data collected in the 2016 Population and Housing Census.

Scope of the Projections. This population projection series is for Bermuda as a whole from July 1, 2016 until July 1, 2050. Projections are less reliable the further into the future they are because assumptions are less likely to hold true.

Net Migration. It was assumed that net migration would be zero each year over the projection period due to a lack of comprehensive migration data.

Birth and Death Data. The projection input file contains recorded births and deaths up to 2020.

Life Expectancy

Table 2: Average life expectancy at birth, 2010-2026 (SOURCE: Department of Statistics[3])

Mid-year	Life expectancy at birth
2010	75.9
2011	81.3
2012	81.9
2013	80.7
2014	80.9
2015	81.1
2016	81.9
2017	82.4
2018	82.6
2019	82.7
2020	82.8
2021	82.9
2022	83.0
2023	83.2
2024	83.3
2025	83.4
2026	83.5

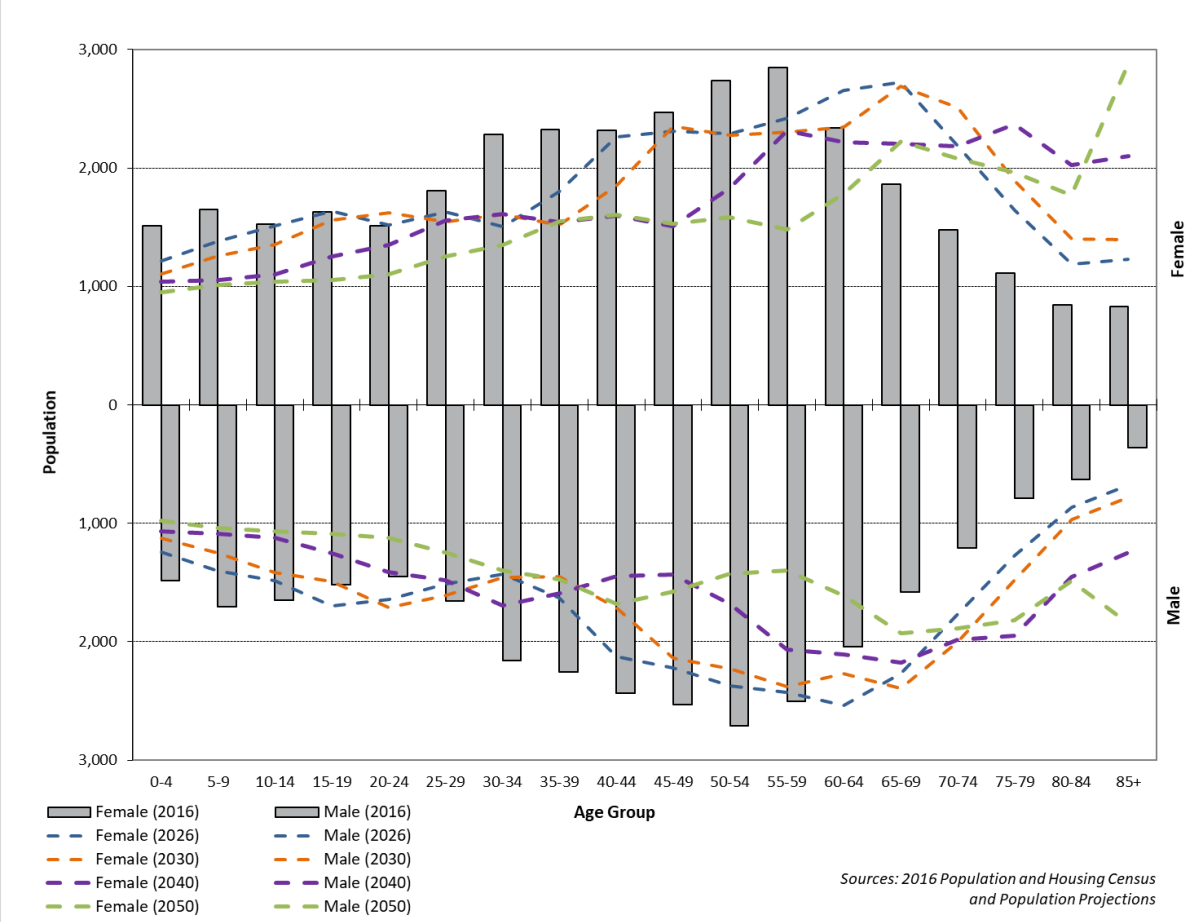
Table 3: Life expectancy at birth, 1960-2016 (SOURCE: Department of Statistics[4])

Year	Male	Female
1960	70.6	65.1
1970	66.9	73.9
1980	68.7	76.1
1991	70.0	78.3
2000	75.3	80.6
2010	75.9	83.6
2016	78.6	85.3

3 Department of Statistics, Government of Bermuda. Bermuda's Population Projections 2016-2026. Available: https://www.gov.bm/sites/default/files/Bermuda-Population-Projections-2016-2026.pdf

4 Department of Statistics, Government of Bermuda. Bermuda's Population Projections 2016-2026. Available: https://www.gov.bm/sites/default/files/Bermuda-Population-Projections-2016-2026.pdf

Figure 4: Population pyramid with 2016 census population and 2016 projected population
(SOURCE: Department of Statistics)
NB: Data Limitations as per footnote 2



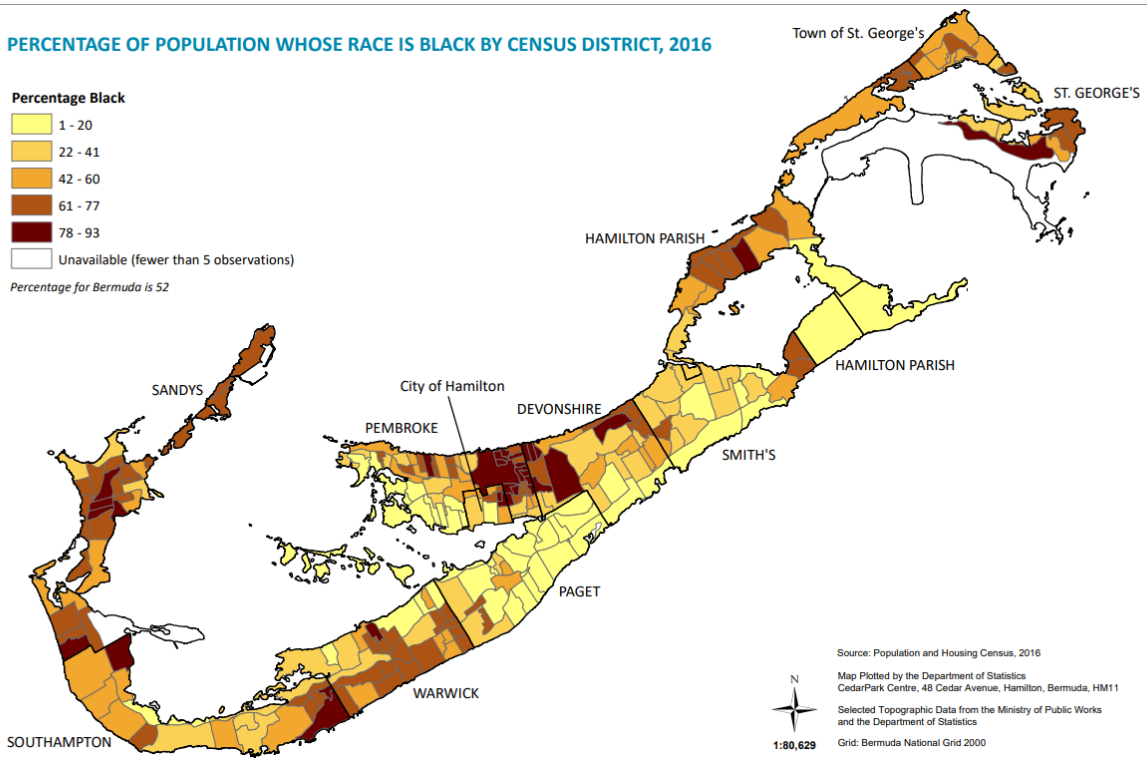
Ethnicity

Table 4: Population by ethnic group, 2016
(SOURCE: Department of Statistics[5])

Ethnic Group	Population	Percentage of Total Population
Black	33339	52%
White	19466	31%
Asian	2592	4%
Mixed	5780	9%
Other	2553	4%
Not Stated	49	0%

5 Department of Statistics, Government of Bermuda. Digest of Statistics 2021. Available: https://www.gov.bm/sites/default/files/2021_Digest_of_Statistics.pdf

Figure 5: Percentage of population who identify as Black by census district, 2016
(SOURCE: Department of Statistics[6])



Child and Maternal Health Vital Indicators

Table 5: Basic Demographic Indicators - Child and Maternal Mortality (SOURCE: ESU)
No data displayed due to the reporting of small numbers to protect privacy.

Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Years available
Maternal Mortality Ratio	0	0	0	0	0	0	0	0	0	0	0	0	12
Under-5 Mortality Rate	2.6	1.5	1.5	4.6	5.2	3.4	3.4	0.0	1.9	1.9	0.0	0.0	12
Infant Mortality Rate	1.3	0.0	1.5	1.5	3.5	3.4	3.4	0.0	1.9	1.9	0.0	0.0	12
Post Neonatal Mortality Rate	1.3	0.0	0.0	1.5	3.5	0.0	0.0	0.0	1.9	0.0	0.0	0.0	12
Neonatal Mortality Rate	0.0	0.0	1.5	0.0	0.0	3.4	3.4	0.0	0.0	1.9	0.0	0.0	12
Stillbirth Rate	3.9	3.0	3.1	4.6	3.5	3.4	1.7	0.0	9.4	0.0	1.9	0.0	12

6 Department of Statistics, Government of Bermuda. 2016 Bermuda Census Maps. Available: https://www.gov.bm/2016-bermuda-census-maps

Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Years available
# of maternal deaths	0	0	0	0	0	0	0	0	0	0	0	0	12
# of under 5 deaths	2	1	1	3	3	2	2	0	1	1	0	0	12
# of infant deaths	1	0	1	1	2	2	2	0	1	1	0	0	12
# of postneonatal deaths	1	0	0	1	2	0	0	0	1	0	0	0	12
# of neonatal deaths	0	0	1	0	0	2	2	0	0	1	0	0	12
# of stillbirths	3	2	2	3	2	2	1	0	5	0	1	0	12
# of births	769	670	648	648	574	583	591	576	530	525	540	494	12
perinatal mortality rate	3.9	3.0	4.6	4.6	3.5	6.9	5.1	0.0	9.4	1.9	1.9	0.0	

Definitions	Source	
Maternal Mortality Ratio	WHO	The maternal mortality ratio (MMR) is defined as the number of maternal deaths during a given time period per 100,000 live births during the same time period. (WHO)
Under-5 Mortality Rate	WHO	The quotient between the number of deaths in children under 5 year of age in a given year and the number of live births in that year, for a given country, territory, or geographic area, expressed per 1,000 live births.
Infant Mortality Rate	PAHO	The quotient between the total deaths of children under one year of age residing in a certain country, territory or geographical area, during a specific calendar year, and the number of live births in the same population and year, expressed per thousand live births .
Post Neonatal Mortality Rate	PAHO	The quotient between deaths between 28 and 364 days of life of live births residing in a certain country, territory or geographical area, for a specific calendar year, and the total number of live births for the same population and year. It is expressed per thousand live births.
Neonatal Mortality Rate	PAHO	The quotient between the deaths of live births residing in a certain country, territory or geographical area before reaching 28 days of life, in a specific calendar year and the total number of live births for the same population and year, reported by the health authority. correspondent. It is expressed per thousand live births.
Stillbirth Rate	WHO	The stillbirth rate (SBR) is defined as the number of babies born with no signs of life at 28 weeks or more of gestation, per 1,000 total births.

SOCIO-ECONOMIC PROFILE

Economics and Employment

Table 6: Vital Economic Statistics

Indicator	Details	Comment
GDP per capita	$114,090[7]	4th highest globally
Cost of living	-	Highest cost of living globally[8],[9]

Table 7: Sector Contribution to GDP

Sector	% Contribution to GDP
International business	27.5%
Real estate	15.2%
Insurance and financial services	14.3%
Tourism	2.2%

Table 8: Major occupation groups, 2021 (SOURCE: Department of Statistics[10])

Occupation groups	Population	Percentage of Total Population
Professionals	6,496	21%
Senior Officials and Managers	6,150	20%
Service Workers and Shop and Market Sales Workers	5,851	19%
Clerks	4,602	15%
Technicians and Associate Professionals	2,751	9%
Craft and Related Trades Workers	2,544	8%
Plant and Machine Operators and Assemblers	1,191	4%
Elementary Occupations	956	3%
Skilled Agricultural and Fishery Workers	742	2%
Armed Forces	33	0%

7 The World Bank. GDP per capita (current US$) – Bermuda. Available: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=BM

8 Fox D. Bermuda tops cost of living index. Royal Gazette. 2021. Available: https://www.royalgazette.com/year-in-review/article/20211231/bermuda-tops-cost-of-living-index/

9 Numbero cost of living index https://www.numbeo.com/cost-of-living/rankings.jsp last assessed July 7, 2023

10 Department of Statistics, Government of Bermuda. Digest of Statistics 2021. Available: https://www.gov.bm/sites/default/files/2021_Digest_of_Statistics.pdf

Figure 6: Unemployment rate by census district, 2016 (SOURCE: Department of Statistics[11])

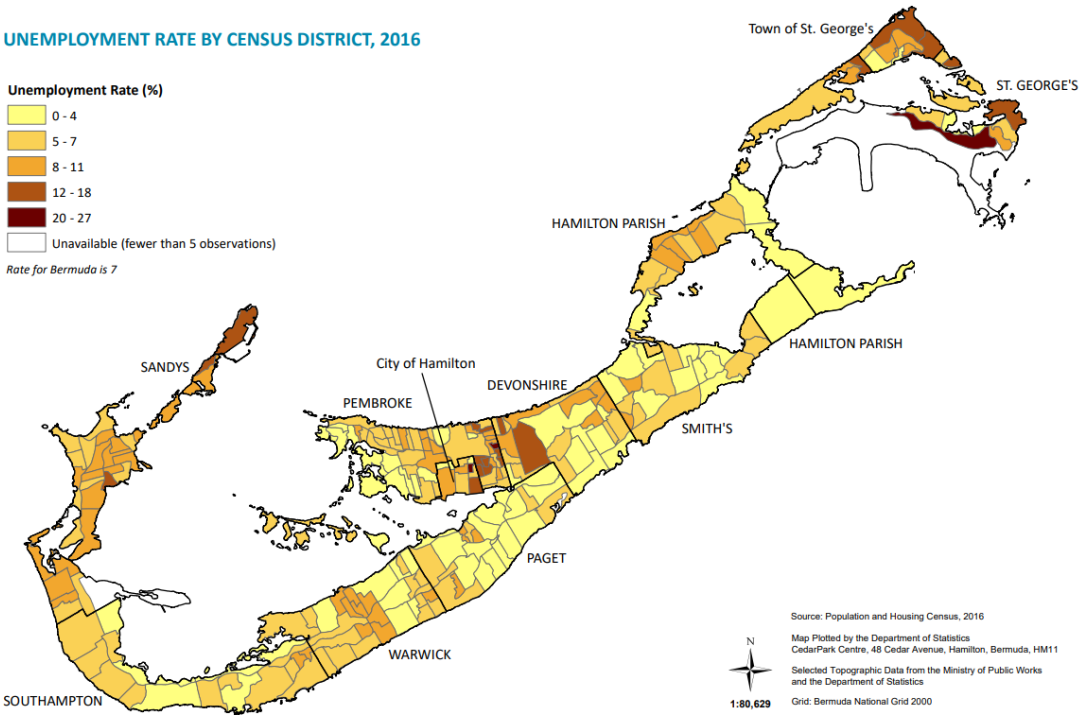


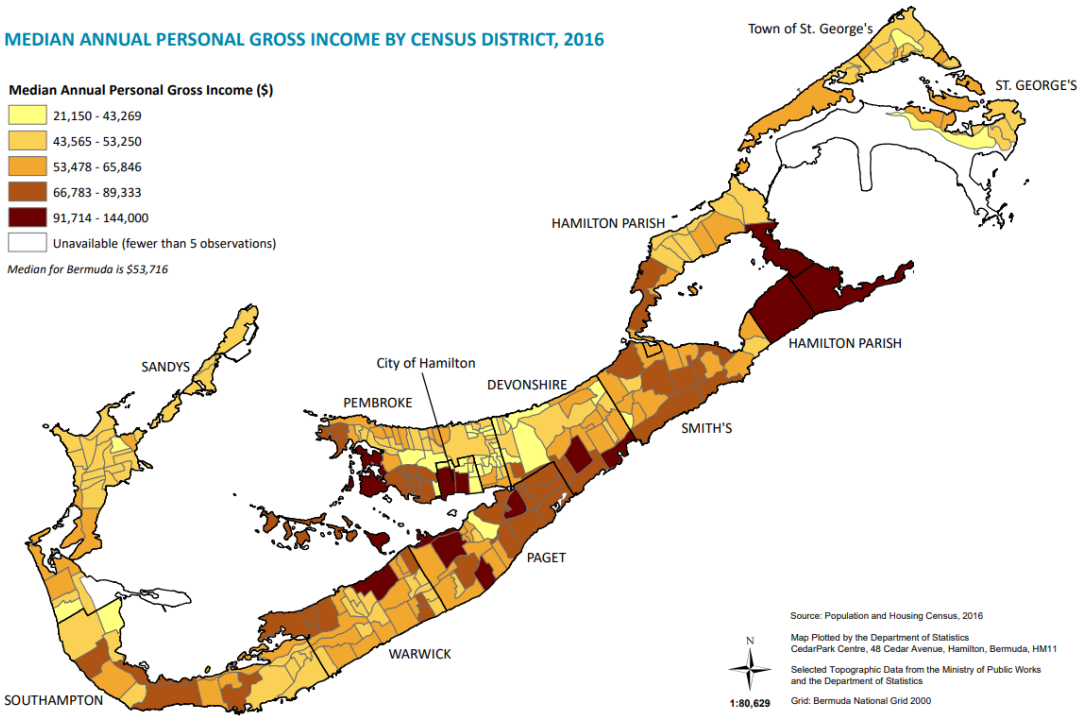
Table 9: Median income from main job, 2020 (SOURCE: Department of Statistics[12])

Population grouping	Median annual income ($)
Total working population	64033.4
Gender	
Male	66878.6
Female	60878.1
Bermudian Status	
Bermudian	61041.7
Non-Bermudian	75890.1
Ethnicity	
Black	58605.2
White	83644.4
Mixed/Other	55521.4
Highest Academic Qualification	
No Formal Certificate	41114.1
High School Certificate	50186.5
Tech. / Voc./ Assoc. / Diploma	56934.8
Degree	93889.7

11 Department of Statistics, Government of Bermuda. 2016 Bermuda Census Maps. Available: https://www.gov.bm/2016-bermuda-census-maps [accessed 1st January 2023].

12 Department of Statistics, Government of Bermuda. Labour Force Survey Report 2020. Available: https://www.gov.bm/sites/default/files/November%202020%20Labour%20Force%20Survey%20%20Report.pdf

Figure 7: Median annual personal gross income by census district, 2016
(SOURCE: Department of Statistics[13])



Education

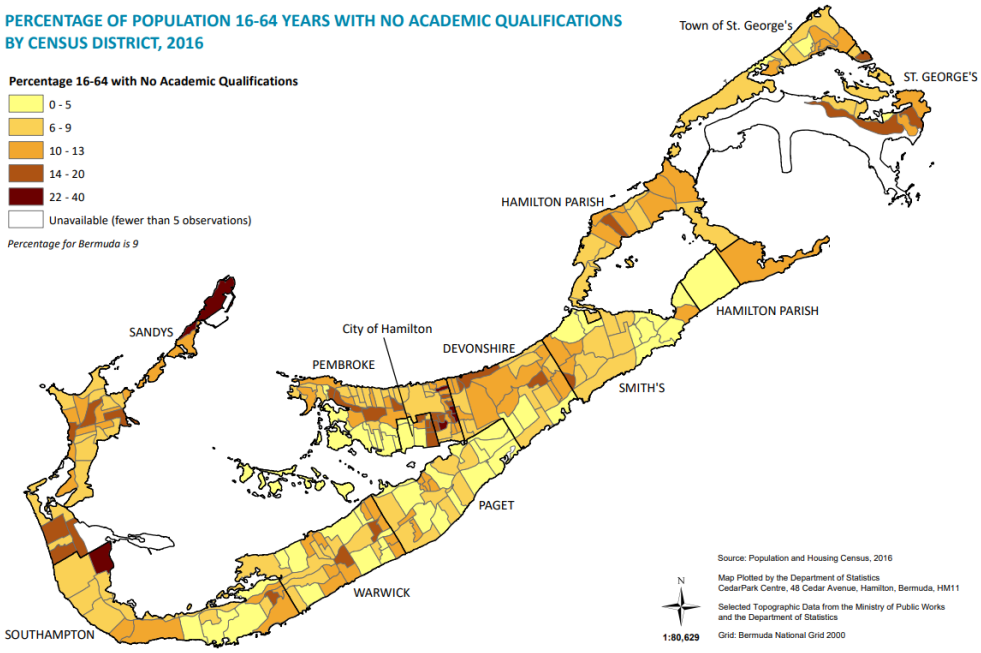
Table 10: Highest academic qualification in the 16+ population, 2016
(SOURCE: Department of Statistics[14])

Academic qualification	Population	Percentage of Total Population
No Formal Certificate	7,283	13.6%
High School Certificate	18,764	35.0%
Tech./ Voc. / Assoc./ Diploma	11,940	22.3%
Degree	15,541	29.0%
Other	1	0.0%
Not Stated	84	0.2%

13 Department of Statistics, Government of Bermuda. 2016 Bermuda Census Maps. Available: https://www.gov.bm/2016-bermuda-census-maps

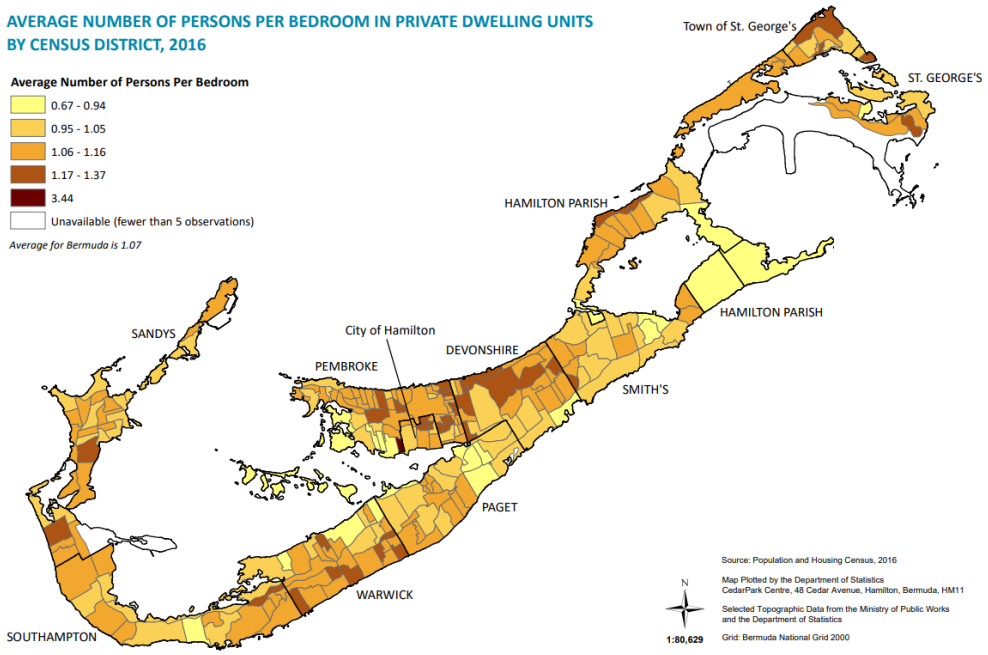
14 Department of Statistics, Government of Bermuda. Population and Housing Census 2016. Available: https://www.gov.bm/sites/default/files/2016%20Census%20Report.pdf

Figure 8: Proportion of the 16-64 year old population with no academic qualification by census district, 2016
(SOURCE: Department of Statistics[15])



Housing

Figure 9: Average number of persons per bedroom by census district, 2016
(SOURCE: Department of Statistics[16])



15 Department of Statistics, Government of Bermuda. 2016 Bermuda Census Maps. Available: https://www.gov.bm/2016-bermuda-census-maps

16 Department of Statistics, Government of Bermuda. 2016 Bermuda Census Maps. Available: https://www.gov.bm/2016-bermuda-census-maps [accessed 1st January 2023].

MORTALITY

Figure 10: Number of deaths 2010-2021
(SOURCE: ESU)

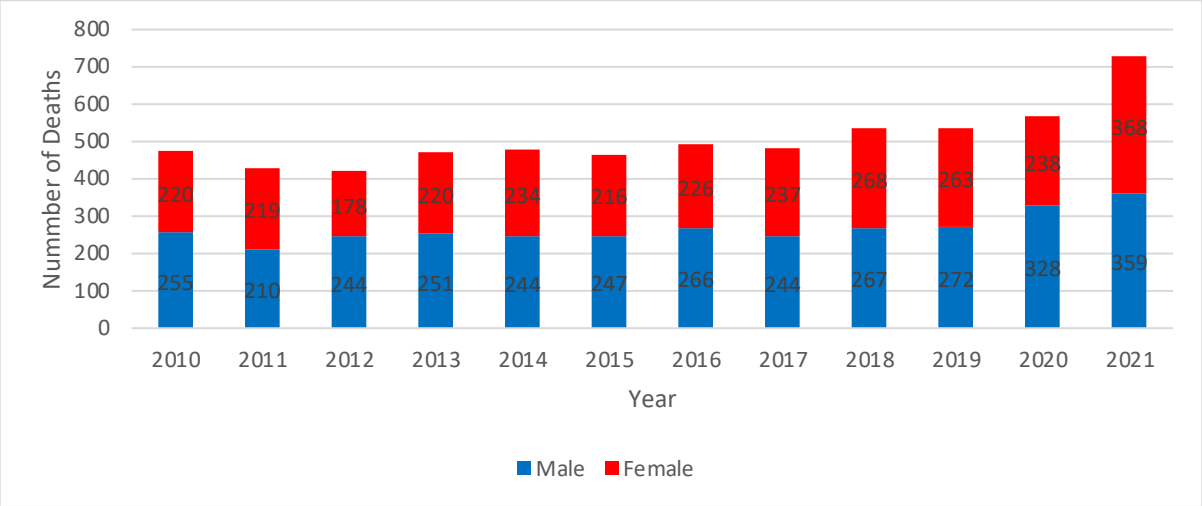


Figure 11: Age-standardised all-cause mortality rates per 100,000 population 2010-2021 with 3 year rolling average trend line
(SOURCE: ESU)

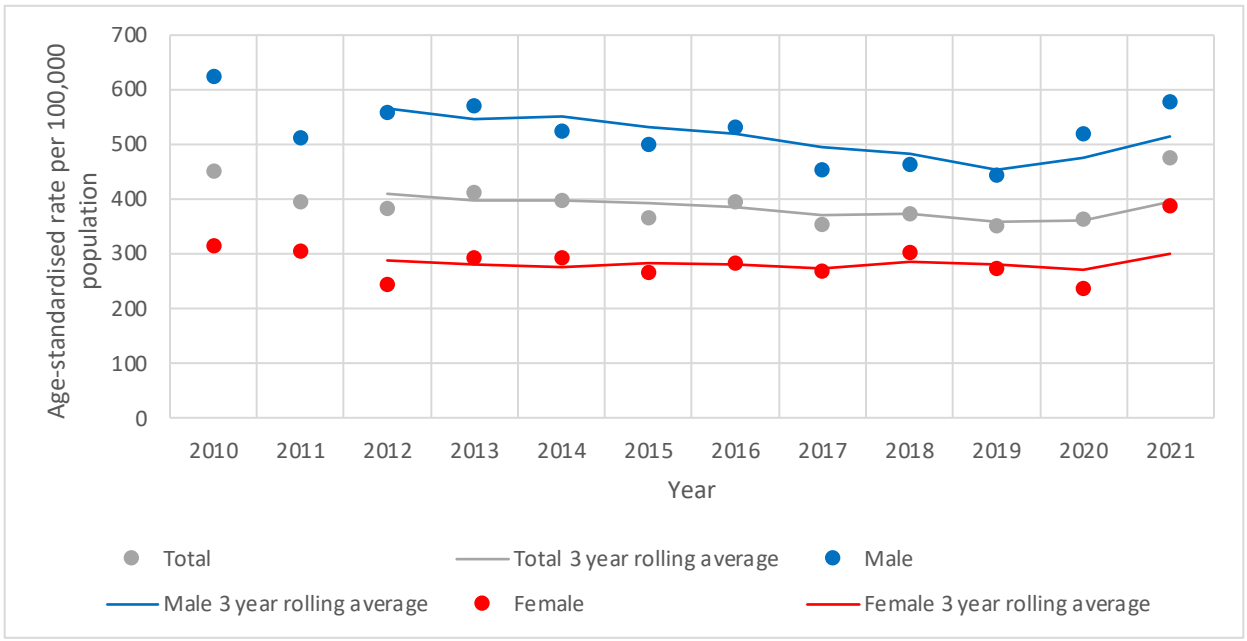


Figure 12: Age-standardised potential years of life lost per 100,000 population OECD Comparison aged 0-75 2020. NB: *Age-standardisation using OECD standard population
(SOURCE: ESU and OECD)

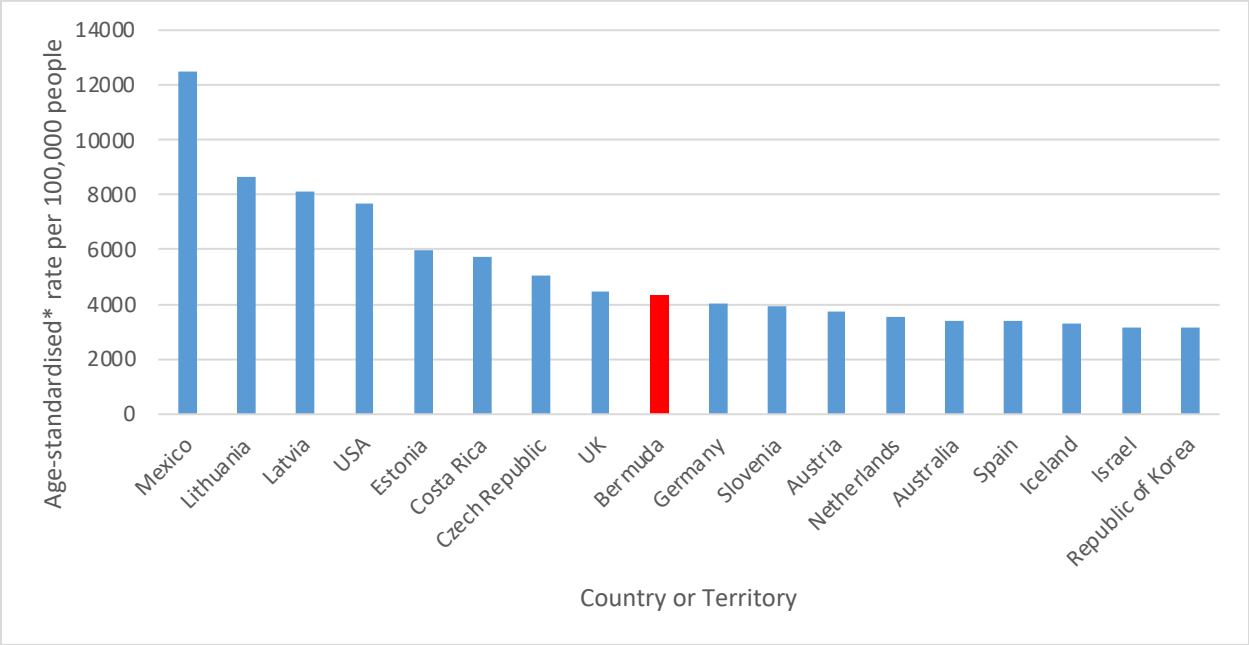


Figure 13: Age-standardised potential years of life lost per 100,000 population aged 0-75 2010-2021 with 3 year rolling average trend line
(SOURCE: ESU)

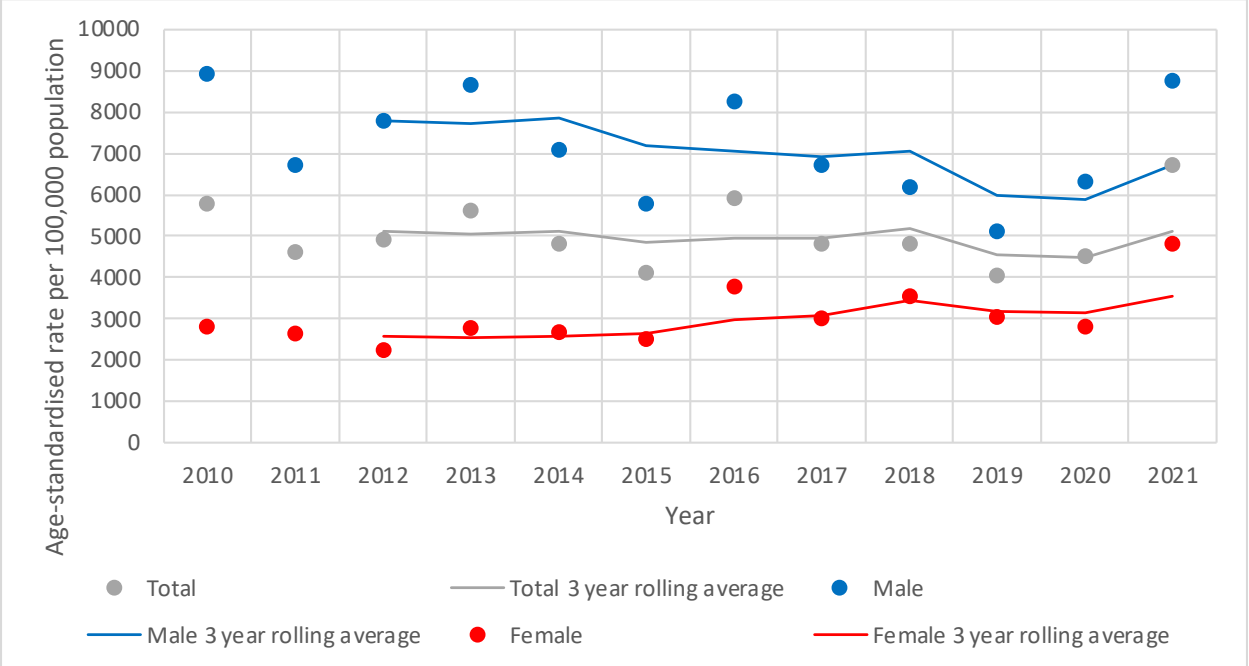


Figure 14: Leading 10 causes of mortality: combined total for 2010-2019 by ICD group (SOURCE: ESU)

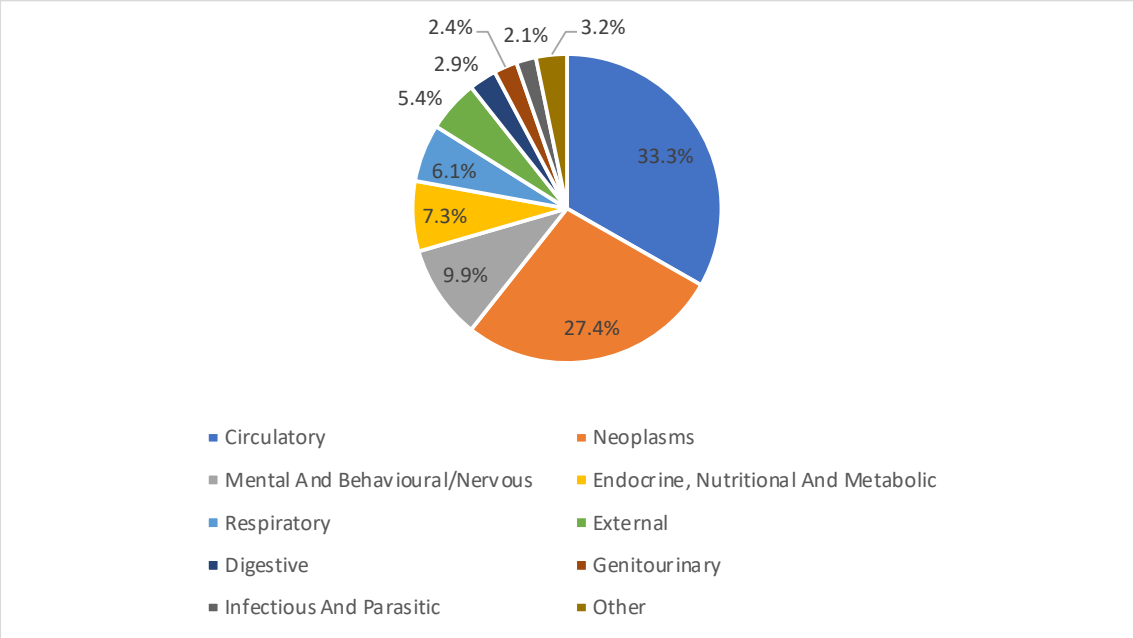
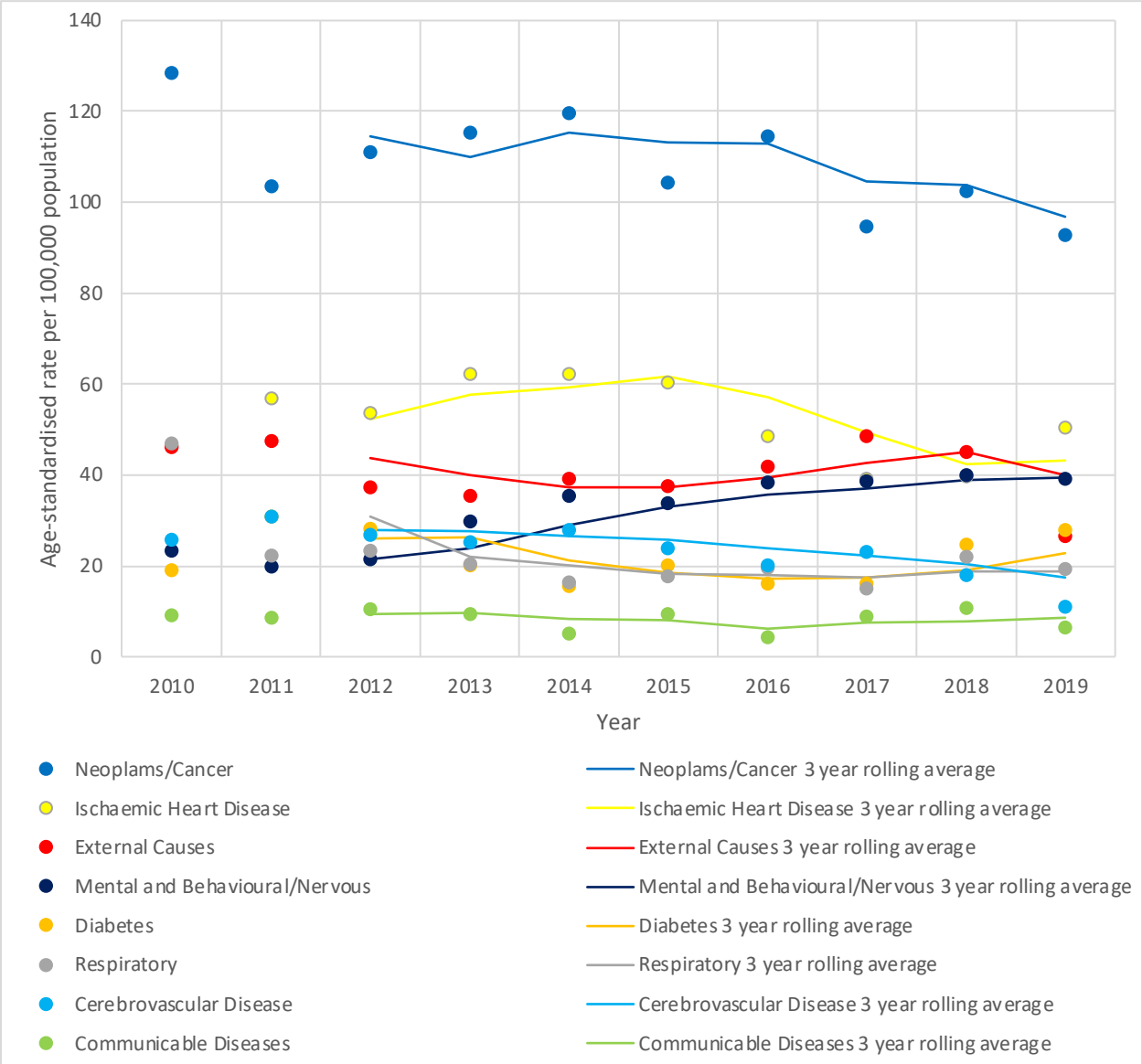


Table 11: Leading 10 causes of mortality 2010-2019 by ICD group (SOURCE: ESU)

Combined 2010-2019 Rank & ICD Group	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
1.Circulatory	29.4%	34.7%	35.6%	34.5%	38.0%	36.9%	33.2%	31.0%	29.1%	31.4%	33.3%
2.Neoplasms	28.4%	26.1%	29.6%	28.6%	30.8%	26.8%	28.2%	25.9%	25.7%	24.8%	27.4%
3.Mental and Behavioural/ Nervous	5.4%	5.6%	6.5%	8.6%	9.8%	9.6%	12.0%	13.2%	12.9%	13.2%	9.9%
4.Endocrine, Nutritional and Metabolic	5.2%	11.0%	8.8%	7.1%	5.2%	7.0%	5.8%	5.9%	7.7%	10.1%	7.3%
5.Respiratory	11.6%	6.1%	6.2%	5.5%	4.4%	4.9%	5.4%	4.3%	6.6%	5.7%	6.1%
6.External	6.4%	6.3%	4.8%	4.2%	5.2%	5.1%	5.2%	6.9%	6.6%	3.7%	5.4%
7.Digestive	5.4%	2.1%	1.8%	2.9%	1.9%	1.8%	2.4%	4.3%	2.7%	3.3%	2.9%
8.Genitourinary	3.1%	3.0%	1.4%	2.1%	2.1%	1.6%	2.6%	3.1%	2.2%	3.1%	2.4%
9.Infectious and Parasitic	2.1%	2.3%	2.3%	2.3%	1.5%	2.7%	1.2%	2.4%	2.2%	1.8%	2.1%
10.Unknown	1.4%	2.1%	0.9%	1.1%	0.0%	0.8%	1.0%	0.6%	1.3%	1.5%	1.1%
11.Blood and Immunity	0.4%	0.0%	0.2%	1.5%	0.4%	1.0%	1.0%	1.0%	1.3%	0.7%	0.8%
12.Musculoskeletal and Nervous System	0.2%	0.5%	0.7%	0.4%	0.6%	0.8%	0.4%	0.8%	0.5%	0.2%	0.5%
13.Perinatal	0.4%	0.2%	0.5%	0.4%	0.2%	0.6%	0.4%	0.0%	0.5%	0.2%	0.3%
14.Skin and Subcutaneous	0.4%	0.0%	0.5%	0.2%	0.0%	0.2%	0.6%	0.6%	0.5%	0.0%	0.3%
15. Congenital	0.2%	0.0%	0.2%	0.6%	0.0%	0.0%	0.6%	0.0%	0.2%	0.4%	0.2%

Figure 15: Age-standardised mortality rates for leading causes of mortality per 100,000 population 2010-2019 with 3 year rolling average trend line (SOURCE: ESU)



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Communicable Diseases

Table 12: Number of annual cases of Vaccine-preventable diseases (notified to ESU 2010-2022)

(SOURCE: ESU)

Year / Disease	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Chicken pox (varicella)	43	20	13	27	25	28	15	22	10	17	10	9	9
Congenital Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0
COVID-19			...	...	...	...	...	...	...	...	612	6055	
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza	11	25	37	29	38	20	75	154	93	145	186	68	110
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis (due to H. influenzae)	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis (due to S. pneumoniae)	..	...	...	...	0	0	0	0	1	0	0	0	0
Meningococcal infection (due to Neisseria meningitidis)	0	0	0	1	0	0	0	0	0	0	0	0	0
Mumps	2	3	0	0	0	0	0	0	0	2	0	0	0
Pertussis (whooping cough)	0	1	3	0	0	3	0	2	2	2	8	0	0
Pneumonia (due to H. influenzae)	0	0	0	0	0	0	0	0	1	6	2	0	0
Pneumonia (due to S. pneumoniae)	..	...	...	...	5	6	2	6	5	11	4	12	1
Respiratory syncytial virus (RSV)			11	38	34	9	8	24	43	19	66	56	104
Rubella (German measles)	0	0	0	0	0	0	0	0	0	0	0	0	0
Tetanus (excl. neonatal)	0	0	0	0	0	0	0	0	0	0	0	0	1
Tetanus (neonatal)	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis (extra-pulmonary)*	0	0	1	0	0	0	0	1	0	0	0	0	1
Tuberculosis (pulmonary)*	1	1	2	0	0	1	1	2	2	2	2	2	2

Table 13: Number of annual cases of Vector-borne diseases (notified to ESU 2010-2022)

(SOURCE: ESU)

Year / Disease	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Chikungunya*	..	...	...	...	3	0	1	0	0	0	0	0	0
Dengue Fever*	2	1	0	0	1	0	0	0	0	2	0	0	0
Leptospirosis	0	0	0	0	0	0	0	0	0	0	0	0	0
Malaria*	0	2	0	0	2	1	2	1	2	1	0	0	0
Zika*	..	...	...	...	...	...	5	1	0	1	0	0	0

Table 14: Number of annual cases of Food and water-borne diseases (notified to ESU 2010-2022)

(SOURCE: ESU)

Year / Disease	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Campylobacter	19	19	30	27	17	17	11	20	21	41	66	62	37
Ciguatera	0	0	0	0	0	0	10	1	15	5	0	1	0
Cryptosporidium	..	...	...	...	0	0	0	4	5	4	4	2	8
Giardia	..	...	...	...	0	1	1	9	9	7	5	5	4
Listeria	..	...	...	...	0	0	1	1	0	1	0	1	0
Norovirus	2	3	19	1	1	2	7	1	2	6	3	5	9
Rotavirus	8	13	3	6	3	6	7	16	18	15	9	8	7
Salmonellosis	40	14	60	61	95	70	71	56	65	73	38	44	42
Shigellosis	3	3	4	2	1	1	0	1	1	3	1	3	1
Typhoid and para-typhoid fevers	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 15: Number of annual cases of other diseases of public health interest (notified to ESU 2010-2022)

(SOURCE: ESU)

Year / Disease	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hepatitis A	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis B	1	0	2	1	8	5	4	8	6	2	3	2	0
Hepatitis C	28	14	13	18	8	8	6	8	8	7	1	1	0
Leprosy (Hansen's Disease)*	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies (in humans)	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 16: Number of annual cases of Sexually Transmitted Infections (notified to ESU 2010-2022)

(SOURCE: ESU)

Year / Disease	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Chlamydia	431	332	380	322	312	356	416	334	384	357	262	216	207
Genital herpes	40	30	61	70	72	92	181	78	46	70	47	45	62
Gonorrhoea	31	68	65	40	25	27	14	47	61	22	22	23	20
HIV	11	8	6	7	7	5	6	0	5	3	4	5	3
Syphilis	3	1	10	11	7	8	2	3	3	6	3	4	2

COVID-19

Figure 16: Cases of COVID-19 by Epidemiological Week (notified to ESU 2020-2022)
(SOURCE: ESU)

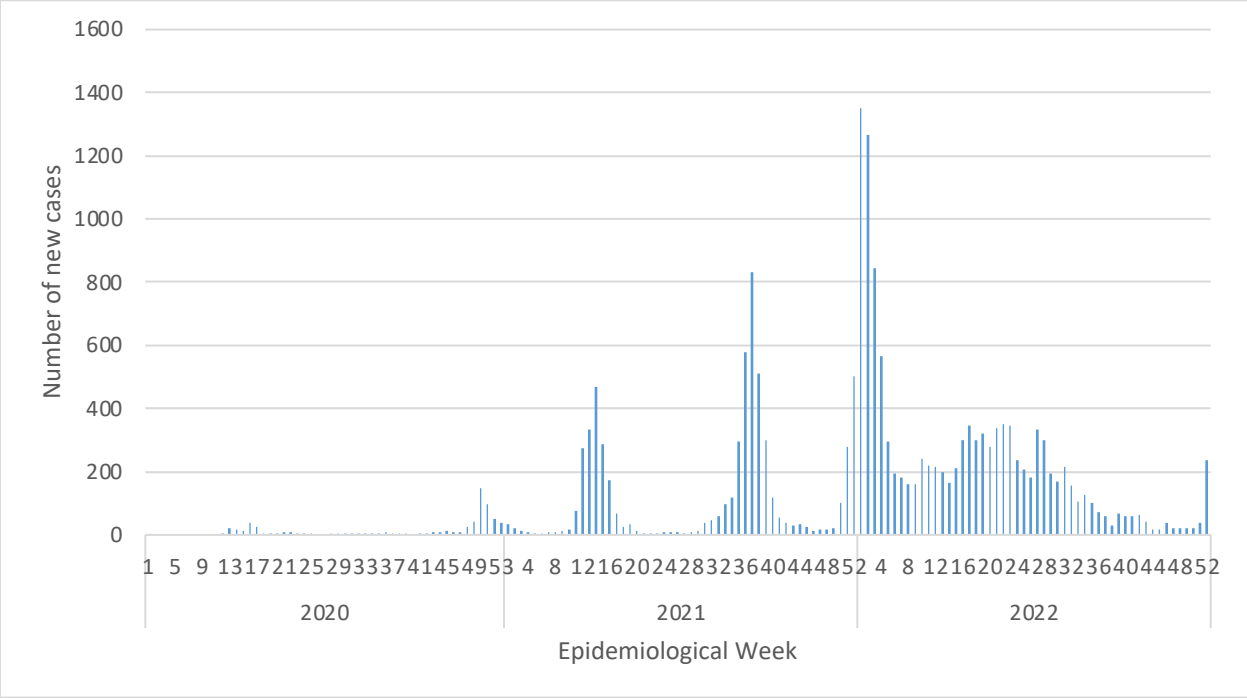


Figure 17: Admissions to Hospital with a positive COVID-19 test in the past 28 days by Epidemiological Week (notified to ESU 2020-2022)
(SOURCE: ESU)

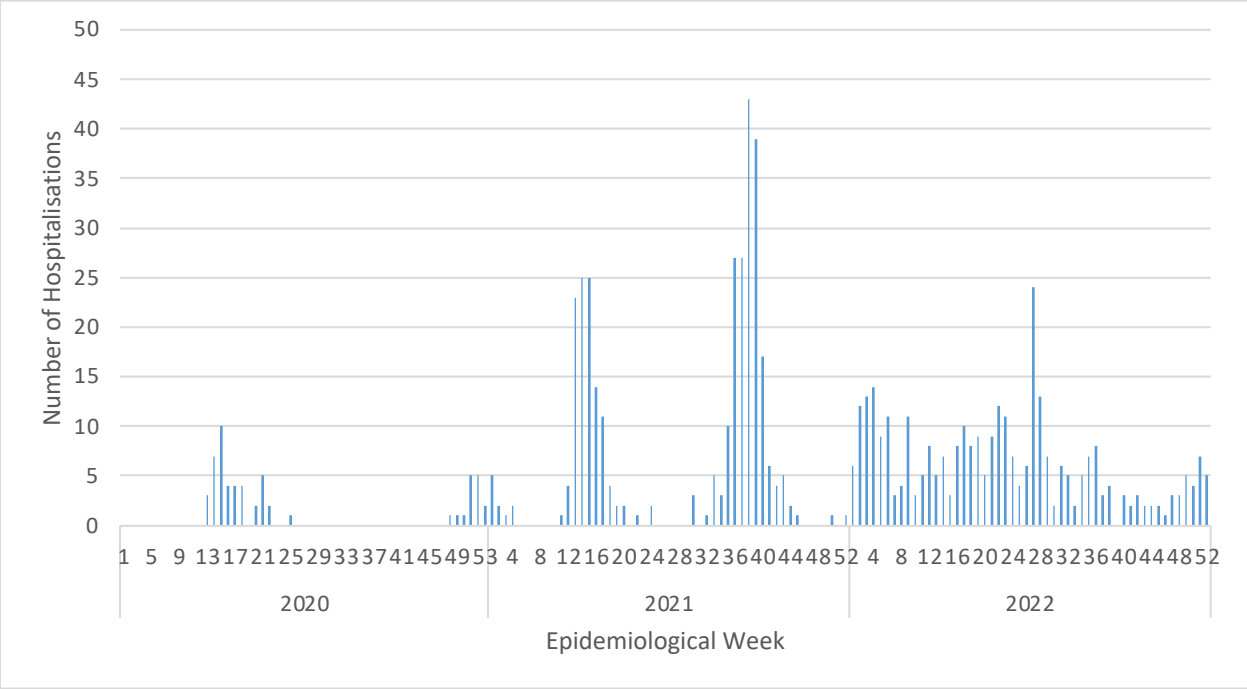


Figure 18: Deaths with a positive COVID-19 test in the past 28 days by Epidemiological Week (notified to ESU 2020-2022)
(SOURCE: ESU)

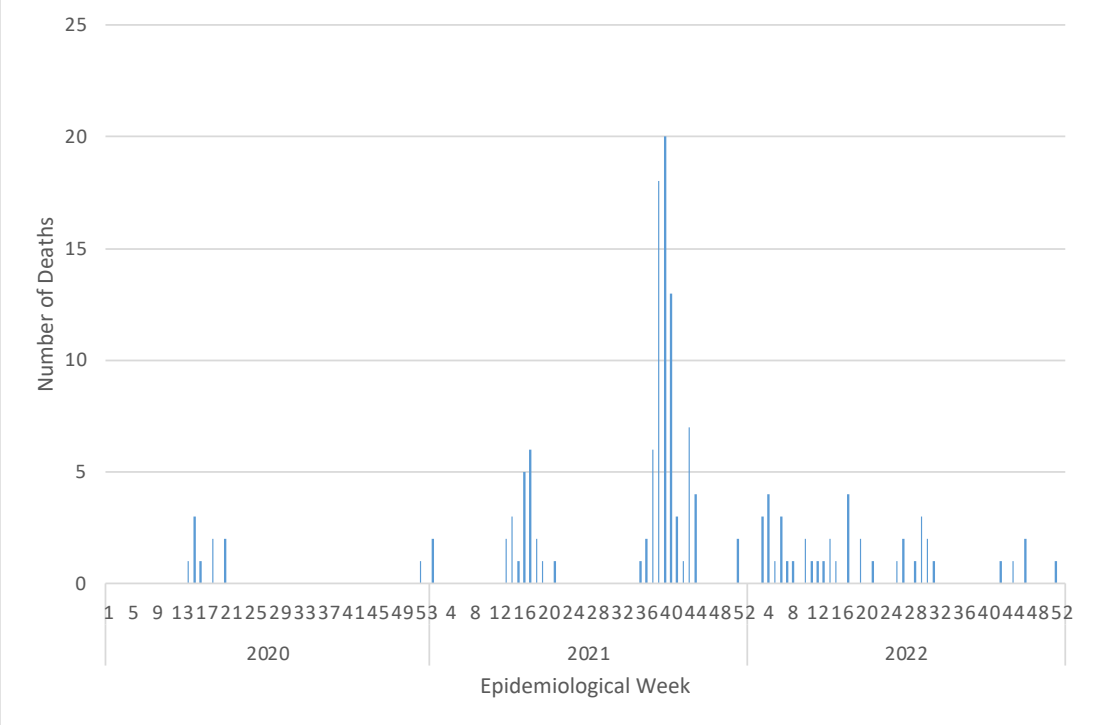


Figure 19: Weekly COVID-19 vaccines doses given (split by dose) 27th December 2021 – 31st December 2022
(SOURCE: Government of Bermuda's Pandemic Administration System)

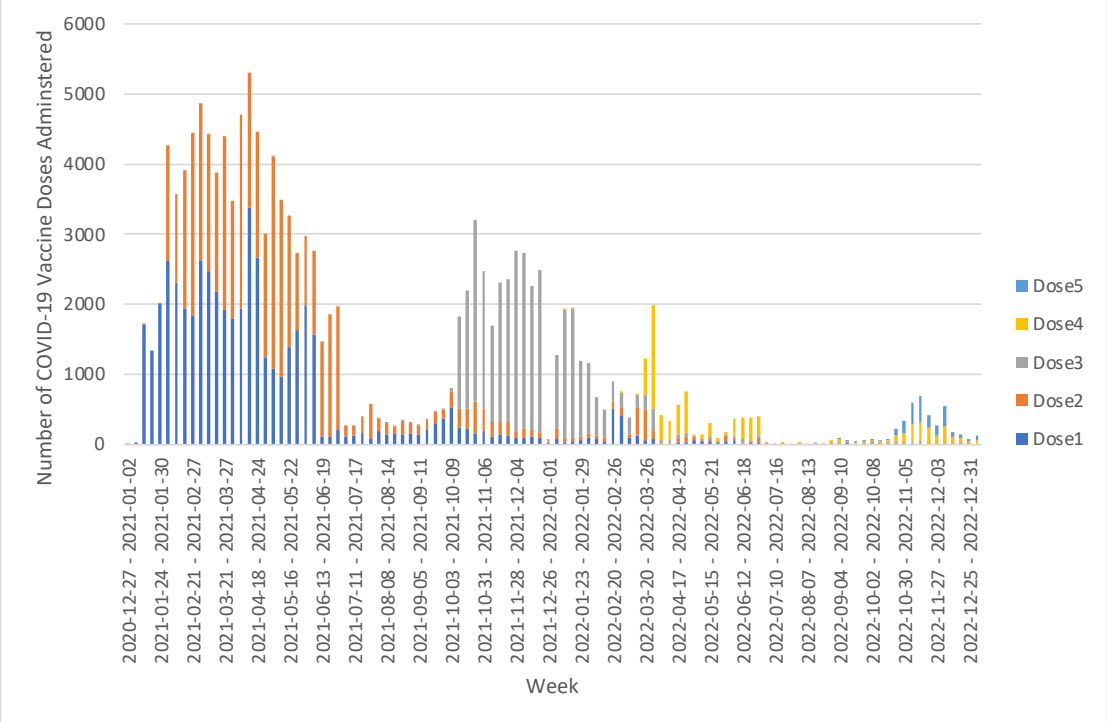


Figure 20: Weekly COVID-19 vaccines cumulative doses given (split by dose)
27th December 2021 – 31st December 2022
(SOURCE: Government of Bermuda's Pandemic Administration System)

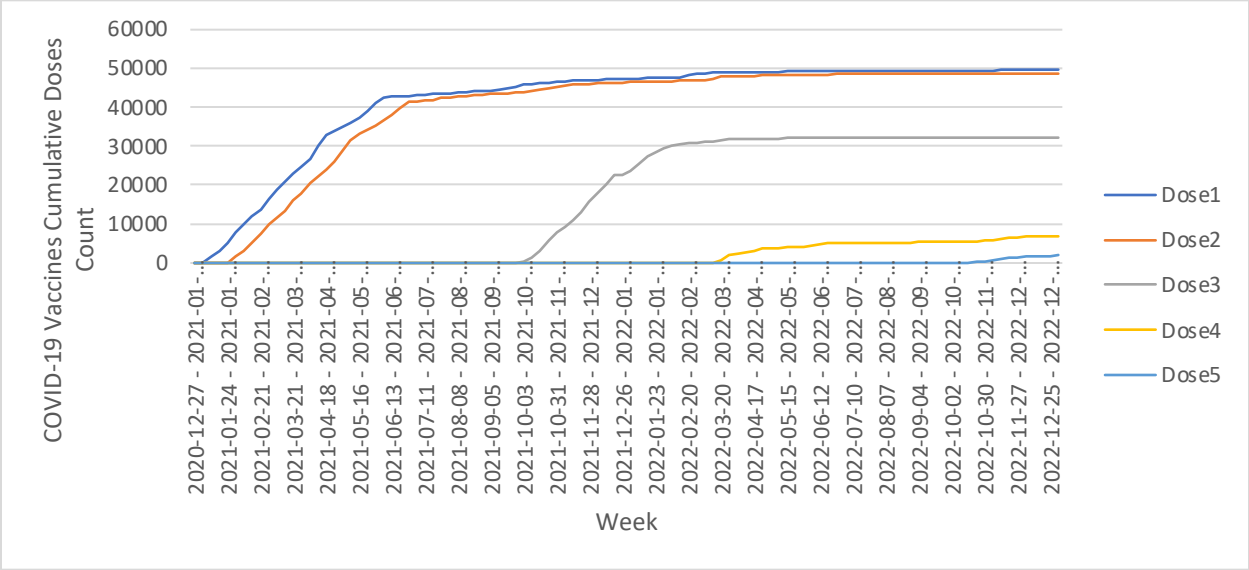


Figure 21: COVID-19 vaccines coverage by age and gender
(SOURCE: Government of Bermuda's Pandemic Administration System)

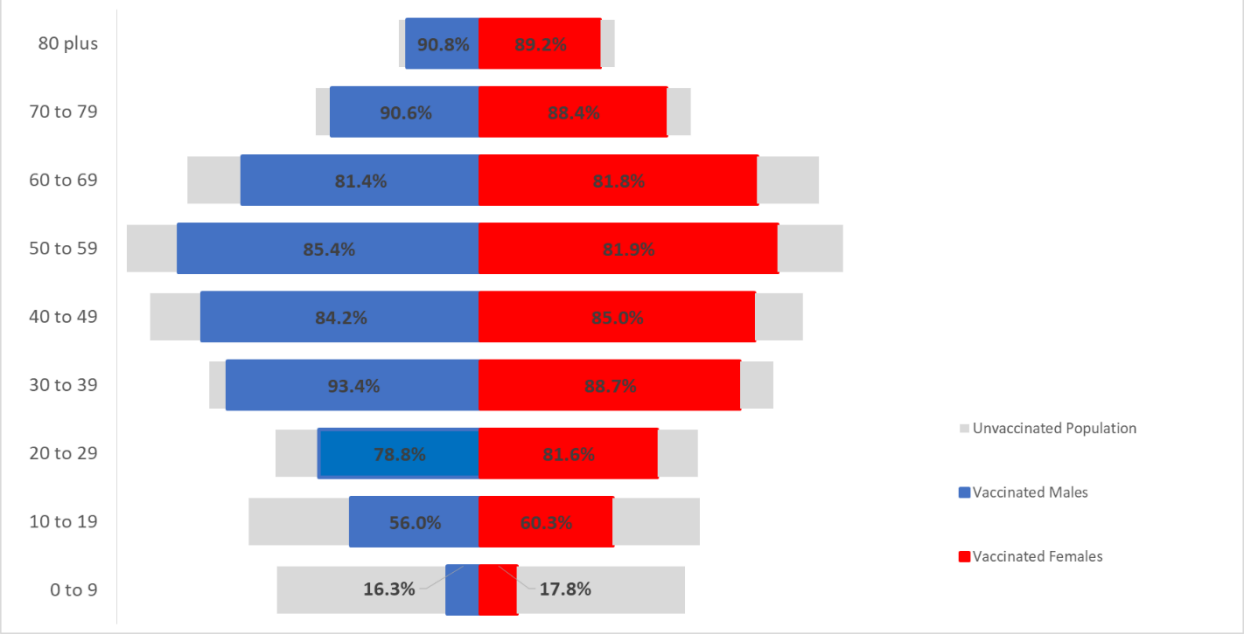


Figure 22: Spatial distribution of vaccinated persons, December 2021
(SOURCE: Locus Limited)
(using data from Government of Bermuda's Pandemic Administration System and 2016 census)

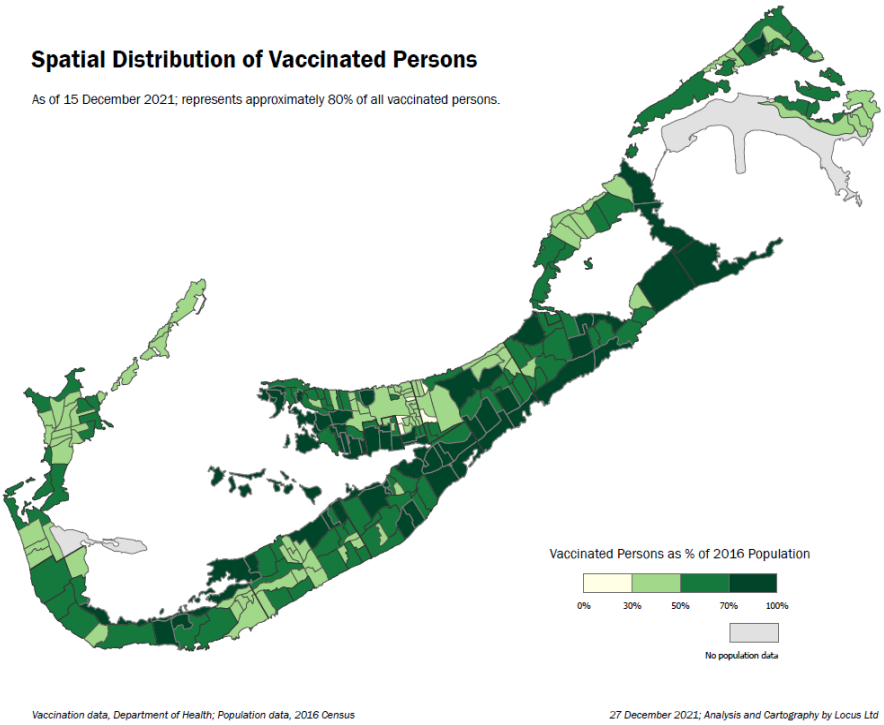
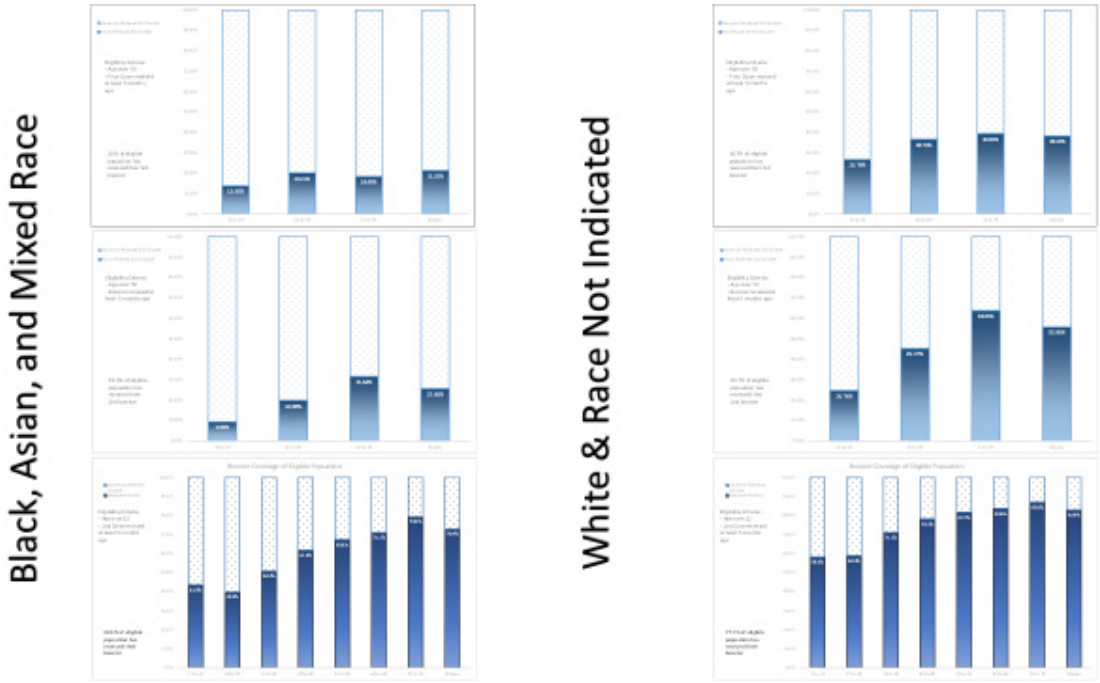


Figure 23: Spatial distribution of vaccinated persons, December 2021
(SOURCE: Government of Bermuda's Pandemic Administration System)



Non-Communicable Diseases

Table 17: Total insurance claims for leading causes of adult physical disease burden (SOURCE: Bermuda Health Council's Cost and Utilisation Data)

2021 Rank	Diagnosis	Total Number of Claims				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Diabetes	45979	36198	37579	34248	43930
2	Cancer	15245	35975	44248	33835	33520
3	Low Back Pain	12711	19797	19332	18263	17159
4	Chronic Kidney Disease	31971	21399	20344	15817	16673
5	Gynaecological disease	4498	1027	3014	6651	10875
6	Heart Disease	2662	4916	5240	5873	7165
7	Obesity	8325	10506	7374	5746	5956
8	Skin Disease	2265	3226	2967	3171	4440
9	Headache include migraine	3234	1537	2284	1809	3552
10	Stroke	4884	6134	8037	5621	3417
11	Asthma/COPD	4124	4429	4149	3298	2977
12	Hypertension	8194	6847	7996	7366	2258
13	Other Musculoskeletal	11890	7187	9450	6380	1872
14	COVID-19					1043
15	Upper respiratory tract infection	3532	4537	3853	3637	973
16	Arthrosis	1245	906	796	600	352
17	Hearing Loss	211	177	185	301	165
18	Falls	66	104	34	34	145

Table 18: Total insurance claims paid for leading causes of adult physical disease burden (SOURCE: Bermuda Health Council's Cost and Utilisation Data)

2021 Rank	Diagnosis	Total Paid for Claimed Services				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Cancer	$6,050,441.95	$12,502,938.40	$16,309,391.90	$14,060,613.70	$12,137,916.00
2	Chronic Kidney Disease	$16,029,180.10	$6,421,700.60	$4,421,724.09	$5,352,591.47	$5,158,559.66
3	Diabetes	$6,334,446.66	$3,627,838.91	$3,322,119.57	$3,252,003.50	$3,517,748.74
4	Heart Disease	$1,350,058.16	$2,809,861.44	$3,267,365.42	$4,277,101.83	$3,393,479.02
5	Low Back Pain	$2,444,214.39	$2,429,714.49	$2,632,211.46	$2,255,246.84	$1,722,873.15
6	Gynaecological disease	$563,686.78	$160,719.59	$500,405.64	$570,828.61	$1,299,290.75
7	Other Musculoskeletal	$2,615,459.28	$1,739,127.95	$2,237,460.16	$1,618,515.07	$987,761.64
8	Stroke	$2,193,628.84	$2,018,009.62	$2,222,567.97	$2,310,114.37	$834,999.36
9	Obesity	$770,225.44	$919,085.43	$655,415.04	$684,203.25	$653,694.35
10	Headache include migraine	$860,455.24	$214,560.02	$383,637.90	$420,193.67	$519,177.59
11	Skin Disease	$302,235.22	$348,103.78	$331,928.13	$413,847.07	$513,589.43

12	Asthma/COPD	$1,091,652.30	$952,157.07	$679,273.92	$467,734.81	$373,584.32
13	Hypertension	$754,866.61	$574,063.64	$773,134.23	$668,391.59	$217,081.38
14	COVID-19					$106,630.89
15	Upper respiratory tract infection	$375,013.37	$506,791.45	$407,398.90	$368,858.74	$77,023.66
16	Hearing Loss	$115,881.03	$64,349.24	$95,893.15	$91,871.85	$52,472.08
17	Arthrosis (Osteoarthritis)	$131,896.98	$60,414.51	$73,365.90	$51,386.63	$32,527.90
18	Falls	$21,573.67	$4,797.75	$2,123.37	$8,825.52	$12,843.50

Table 19: Total insurance claims for leading causes of adult mental health burden (SOURCE: Bermuda Health Council's Cost and Utilisation Data)

Note: *Data has been removed due to the reporting of small numbers to protect privacy

2021 Rank	Diagnosis	Total Claims				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Panic/anxiety	745	1682	1680	2841	6687
2	Other disorders	5071	5241	7463	6626	4789
3	Adjustment disorder	1549	2557	3383	4216	3816
4	Depression disorder	1913	2484	3042	2880	3399
5	Schizophrenia	1448	2374	1922	2189	2268
6	Bipolar disorder	517	1686	2178	2309	1218
7	ADD/ADHD	83	493	629	905	703
8	Drug disorder	816	1363	2054	2179	443
9	PTSD	*	93	153	156	382
10	Eating disorder	*	216	289	273	307

Table 20: Total insurance claims paid for leading causes of adult mental health burden (SOURCE: Bermuda Health Council's Cost and Utilisation Data)

Note: *Data has been removed due to the reporting of small numbers to protect privacy

2021 Rank	Diagnosis	Total Paid for Claimed Services				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Dementia	$14,015.73	$1,055,130.09	$1,584,011.70	$1,625,890.43	$1,261,520.63
2	Panic/anxiety	$100,611.01	$174,554.27	$220,090.76	$420,189.88	$953,141.45
3	Schizophrenia	$547,241.70	$619,222.60	$1,218,834.25	$994,972.62	$797,803.60
4	Other disorders	$743,375.68	$721,740.84	$2,739,687.52	$1,014,521.41	$608,294.73
5	Depression disorder	$340,986.63	$269,406.21	$426,913.55	$409,100.59	$588,457.77
6	Adjustment disorder	$182,025.80	$284,567.02	$434,003.72	$490,816.11	$475,927.30
7	Bipolar disorder	$152,492.10	$336,742.71	$424,775.44	$371,763.51	$306,523.96
8	Eating disorder	*	$32,492.85	$41,474.68	$37,217.29	$159,482.12
9	PTSD	*	$11,061.16	$22,014.40	$34,759.35	$104,766.67
10	Drug disorder	$496,420.90	$355,511.28	$530,738.50	$526,986.49	$98,546.20

Table 21: Total insurance claims for leading causes of paediatric physical disease burden
(SOURCE: Bermuda Health Council's Cost and Utilisation Data)
Note: *Data has been removed due to the reporting of small numbers to protect privacy

2021 Rank	Diagnosis	Total Paid for Claimed Services				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Ear Nose and Throat Conditions	794	1226	1468	1201	1205
2	Upper respiratory tract infection	2777	4897	4475	5115	922
3	Asthma/COPD	237	489	507	482	205
4	Diabetes	162	80	147	178	146
5	Cancer	72	92	61	140	123
6	Obesity	192	105	136	234	64
7	COVID-19					41
8	Epilepsy	59	113	77	74	28
9	Gastroenteritis	235	119	146	77	27
10	Lower respiratory tract infection	*	*	*	*	*

Table 22: Total insurance claims paid for leading causes of paediatric physical disease burden
(SOURCE: Bermuda Health Council's Cost and Utilisation Data)
Note: *Data has been removed due to the reporting of small numbers to protect privacy

2021 Rank	Diagnosis	Total Paid for Claimed Services				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Ear Nose and Throat Conditions	$111,743.06	$130,235.68	$169,105.15	$164,770.57	$129,977.84
2	Upper respiratory tract infection	$197,279.69	$355,759.38	$338,191.87	$423,746.60	$64,098.90
3	Cancer	$152,869.83	$44,077.06	$46,312.71	$100,400.25	$49,001.72
4	Asthma/COPD	$30,160.87	$48,903.56	$60,608.82	$45,544.82	$18,934.53
5	Diabetes	$23,184.38	$12,792.02	$23,240.08	$25,527.51	$13,312.57
6	Obesity	$17,501.82	$11,318.40	$13,407.38	$25,084.48	$7,858.40
7	Epilepsy	$9,881.81	$77,040.64	$18,293.17	$14,434.46	$4,957.52
8	Gastroenteritis	$54,249.78	$34,550.76	$23,187.11	$14,643.55	$3,208.08
9	COVID-19					$2,583.70
10	Lower respiratory tract infection	*	*	*	*	*

Table 23: Total insurance claims for leading causes of paediatric mental health burden
(SOURCE: Bermuda Health Council's Cost and Utilisation Data)
Note: *Data has been removed due to the reporting of small numbers to protect privacy

2021 Rank	Service	Total Claims				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Other disorders	1563	3820	4672	4654	3163
2	Panic/anxiety	219	484	1166	1327	2108
3	ADD/ADHD	138	331	457	649	899
4	Autistic disorder	31	95	231	441	512
5	Adjustment disorder	296	754	702	556	418
6	Eating disorder		17	159	160	231
7	Depression disorder	128	189	322	293	195

8	Dementia		*	12	139	194
9	OCD		*	27	10	110
10	Phobias	*	16	27	66	57

Table 24: Total insurance claims paid for leading causes of paediatric mental health burden (SOURCE: Bermuda Health Council's Cost and Utilisation Data)

Note: *Data has been removed due to the reporting of small numbers to protect privacy

2021 Rank	Service	Total Paid for Claimed Services				
		FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
1	Other disorders	$197803.8	$363,205.59	$501,834.95	$481,119.51	$319,340.10
2	Panic/anxiety	$29,784.51	$66,625.10	$201,069.48	$196,824.36	$290,239.15
3	ADD/ADHD	$20,451.67	$118,307.17	$161,335.60	$124,198.29	$134,422.43
4	Eating disorder		$2,505.00	$54,460.83	$55,169.41	$95,804.82
5	Autistic disorder	$2,799.70	$43,791.42	$72,801.19	$114,070.21	$74,913.13
6	Adjustment disorder	$35,791.00	$86,055.15	$85,779.53	$61,924.38	$50,099.00
7	Depression disorder	$20,744.67	$20,432.63	$45,775.96	$35,395.97	$24,543.34
8	Dementia		*	$1,135.00	$16,450.00	$23,753.00
9	Gender disorder[17]			$570.00	$2,029.75	$22,549.35
10	OCD		*	$7,648.40	$1,500.00	$13,315.00

Table 25: Annual percentage coverage of Routine Immunisations for Children

(SOURCE: Department of Health – Extended Programme of Immunisations)

Vaccine	% Coverage by Year			
	2018	2019	2020	2021
Rotavirus, 1st dose	87	93	89	86
Rotavirus, last dose	75	87	83	101
DTP-containing vaccine, 1st dose	91	100	93	96
DTP-containing vaccine, 2nd dose	92	100	93	102
DTP-containing vaccine, 3rd dose	95	98	89	108
Diphtheria-containing vaccine, 4th dose (1st booster)	76	90	84	88
Diphtheria-containing vaccine, 5th dose (2nd booster)	64	77	65	65
Diphtheria-containing vaccine, 6th dose (3rd booster)	67	91	85	ND
Tetanus-containing vaccine, 4th dose (1st booster)	76	90	84	88
Tetanus-containing vaccine, 5th dose (2nd booster)	64	69	65	65
Tetanus-containing vaccine, 6th dose (3rd booster)	67	91	85	No data
Pertussis-containing vaccine, 4th dose (1st booster)	76	90	84	88
Hib3	95	96	87	71
Polio, 1st dose	91	100	93	96
Polio, 2nd dose	92	101	93	102
Polio, 3rd dose	95	98	89	108

17 Bermuda's insurance claim data is based on coding using previous versions of ICD, which used the term 'gender disorder'. The authors note that ICD-11 has revised language on gender-identity health to reflect modern understanding of sexual health and gender identity. Further information can be found at: WHO. Gender incongruence and transgender health in the ICD. Not dated (accessed 20th February 2023). Available: https://www.who.int/standards/classifications/frequently-asked-questions/gender-incongruence-and-transgender-health-in-the-icd

Polio, 4th dose	76	90	84	88
Pneumococcal conjugate vaccine, 1st dose	90	99	94	94
Pneumococcal conjugate vaccine, 2nd dose	91	97	91	102
Pneumococcal conjugate vaccine, final dose	94	96	92	105
HepB3	78	97	89	100
Measles-containing vaccine, 1st dose	87	108	99	92
Measles-containing vaccine, 2nd dose	70	102	74	65
Rubella-containing vaccine, 1st dose	87	108	99	92
Varicella	98	98	89	108
HPV Female (final dose)	No consistent data available			52
HPV Male (final dose)	No consistent data available			52

National Tumour Registry Data

Figure 24: Number of new cancer registrations 2012-2021
(SOURCE: Bermuda National Tumour Registry, Bermuda Hospitals Board)
Note: Data includes all carcinomas (invasive, in-situ and skin)

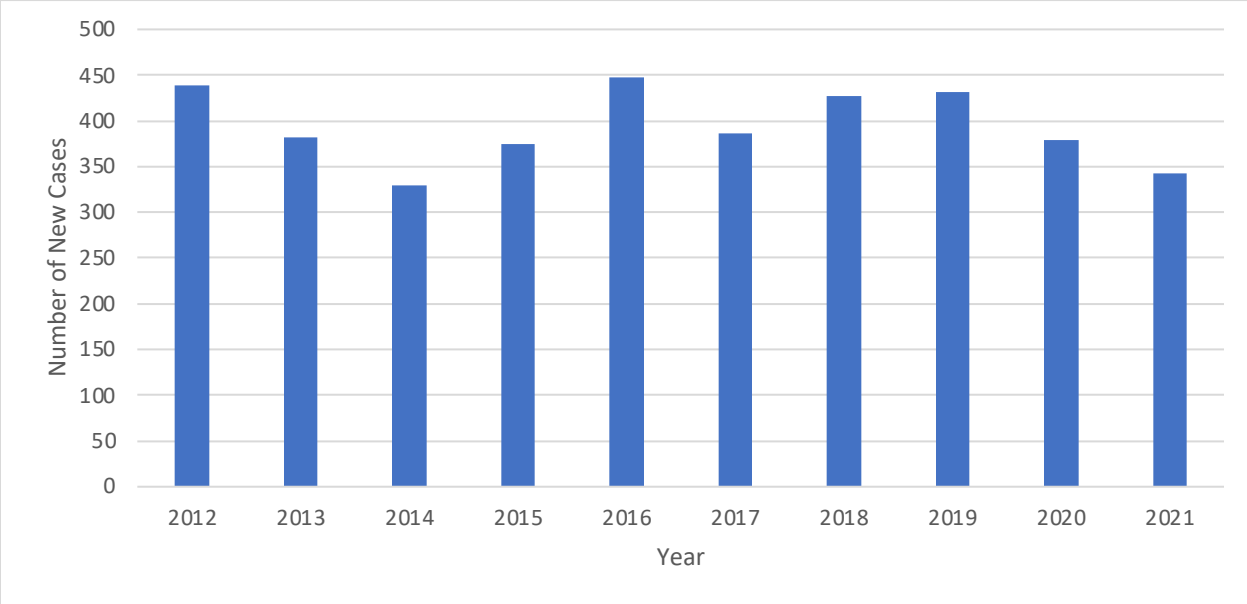


Figure 25: Number of new cancer registrations and age-specific incidence rates (per 100,000), 2010-2019
(SOURCE: Bermuda Cancer and Health Centre[18]).
Note: Non-melanoma skin cancer and in-situ carcinoma excluded

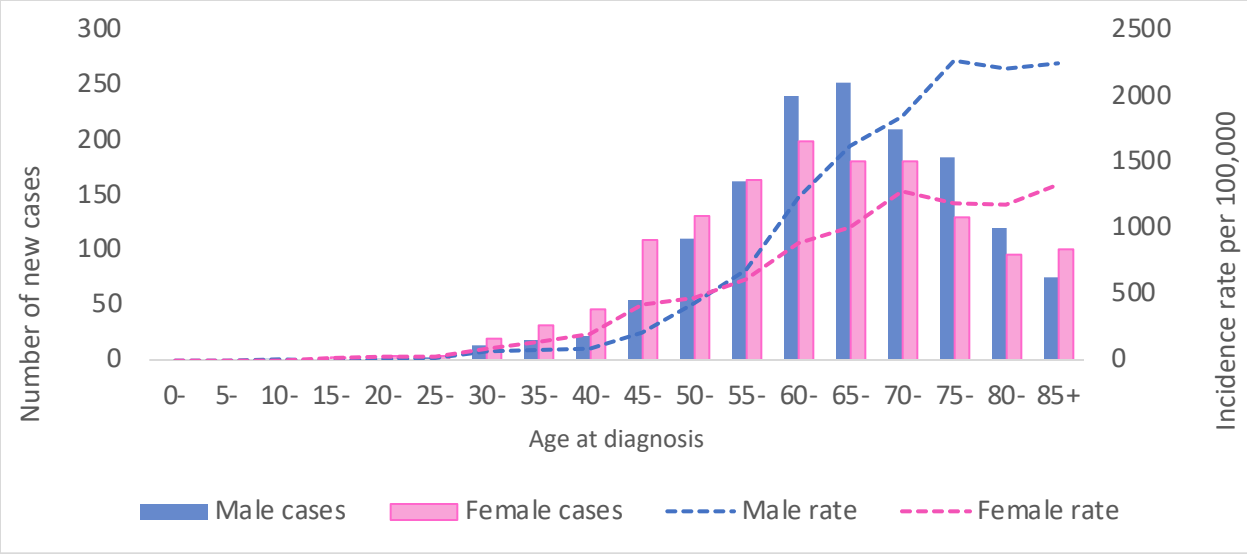
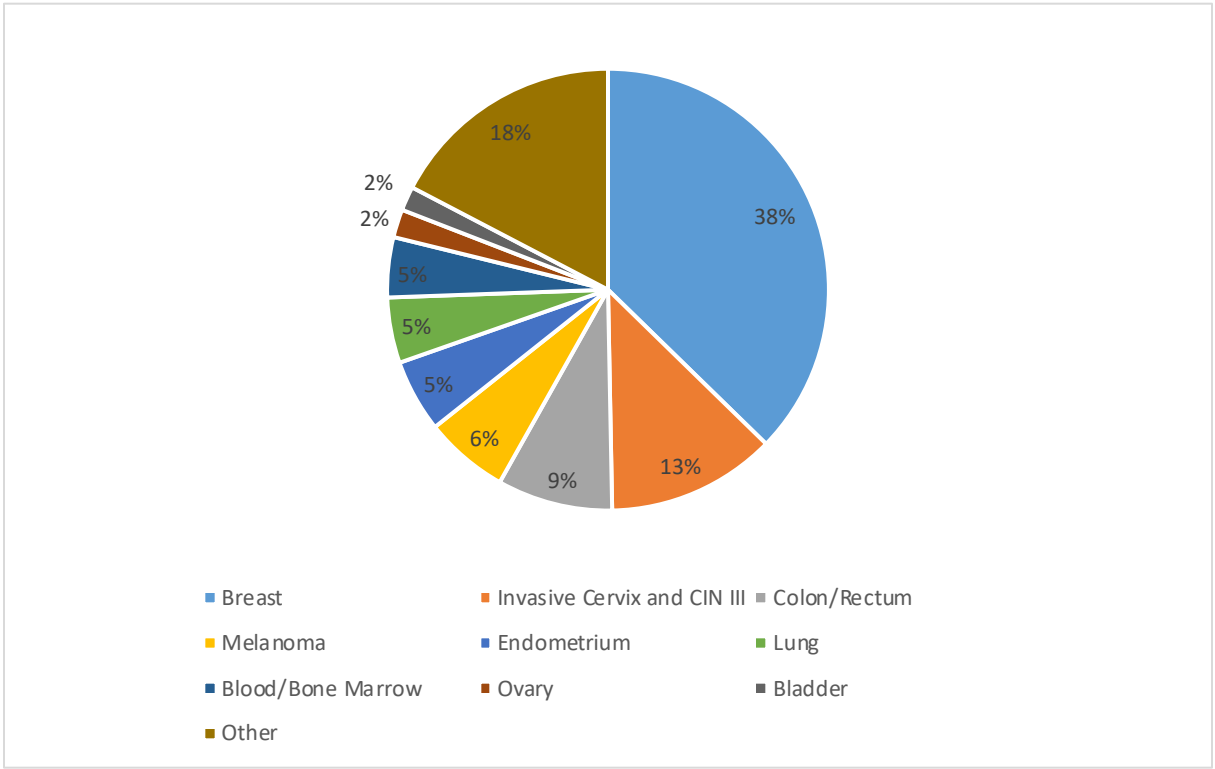


Figure 26: Ten most common cancers among females by site 2012-2021
(SOURCE: Bermuda National Tumour Registry, Bermuda Hospitals Board)
Note: Data excludes non-melanoma skin cancers



18 Bermuda Cancer and Health Centre. Bermuda National Cancer Control Plan 2024-2030. Bermuda, April 2023 (Forthcoming).

Figure 27: Ten most common cancers among males by site 2012-2021
(SOURCE: Bermuda National Tumour Registry, Bermuda Hospitals Board)
Note: Data excludes non-melanoma skin cancers

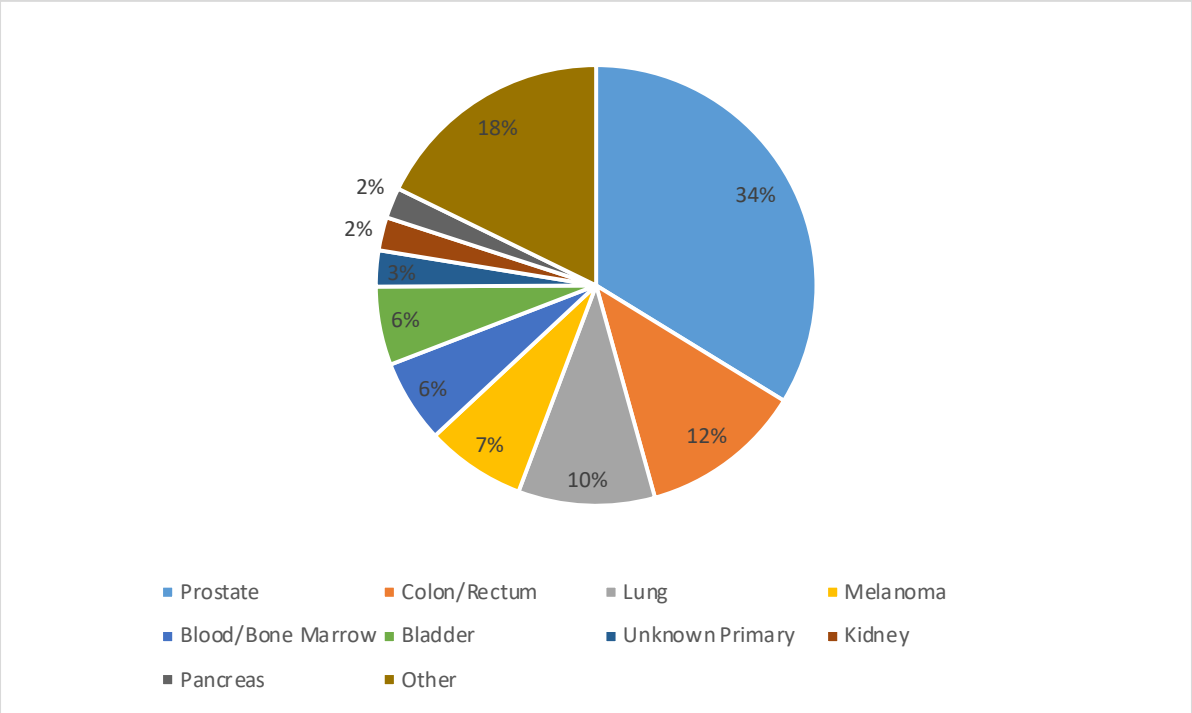
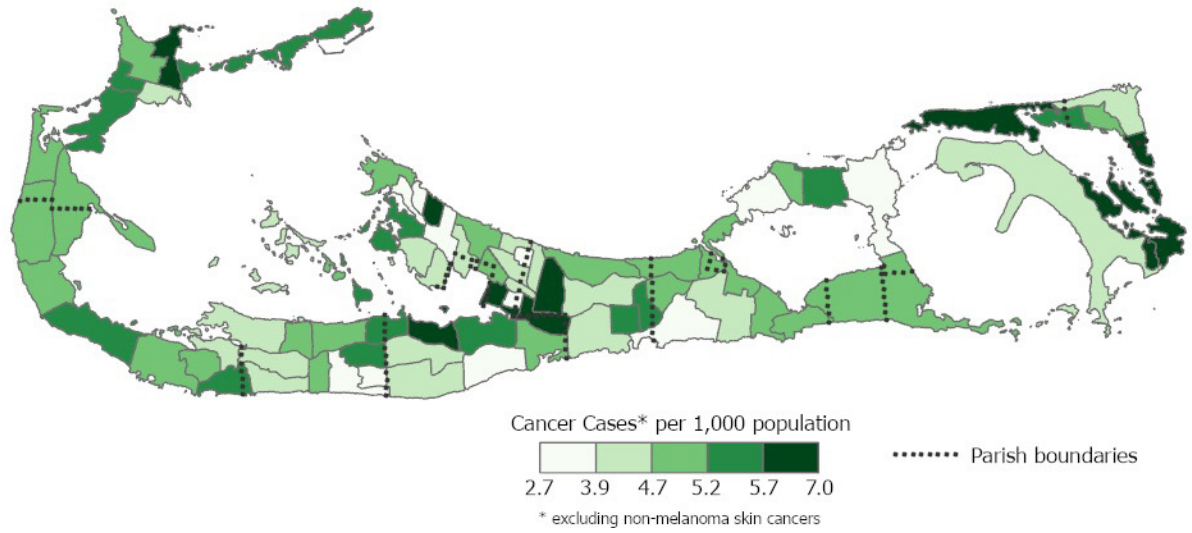
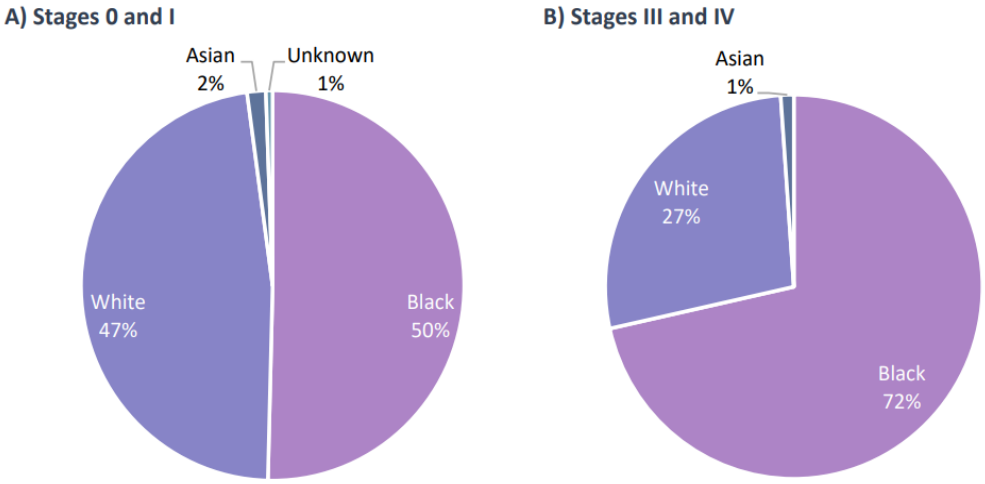


Figure 28: Cancer cases per 1,000 population 2012-2021 mapped by postcode[19]
(SOURCE: Bermuda National Tumour Registry, Bermuda Hospitals Board)
Note: Bottom panels' numbers refer to cancer cases per 1,000 population in each postcode
Data excludes non-melanoma skin cancers



19 The numerator data is taken from all cancers (excluding non-melanoma skin cancers) 2012-2021, whilst the denominator data is 10 x 2016 census data per census district. Whilst the denominator data does not reflect the exact underlying population per census district per year, the degree of variation is likely to be within an acceptable margin of error.

Figure 29: Cancer Cases 2017-2019 by Stage at Diagnosis and Race (excluding non-melanoma skin cancer)
SOURCE: Bermuda National Cancer Control Plan[20]



HEALTH RISK FACTORS

Tobacco

Table 26: Quantity of cigarettes consumed in the past month among those who currently smoke, 2021
(*SOURCE: Department for National Drug Control*[21])

Cigarettes consumed in the past month	Number of smokers	Percentage of smokers
1 to 5	297	5.6%
6 to 10	459	8.7%
11 to 20 (Half - 1 Pack)	804	15.3%
2 - 3 Packs	1185	22.5%
4 - 5 Packs	367	7.0%
More than 5 Packs	2082	39.6%

Table 27: Cigarette use by gender, 2021
***(SOURCE: Department for National Drug Control*[22])**

Cigarette use	Male	Female
Lifetime use of cigarettes	59.3%	45.7%
Used cigarettes in the past year	17.5%	6.9%
Current use of cigarettes	14.0%	5.7%

20 Bermuda Cancer and Health Centre. Bermuda National Cancer Control Plan. 2022. Available: https://www.cancer.bm/Uploaded%20Files/annual%20report/2021/bermuda%20nccp_national%20cancer%20assessment_2022%20(2).pdf

21 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

22 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

Table 28: Cigarette use by age, 2021
(SOURCE: Department for National Drug Control[23])

Age	Cigarette use by age
16-24	4.7%
25-34	10.9%
35-44	13.8%
45-54	12.5%
55-64	16.1%
65-74	5.3%
75-84	3.8%
85+	6.3%

Table 29: Estimates of global smoking prevalence by age range, 2020
(SOURCE: WHO[24])

Age	Global smoking prevalence
15-24	14.2%
25-34	21.7%
35-44	26.3%
45-54	28.5%
55-64	26.8%
65-74	22.7%
75-84	18.0%
85+	12.7%

Table 30: Current cigarette use by ethnic group, 2021
(SOURCE: Department for National Drug Control[25])

Ethnic group	Current smoker
Black or African	10.6%
White	7.4%
Portuguese	7.6%
Asian	12.9%
Mixed (Black & White, Black & Other, White & Other)	16.7%
Other	0.0%

23 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

24 World Health Organisation. WHO global report on trends in prevalence of tobacco use 2000-2025, fourth edition. Available: https://www.who.int/publications/i/item/9789240039322

25 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

Table 31: Current cigarette use by highest academic qualification, 2021 (SOURCE: Department for National Drug Control[26])

Highest Academic Qualification	Current smoker
None	9.9%
School Leaving Certificate/High School Diploma	13.1%
Technical/Vocational Certificate (Bermuda College)	7.9%
Associate's Degree	13.1%
Bachelor's Degree	7.7%
Master's Degree	3.9%
Doctorate Degree	13.7%
Professional Designation (With or Without Any Prior Academic Qualification)	6.9%
Other	25.7%

Table 32: Current cigarette use by employment status, 2021 (SOURCE: Department for National Drug Control[27])

Employment status	Current smoker
Employed/Self-Employed, working 1-39 hours per week	9.7%
Employed/Self-Employed, working 40 or more hours per week	12.3%
Not employed, looking for work	22.3%
Not employed, NOT looking for work (e.g. housewife, student, other)	3.6%
Retired	4.6%
Disabled, not able to work	22.3%
Not Stated	0.0%

Table 33: Smoking prevalence by country (SOURCE: Department for National Drug Control[28])

Country/Territory	Year	Age	Smoking prevalence
Bermuda	2021	16+	9.7%
England[29]	2021	18+	13.3%
USA	2019	18+	22.8%
Canada	2017	15+	15.1%
Barbados	2006	18+	9.1%
St Helena[30]	2021	18+	22.2%
Global[31]	*2020*	*15+*	*22.3%*

26 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

27 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

28 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf. .

29 UK Office for National Statistics. Adult smoking habits in the UK – Office for National Statistics. 2022. Available: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/bulletins/adultsmokinghabitsingreatbritain/2021

30 St Helena Government. St Helena Joint Strategic Needs Assessment. 2022. Available: https://www.sainthelena.gov.sh/wp-content/uploads/2022/10/Summary-of-St-Helenas-Joint-Strategic-Needs-Assessment-2022-JSNA.pdf

31 World Health Organization. Tobacco. 2022. Available: https://www.who.int/news-room/fact-sheets/detail/tobacco]

Alcohol

Table 34: Problematic drinking behaviour prevalence, 2021 (SOURCE: Department for National Drug Control[32])

Problematic drinking behaviour	Prevalence
When you wake up in the morning after having drunk the night before, have you ever experienced not remembering part of what happened?	14.0%
Have you felt like decreasing the amount of alcohol you drink?	13.5%
Have you lost friends or partners because of alcohol?	4.5%
Do you drink more than you want, without noticing?	3.8%
Have you had trouble with your partner because of alcohol?	3.5%
Does it bother you that you are criticised for the way you drink?	2.1%
Did you have to drink alcohol in the morning?	0.7%

Table 35: Alcohol use by gender, 2021[33]

Alcohol use	Male	Female
Lifetime use of alcohol	93.2%	89.1%
Used alcohol in the past year	74.0%	64.2%
Current use of alcohol	60.9%	47.7%

Table 36: Alcohol use by ethnic group, 2021 (SOURCE: Department for National Drug Control[34])

Ethnic group	Current drinker
Black or African	44.2%
White	69.0%
Portuguese	58.0%
Asian	41.0%
Mixed (Black & White, Black & Other, White & Other)	60.2%
Other	55.7%

Table 37: Alcohol use by highest academic qualification, 2021 (Department for National Drug Control[35])

Highest Academic Qualification	Current drinker
None	22.2%
School Leaving Certificate/High School Diploma	51.1%
Technical/Vocational Certificate (Bermuda College)	46.7%
Associate's Degree	59.4%

32 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

33 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

34 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf..

35 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

Bachelor's Degree	65.0%
Master's Degree	60.1%
Doctorate Degree	62.7%
Professional Designation (With or Without Any Prior Academic Qualification)	76.9%
Other	16.7%

Table 38: Alcohol use by employment status, 2021
(Department for National Drug Control[36])

Employment status	Current drinker
Employed/Self-Employed, working 1-39 hours per week	53.1%
Employed/Self-Employed, working 40 or more hours per week	65.1%
Not employed, looking for work	54.0%
Not employed, NOT looking for work (e.g. housewife, student, other)	48.3%
Retired	39.4%
Disabled, not able to work	28.1%

Table 39: Alcohol use by country, 2021
(SOURCE: Department for National Drug Control[37])

Country/Territory	Age	Alcohol consumption prevalence
Bermuda	16+	54.0%
USA	18+	54.9%
Canada	15+	78.2%
Barbados	18+	36.2%

Excess Weight

Table 40: Percentage of 5-year-olds that are overweight
(SOURCE: Department of Health[38])

School year	14-15	15-16	16-17	17-18	18-19	19-20	20-21
Total Population	716	703	599	716	563	516	259
Percentage of students screened	97% (697)	99% (697)	99% (593)	84% (600)	98% (553)	87% (451)	99% (257)
Percentage of screened who are overweight BMI >25	22% (156)	22% (154)	25% (149)	32% (191)	31% (174)	28% (127)	33% (86)

36 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

37 Department for National Drug Control, Government of Bermuda. 2021 National Household Survey. Available: https://www.gov.bm/sites/default/files/National_Household_Survey_2021_Report_FINAL.pdf.

38 Department of Health, Government of Bermuda. Child Health Obesity Data. Unpublished. Please note: the 2020/21 data did not include all schools and therefore may not be representative.

Table 41: BMI by gender, 2023[39]

BMI	Male	Female
BMI ≥ 25 (overweight including obesity)	71.3%	71.7%
BMI 25-30 (overweight)	37.4%	36.1%
BMI ≥ 30 (obese)	33.9%	35.6%

Table 42: BMI by age range, 2023[40]

Age range	BMI ≥ 25 (overweight including obesity)	BMI 25-30 (overweight)	BMI ≥ 30 (obese)
18-34	73.3%	44.4%	28.9%
35-64	75.2%	36.8%	38.4%
65+	61.8%	33.7%	28.1%

Table 43: BMI by ethnic group, 2023[41]

Ethnic group	BMI ≥ 25 (overweight including obesity)	BMI 25-30 (overweight)	BMI ≥ 30 (obese)
Black	75.0%	38.2%	36.8%
White	62.2%	31.9%	30.3%
Mixed and Other	80.4%	41.3%	39.1%

Table 44: BMI by income, 2023[42]

Income group	BMI ≥ 25 (overweight including obesity)	BMI 25-30 (overweight)	BMI ≥ 30 (obese)
< $75,000	70.5%	35.6%	34.9%
$75,000-$150,000	72.8%	33.17%	39.7%
> $150,000	76.1%	41.3%	34.8%

Table 45: Percentage of adults that are overweight and obese by comparator areas (SOURCES: See table's footnotes)

Country/Territory	Year	Overweight	Obese
Bermuda	2023	37%	35%
England[43]	2021	38%	26%
USA[44]	2018	31%	42%
Global[45]	2016	39%	13%

39 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

40 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

41 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

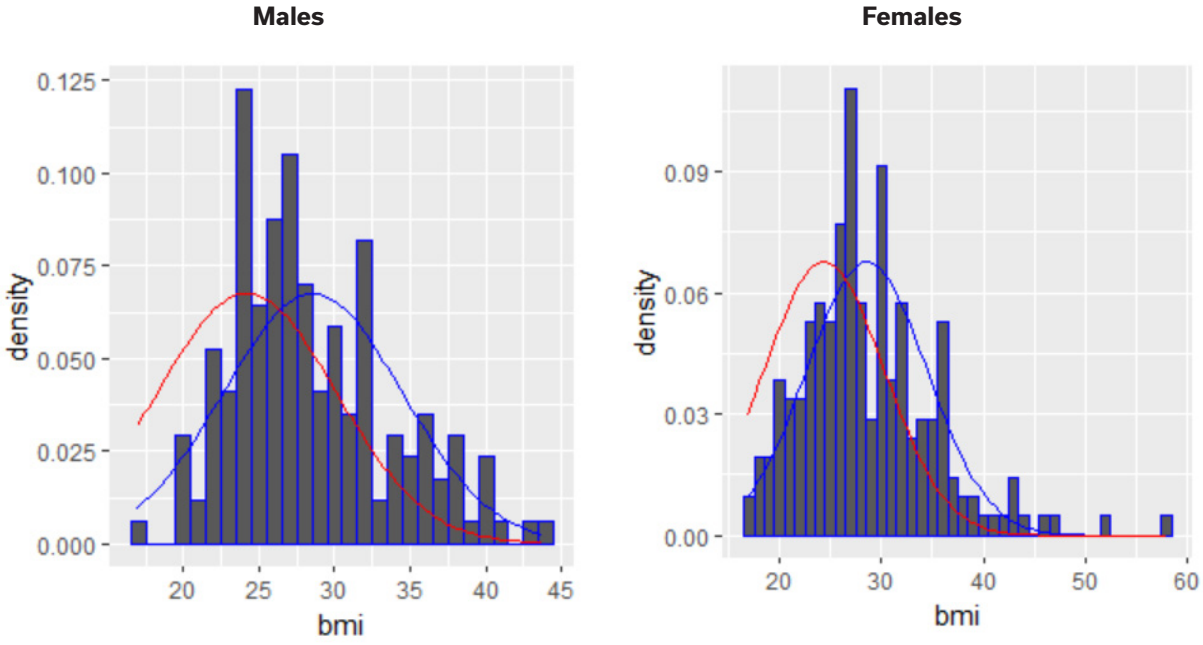
42 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

43 Baker C. Obesity statistics. Available: https://researchbriefings.files.parliament.uk/documents/SN03336/SN03336.pdf

44 US Department of Health and Human Services. Overweight & Obesity Statistics. Available: https://www.niddk.nih.gov/health-information/health-statistics/overweight-obesity#:~:text=the%20above%20table-,Nearly%201%20in%203%20adults%20(30.7%25)%20are%20overweight.,obesity%20(including%20severe%20obesity).

45 World Health Organization. Obesity and overweight. Available: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight

Figure 30: Histogram of BMI Distribution in Bermuda's Population[46]



Nutrition: fruit and vegetable intake

Table 46: Fruit and vegetable intake by gender, 2023[47]

Fruit and vegetable intake	Male	Female
5+ fruit and vegetables daily	24.8%	33.8%

Table 47: Fruit and vegetable intake by age range, 2023[48]

Age range	5+ fruit and vegetables daily
18-34	33.3%
35-64	31.0%
65+	25.3%

Table 48: Fruit and vegetable intake by ethnic group, 2023[49]

Ethnic group	5+ fruit and vegetables daily
Black	30.2%
White	34.1%
Mixed and Other	20.0%

46 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

47 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

48 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

49 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

Table 49: Fruit and vegetable intake by income, 2023[50]

Income group	5+ fruits and vegetables daily
< $75,000	26.1%
$75,000-$100,000	31.2%
> $150,000	33.7%

Physical activity

Table 50: Physical activity by age range, 2023[51]

Age range	Meet WHO guidelines for physical activity	Insufficient physical activity
18-34	87.2%	12.8%
35-64	78.6%	21.4%
65+	75.0%	25.0%

Table 51: Physical activity by ethnic group, 2023[52]

Ethnic group	Meet WHO guidelines for physical activity	Insufficient physical activity
Black	71.5%	28.5%
White	87.3%	12.7%
Mixed and Other	91.3%	8.7%

Table 52: Physical activity by income, 2023[53]

Income group	Meet WHO guidelines for physical activity	Insufficient physical activity
< $75,000	72.2%	27.8%
$75,000-$150,000	83.3%	16.7%
> $100,000	84.4%	15.6%

Table 53: Insufficient physical activity by comparison area (SOURCE: WHO[54]**)**

Country/Territory	Insufficient physical activity
Bermuda	21.2%
Barbados	42.9%
Canada	28.6%
UK	35.9%
USA	40.0%
High-income countries	36.8%
Global	27.5%

50 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

51 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

52 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

53 Department of Health, Government of Bermuda. Bermuda Omnibus Pulse Survey January 2023. Unpublished. Narrative Research Bermuda.

54 World Health Organisation. Global Health Observatory. Available: https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-insufficient-physical-activity-among-adults-aged-18-years-(age-standardized-estimate)-(-)

Air Pollution

Table 54: Annual air emissions from Tynes Bay waste to energy incinerator, 2020 (SOURCE: Department of Statistics[55])

Component of Air Pollution	Year			
	2016	2017	2018	2019
NO2 (mg/Nm3)	274.4	242.9	322.7	353.3
SO2 (mg/Nm3)	36.5	43.8	1.7	69.4
Particulate Matter (mg/Nm3)	3.9	8.1	2.8	39.6

Table 55: European Directive limits on air pollution[56]

Component of Air Pollution	Limit
PM10	40 µg/m3 (annual mean); 50 µg/m3 (24 hour mean) not to be exceeded more than 35 times a year.
PM2.5	20 µg/m3 (annual mean)
NO2	40 µg/m3 (annual mean); 200 µg/m3 (1 hour mean) not to be exceeded more than 18 times a year
SO2	125 µg/m3 (24 hour mean) not to be exceeded more than 3 times a year; 350 µg/m3 (1 hour mean) not to be exceeded more than 24 times a year

HEALTH PERSONNEL

Table 56: Bermuda Health Workforces (SOURCE: 2021 Labour Force Survey)

Occupation	Number	Bermudian	Non-Bermudian	% Non-Bermudian
Dentist	34	21	13	38.24%
Medical Laboratory Technician	38	20	18	47.37%
Medical Worker NEC	103	85	18	17.48%
Occupational Therapist	31	16	15	48.39%
Pharmacist	81	23	58	71.60%
Physician	160	70	90	56.25%
Physiotherapist	47	26	21	44.68%
Radiological Technician	44	24	20	45.45%
Registered Nurse	373	95	278	74.53%
Surgeon	10	4	6	60.00%
Total Human Health Workers	2046	1425	621	30.35%

55 Department of Statistics, Government of Bermuda. Environmental Statistics Compendium 2021. Available: https://www.gov.bm/sites/default/files/2021-Environmental-Statistics-Compendium.PDF] Please note: The data is captured through isokinetic sampling over a two day period each year and is reported normalised to 11% oxygen.

56 UK Department for Environment Food and Rural Affairs. UK AIR. National air quality objectives and European Directive limit and target values for the protection of human health. Not dated. Available: https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf [accessed 14th March 2023].

HEALTH SERVICES

Insurance Coverage

Table 57: Population by type of health insurance coverage, 2010 and 2016
(SOURCE: 2016 Census and Housing Report)

Type of Health Insurance Coverage	Number		Percentage		Percentage Change 2010-2016
	2016	2010	2016	2010	
Total	63,779	64,237^	100	100	
Major Health Coverage (Private or GEHI)	46,084	50,759	72	84	-12
None	5,341	3,233	8	5	+3
Only Private Basic Coverage	4,015	1,349	6	2	+4
Only HIP	3,632	3,053	6	5	+1
Only FutureCare	3,244	1,965	5	3	+2
Insured – Type Unknown	1,389	*	2	*	*
Not Stated	74	1,327			

Notes: * represents <1%, ^includes 2,551 persons for whom there is no data

Figure 31: Percentage of population without health insurance coverage by census district
(SOURCE: 2016 Census and Housing Report)

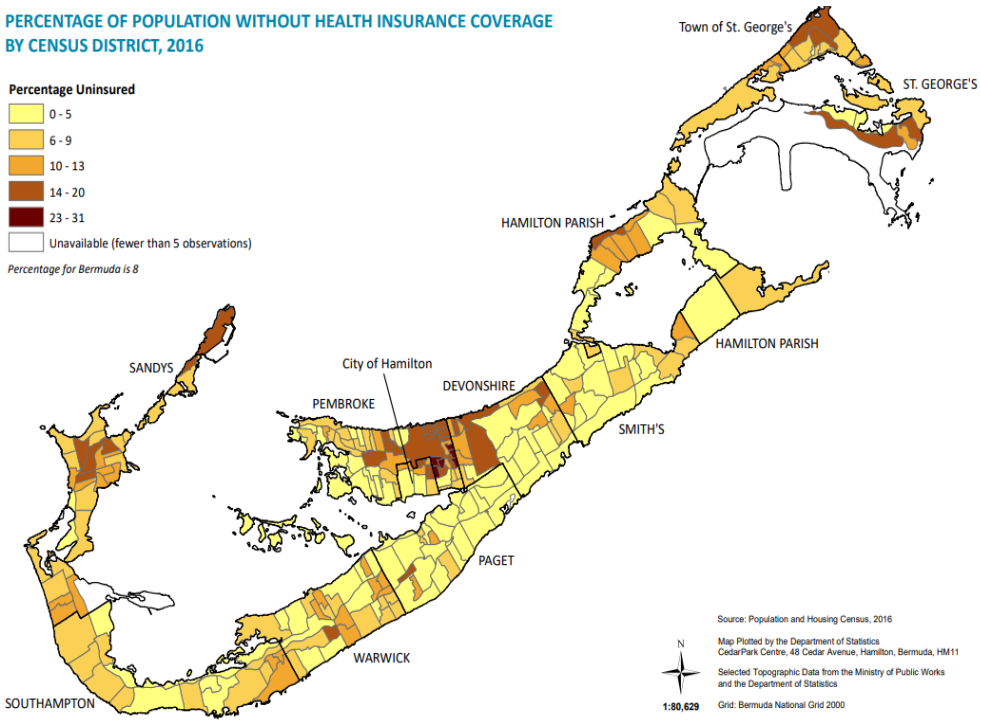


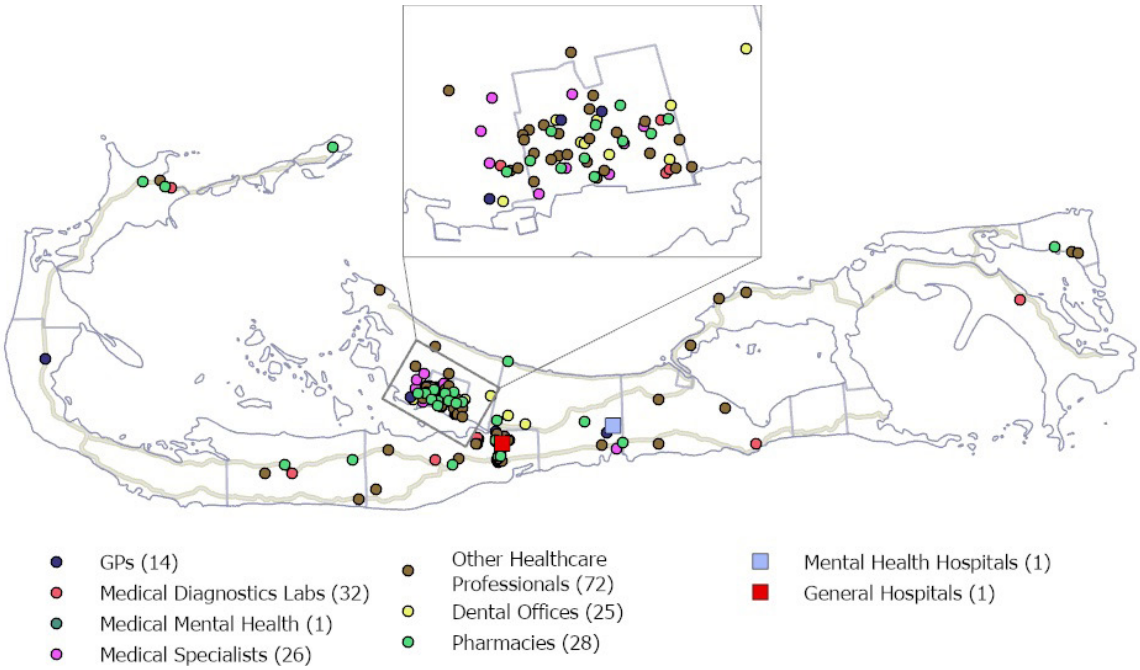
Table 58: Demographic Characteristics of Uninsured Population, 2010 and 2016 (SOURCE: 2016 Census and Housing Report)

Demographic Characteristics	Number		Percentage in 2016	Percentage Change 2010-2016
	2010	2016		
Sex	**3,233^**	**5,341**	**100**	
Male	1,911	3,000	56	+3
Female	1,322	2,341	44	-3
Age Groups (years)	**3,233**	**5,341**	**100**	
0 – 14	602	1,008	19	*
15- 29	897	1,286	24	-4
30-44	637	942	18	-2
45-64	210	564	11	+5
Median Age (years)	32	35		
Race	**3,233**	**5,341**	**100**	
Black	2,480	4,085	77	*
White	288	499	9	*
Mixed and Other	444	754	14	*
Not Stated	21	3		
Nativity	**3,233**	**5,341**	**100**	
Bermuda Born	2,786	4,601	86	*
Foreign Born	438	737	14	*
Not Stated	9	3		
Bermudian Status	**3,233**	**5,341**	**100**	
Bermudian Status	2,974	4,949	93	+1
Non-Bermudian	251	392	7	-1
Not Stated	8			
Highest Academic Qualification (16 years +)	**2,596**	**4,254**	**100**	
No Formal Certificate	1,001	880	21	-18
High School Certificate	970	2,063	49	+11
Tech./Voc./Assoc./Diploma	338	845	20	+7
Degree	219	460	11	+2
Other	27	0	*	-1
Not Stated	41	6		
Economic Activity (16 years +)	**2,596**	**4,254**	**100**	
Working	1,139	1,550	36	-8
Unemployed	755	1,354	32	+3
Economically Inactive	679	1,344	32	+6
Not Stated	23	6		

Notes: ^ excludes persons for whom there is no data

Health Facilities

Figure 32: Map of Bermuda Health Facilities
(SOURCE: Bermuda Health Council Health Facility Data, December 2022)



Reasons for Hospitalisation

Figure 33: Reasons for Hospitalisation: Combined Total by ICD Code (2012-2021)
(SOURCE: BHB/ESU)

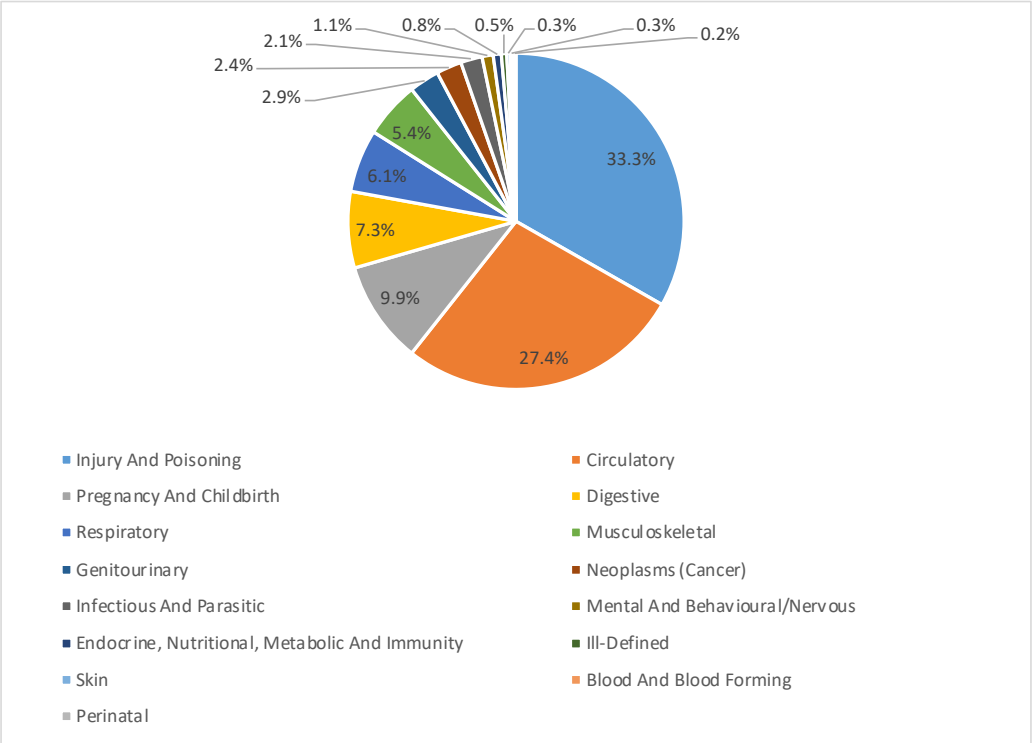


Table 59: Reasons for Hospitalisation by ICD Code (2012-2021)
(SOURCE: BHB/ESU)

ICD Group	2012	2013	2014	2015	2016	2017	2018	2019	2020[57]	2021
Injury And Poisoning	21.8%	21.3%	21.2%	20.0%	19.8%	20.1%	19.8%	19.7%	15.2%	11.1%
Circulatory	12.5%	13.7%	13.6%	14.1%	14.4%	15.7%	15.8%	17.1%	17.8%	16.5%
Pregnancy And Childbirth	12.6%	12.3%	11.1%	11.2%	10.9%	10.6%	9.9%	9.6%	12.3%	11.7%
Digestive	9.6%	9.6%	10.1%	9.5%	11.9%	10.8%	10.5%	10.4%	11.5%	12.7%
Respiratory	10.2%	8.9%	9.5%	9.7%	8.8%	8.5%	8.7%	8.8%	7.6%	10.4%
Musculoskeletal	6.3%	6.3%	6.7%	6.9%	6.8%	5.2%	5.4%	4.9%	4.2%	3.7%
Genitourinary	5.1%	4.7%	4.6%	6.2%	5.2%	5.5%	6.7%	5.4%	5.6%	5.9%
Neoplasms (Cancer)	5.9%	5.5%	6.3%	5.6%	5.4%	4.9%	4.9%	5.2%	5.1%	5.2%
Infectious And Parasitic	2.5%	2.6%	3.0%	4.0%	4.6%	4.8%	4.4%	5.8%	5.9%	4.9%
Mental & Behavioural/ Nervous	3.7%	3.9%	3.2%	2.8%	3.3%	4.0%	4.1%	4.1%	4.9%	7.3%
Endocrine, Nutritional, Metabolic And Immunity	3.2%	3.5%	3.5%	3.2%	2.8%	3.8%	3.7%	3.2%	3.3%	3.7%
Ill-Defined	2.5%	3.4%	3.1%	2.7%	1.9%	2.1%	2.3%	2.5%	2.3%	3.1%
Skin	1.6%	1.9%	1.9%	1.7%	1.8%	2.0%	1.9%	1.7%	1.9%	2.2%
Blood And Blood Forming	1.8%	1.7%	1.7%	1.9%	2.0%	1.6%	1.6%	1.4%	1.7%	1.6%
Perinatal	0.5%	0.5%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%	0.4%	0.1%
Congenital	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

57 NB: Changed from ICD 9 to ICD 10 in 2020.

Health Spending

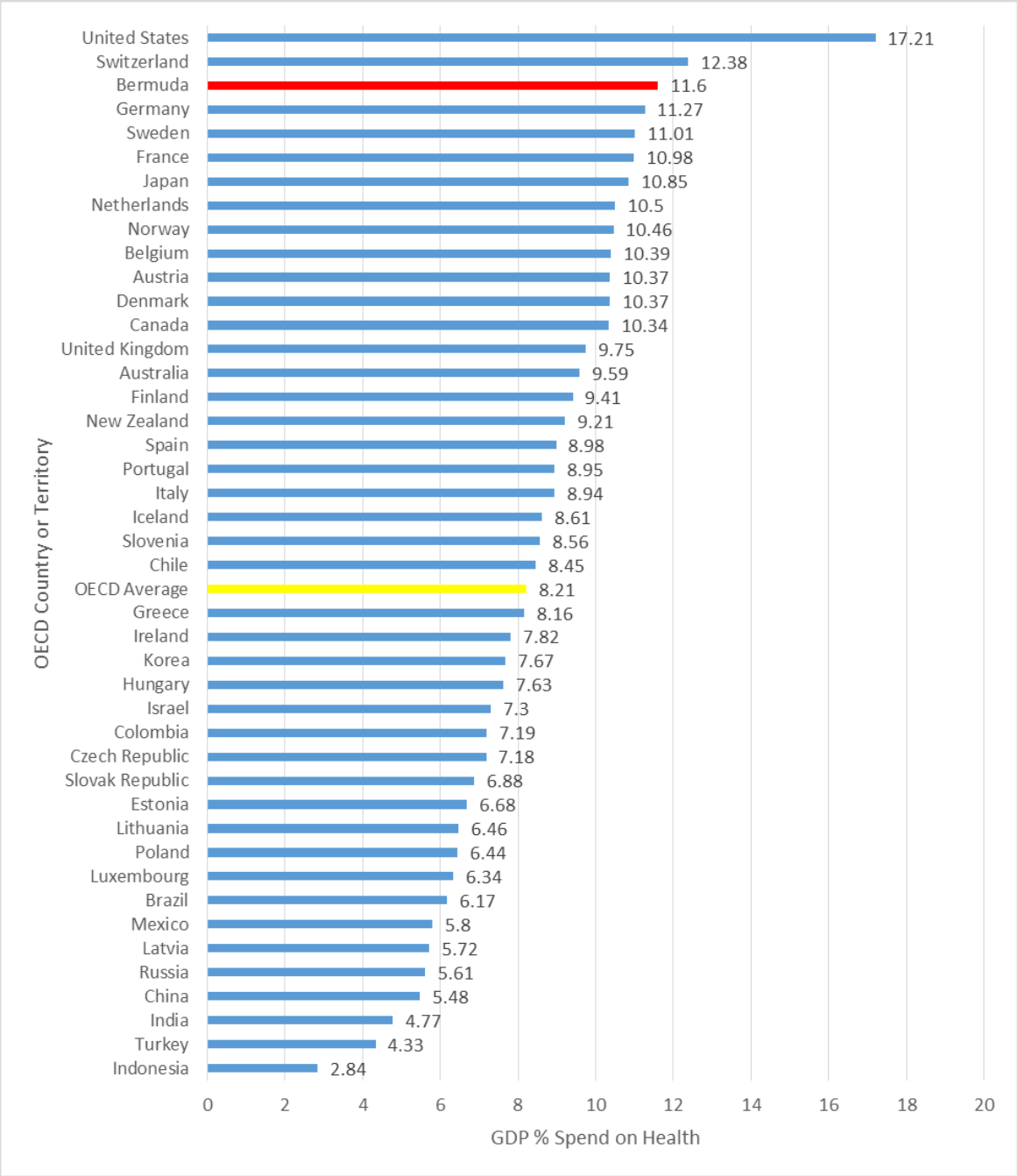
Table 60: Sources of Health Finance FY17-18
(SOURCE: 2019 Health Account Report)

Source Health Finance	Amount ($000s)	% of Total
Ministry of Health	$161,080	21.9%
Department of Social Insurance	$3,235	0.4%
Grants for provision of health services	$2,363	0.3%
Public Sector Sub-Total	**$166,678**	**22.6%**
Health Insurance	$453,260	61.5%
Out-of-Pocket Expenditure	$109,992	14.9%
Donations	$6,696	0.9%
Private Sector Sub-Total	**$569,947**	**77.4%**
Total Public & Private	**$736,625**	**100.0%**

Table 61: Health Expenditure FY 17-18
(SOURCE: 2019 Health Account Report)

Health Expenditure	Amount ($000s)	% of Total
Ministry of Health HQ	$11,479	1.6%
Department of Health	$25,689	3.5%
Bermuda Hospitals Board	$307,514	41.7%
Public Sector Sub-Total	**$344,681**	**46.8%**
Local Practitioners – Physicians	$57,656	7.8%
Local Practitioners – Dentists	$31,820	4.3%
Other Health Providers, Services & Appliances	$92,385	12.5%
Prescription drugs	$44,597	6.1%
Overseas care	$93,114	12.6%
Administration of health insurance, health policy and health programmes	$72,374	9.8%
Private Sector Sub-Total	**$391,945**	**53.2%**
Total Public & Private	**$736,625**	**100.0%**

Figure 34: International comparison of health expenditure as share of GDP (SOURCE: 2019 Health Accounts Report)



COVID-19 and healthcare accessibility and availability

Figure 35: Effect of pandemic on accessibility and availability of healthcare (SOURCE: Bermuda Vital Signs® Special COVID-19 Pandemic Edition in October 2022)

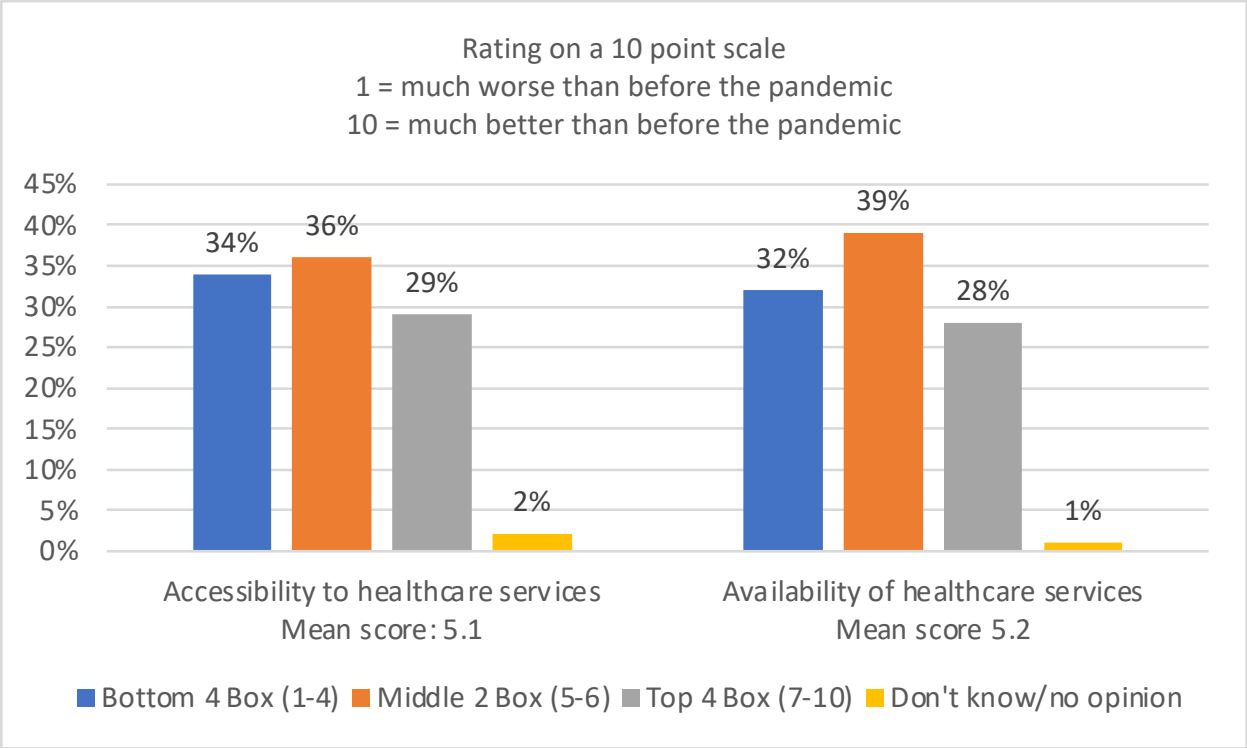


Figure 36: Accessibility and availability of healthcare within the next year (SOURCE: Bermuda Vital Signs® Special COVID-19 Pandemic Edition in October 2022)