HEALTH IN REVIEW

An International Comparative Analysis of Bermuda Health System Indicators

GOVERNMENT OF BERMUDA
Ministry of Health
Department of Health

Bermuda Health Council
BHeC

Health in Review

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Executive Summary

"Health in Review: An International Comparative Analysis of Bermuda Health System Indicators" is the first report of its kind prepared jointly by the Bermuda Health Council and the Department of Health. In the charts and commentary presented, this report provides a detailed snapshot of health and healthcare in Bermuda. The report also compares Bermuda's performance to other high-income countries and documents the Island's healthcare trends. The trends highlighted in the report include: health status, social determinants of health, the health workforce, healthcare activities, quality, access, and health expenditure and financing. Additional information is also provided on the demographic and economic context within which the health system operates.

The findings of the "Health in Review" report will assist the Department of Health and the Bermuda Health Council to monitor and improve the health of Bermuda's residents. The publication will also be an asset to healthcare partners and stakeholders in providing benchmarks and comparisons for Bermuda never seen before on this scale. Some key highlights are described below.

Health Status

Life expectancy at birth and at age 65 have increased steadily, while there have been declines in premature mortality as well as general mortality rates. No clear trends were observed in mortality from communicable diseases, diabetes or external causes. Suicide rates remained low; however, there have been recent spikes in homicide rates. Overall cancer mortality decreased, with marked reduction in lung and breast cancer mortality but there was no clear trend in mortality from prostate cancer. Ischemic heart disease mortality rates declined, but there was no significant change in mortality from stroke.

In comparison to the Organisation for Economic Cooperation and Development (OECD) average, Bermuda's mortality rates were higher for ischemic heart disease, lung cancer, prostate cancer (highest overall), and road accidents (also highest overall). On the other hand, Bermuda's rates were on par with the OECD average for stroke mortality and lower than the OECD average for breast cancer mortality and suicide.

There have been increases in low birth weight, infant mortality, and under-five mortality, but maternal deaths remain rare.

Bermuda's residents have a better perception of their health status than that reported in the majority of the OECD countries. The oral health of Bermuda's children compares very favourably against the OECD, with Bermuda being among the few countries where children have, on average, less than one decayed, missing, or filled permanent tooth.

Bermuda has a rate of diabetes that is higher than all OECD countries. Likewise for AIDS; although, the AIDS incidence is related to past HIV infection and the expanded case definition used in Bermuda compared to the other OECD countries. Bermuda continues to have sporadic, imported cases of malaria, tuberculosis, and dengue.

Social Determinants of Health

Alcohol and marijuana use has increased among Bermuda's youth while cigarette smoking has declined. Bermuda rates of these behaviours are lower than the rates in the United States. Bermuda's youth reported a small increase in the consumption of fruits and vegetables and participation in physical activity between 2001 and 2006. Bermuda's rate of overweight and obese adolescents, however, is considerably higher than the OECD average.

Self-reported use of tobacco and alcohol consumption has decreased and Bermuda has a lower proportion of daily smokers than any OECD country.

The rate of overweight and obesity among adults has increased and is among the highest rates when compared to OECD countries.

Health Workforce

Bermuda has a lower density of health workers than the OECD average for all sectors, but most notably for physicians, nurses, dentists and pharmacists.

Healthcare Activities

Bermuda's residents exhibit high health-seeking behaviour with over 90% of residents reporting at least one visit to a doctor in a one-year period. In addition, demand for medical technologies is high with greater use of MRI and CT exams than the OECD average. Both the hospital occupancy rate and the average length of stay in hospital have been relatively stable and generally below the OECD

average. In addition, the hospital discharge rate has declined and is also generally below the OECD average.

Treatment for end-stage renal failure (ESRF), caesarean section rates and the number of cataract surgeries performed each year have increased. Factors other than direct medical need may have influenced the rise in all of these treatments except for ESRF.

Quality of Care

Avoidable hospital admissions for asthma have declined but remain higher than the OECD average. The admission rate for chronic obstructive pulmonary disease (COPD) has also declined and remained much lower than the OECD average. There was no clear trend in admission rates for diabetes complications, but this rate was among the highest of the OECD countries.

Heart diseases showed conflicting trends with declines in admissions for congestive heart failure (CHF) and no clear trend for hypertension. Although CHF rates fell in Bermuda, they remained higher than the OECD average while Bermuda's hypertension rates were much lower than the OECD rates. In-hospital mortality from heart diseases also declined.

There has been no clear trend in unplanned hospital re-admissions for mental disorders, but Bermuda's rates are consistently higher than the OECD average.

Mortality rates from cervical and colorectal cancer have fluctuated over the years; however, the low rate of colorectal cancer mortality indicates that there is effective screening in the population. Screening rates are also very high for cervical cancer and breast cancer.

Bermuda's vaccination programme for children and seniors appears successful with generally high rates of vaccine uptake.

Access to Care

Bermuda's residents generally feel their healthcare needs are being met; however, the cost of insurance coverage, availability, and access to specialist care present barriers to some. Out-of-pocket health expenditure is similar to the OECD average. Access to doctors, in particular specialists, dentists, and cancer screening for breast and cervical cancer was correlated with income.

Health Expenditure and Financing

Bermuda's total health expenditure per capita in 2007 was 40% higher than the OECD average, and was the second highest among the OECD countries. Total health expenditure represented 8.5% of GDP, which is comparable to the OECD average. The Bermuda Hospitals Board accounted for 40% of total health expenditure in 2008, while overseas care accounted for 16%. The Government contributed 29% of healthcare financing in 2007; the OECD average for government contributions was 70%.

Demographics and Socioeconomics

Changes in the population distribution, crude birth rate, dependency ratio and annual population growth rate all indicate the shift to an ageing population, which impacts the distribution of healthcare resources. Additionally, the total fertility rate remains below replacement level, which also has implications for population growth and sustainability.

One overarching finding of this report is the weak relationship in Bermuda, between GDP per capita and health expenditure per capita, and between health expenditure and life expectancy. By contrast, the majority of OECD countries have a life expectancy that is closely correlated with GDP per capita and health expenditure per capita. This indicates that there may be efficiency opportunities in the allocation of healthcare resources in Bermuda's health system.

Introduction

The Bermuda Health Council and the Department of Health are pleased to present "Health in Review: An International Comparative Analysis of Bermuda Health System Indicators". In Bermuda's context this report is the first of its kind. It provides an extensive overview of Bermuda's health trends and compares them to other high-income countries. It is hoped that this publication will highlight areas of strength in our health system and bring to light areas where improvements may be sought.

The ultimate purpose of this report is to provide an analysis of the available evidence to further enable healthcare stakeholders and policy makers to develop a common agenda to improve the health of Bermuda.

Monitoring the health of Bermuda's residents is essential in the development of sound health policy, research, and programme priorities. There is sufficient data available in Bermuda to provide an overview of the country's health status. However, most of the data is generated by various independent agencies and is rarely combined into a single document.

To improve the health of all residents it is critical to collect and collate this data on all components of health, to document trends in risk factors, health status, access to and utilisation of healthcare services, and to disseminate reliable and accurate information about the health of the population. Having consolidated healthcare information will assist health stakeholders in making evidence-based policy decisions, founded on reliable and valid information about the quality of healthcare provision and population outcomes and inequalities.

Bermuda's "Health in Review" report is based on a model developed by the Organisation for Economic Cooperation and Development (OECD). The OECD was established in 1961 and is comprised of 30 countries (see Annex A) who together aim to tackle the economic, environmental and social issues of globalisation. It offers a setting where governments can compare their experiences with policies, search for answers to shared problems, establish good practice, and organise domestic and international policies.[1]

One of the goals of the OECD has been to identify a conceptual framework for healthcare quality indicators. After analysing several well-known frameworks from countries such as Australia, Canada, and the USA, a framework was designed in 2006 based on four levels:

(i) **health** – to obtain a snapshot of a society's broad measures of health that might be influenced through healthcare and non-healthcare elements;

(ii) **non-healthcare determinants of health** – to identify social and non-healthcare elements that also affect the health of the majority of the population;

(iii) **healthcare system performance** – to identify a healthcare system's processes, inputs, outcomes, efficiency and equity, and to understand that at times these might influence non-healthcare factors; and

(iv) **health system design and context** – to provide relevant country and health system policy and delivery attributes that affect costs, expenditure, and utilisation trends and which are crucial for understanding the healthcare performance level.[2]

In 2009 the OECD further developed the framework (see Annex B) and specified numerous healthcare quality indicators that fall under the various framework levels in their publication Health at a Glance 2009: OECD Indicators.[3] The Pan American Health Organization (PAHO) has also developed a list of Basic Indicators on which to compare country healthcare systems.

This report uses primarily the OECD model, but includes selective PAHO indicators. Data for each indicator is presented in the form of charts showing Bermuda's trends overtime, as well as comparisons with OECD member countries when possible. The charts are supplemented with a brief description of trends and observations. It is clearly indicated in the text whether the indicator is a PAHO or OECD indicator. For certain indicators Bermuda had data that was similar but not comparable to the PAHO or OECD indicators. These indicators are labelled as Bermuda-specific indicators. All PAHO and OECD indicator definitions are taken from the appropriate source documents as indicated in the text.

At present, Bermuda does not collect data for all the indicators identified in OECD's "Health at a Glance" and therefore some indicators have been omitted. A number of indicators were omitted because they are not applicable to Bermuda, e.g. "Foreign-trained physicians" – Bermuda does not have a medical school and therefore all physicians are foreign trained. There are also instances in which there are limitations on data comparability due to varying methodologies (e.g. differing definitions). Such instances are identified in the text and are also explained in the reference document as necessary.

There are a total of 71 quality and performance health indicators used in this report which are grouped and presented as follows:

1. *Health Status* – 21 indicators

2. *Social Determinants of Health* – 6 indicators

3. *Health Workforce* – 6 indicators

4. *Healthcare Activities* – 8 indicators

5. *Quality of Care* – 11 indicators

6. *Access to Care* – 5 indicators

7. *Health Expenditure and Financing* – 6 indicators

8. *Demographics and Socioeconomics* – 8 indicators

This inaugural report will be updated periodically, adding more indicators as the infrastructure is set-up to collect and analyse data on more elements of the quality of healthcare in Bermuda. It is hoped that this publication will be a useful addition to the landscape of our growing health system, and that it will be of value to our public health partners, healthcare stakeholders, and to the public we serve.

List of acronyms

AIDS	Acquired Immunodeficiency Syndrome
ALOS	Average Length of Stay
AMI	Acute Myocardial Infarction
BMI	Body Mass Index
DMFT	Decayed, Missing or Filled permanent Teeth
CAT or (CT)	Computed Axial Tomography
CHF	Congestive Heart Failure
COPD	Chronic Obstructive Pulmonary Disease
GDP	Gross Domestic Product
ESRF	End Stage Renal Failure
GP	General Practitioner
HBSC	Health Behaviour in School-aged Children survey
HIV	Human Immunodeficiency Virus
IHD	Ischemic Heart Disease
MRI	Medical Resonance Imaging
OECD	Organisation for Economic Co-operation and Development
PAHO	Pan American Health Organization
PPP	Purchasing Power Parity
PYLL	Potential Years of Life Lost
WHO	World Health Organisation

1. HEALTH STATUS

1.1 Life expectancy at birth

Life expectancy at birth is a basic indicator for population health. It reflects the cumulative effect of risk factors, occurrence and severity of disease, and the effectiveness of interventions and treatment. It is, in effect, a summary of the mortality patterns prevailing across age groups – infant and child, adolescent, adult and elderly.[4] Low life expectancy is related to high mortality in younger age groups. High life expectancy and its continued increase are associated with reductions in mortality rates at all ages. These reductions are attributable to a number of factors including improved living standards and greater access to quality health services.

Life expectancy at birth in Bermuda has been steadily increasing since 2000, reaching 79.3 in 2010 (Figure 1.1.2). This increase has occurred regardless of gender; however, the life expectancy for females remains greater than for males (Figure 1.1.2). Life expectancy - overall and by gender - is on par with the OECD average with the gender gap of 5.4 years being slightly narrower than the OECD average of 5.6 years (Figures 1.1.3 and 1.1.4).

Bermuda, like the United States, has a lower life expectancy than would be expected based on the national wealth (as measured by GDP per capita) alone (Figure 1.1.5). And when the Island is compared to other countries, Bermuda's life expectancy is lower than expected in relation to health spending per capita (Figure 1.1.6). Although many factors, other than GDP per capita and health expenditure (which is influenced by GDP), influence life expectancy, this finding indicates that health spending could be more cost-effective and achieve the same or similar gains in life expectancy. Equally, the same level of spending could be better channelled to achieve greater gains in life expectancy.

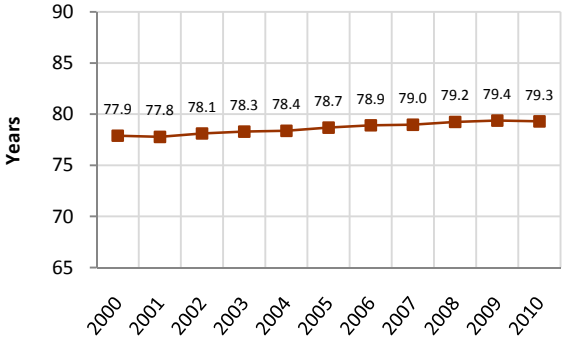
For historical and geographic reasons there is often an interest in the Caribbean region. Data is not available for the full range of indicators but, for example, in 2007 life expectancy in Barbados was 77, in Bahamas 74, in Jamaica 73, and in Antigua 72.[5] Per capita health expenditure in these countries ranged from USD$215 to USD$1,100, compared to Bermuda's USD $7,885 in 2007).

Definition and deviations

Life expectancy measures how long on average people would live based on a given set of age-specific death rates. However, the actual age-specific death rates of any particular birth cohort cannot be known in advance. If age-specific death rates are falling (as has been the case over the past decades in OECD countries), actual life spans will be higher than life expectancy calculated with current death rates (OECD, 2009, p16).

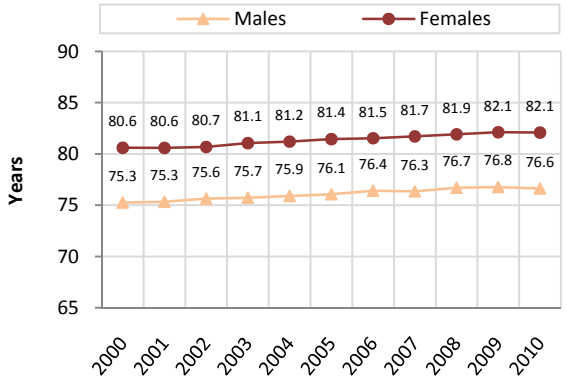
Each country calculates its life expectancy according to methodologies that can vary somewhat. These differences in methodology can affect the comparability of reported life expectancy estimates (OECD, 2009, p16).

1.1.1 Life expectancy at birth, total population (BDA)



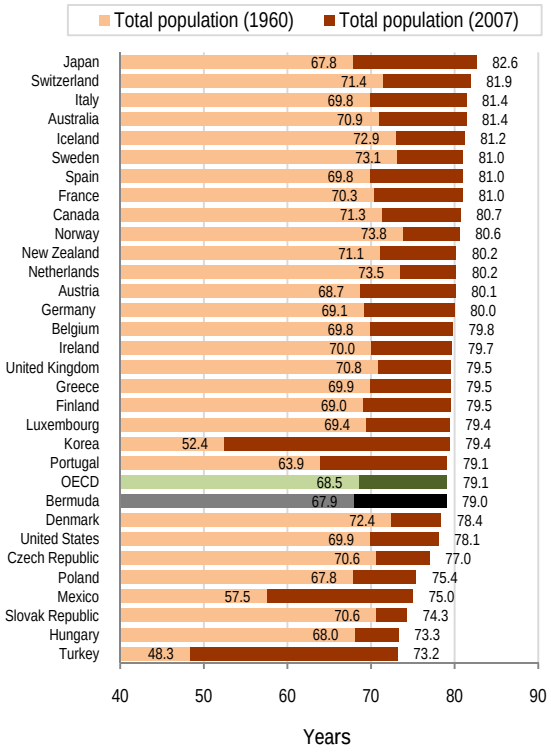
SOURCE: Department of Statistic, Government of Bermuda

1.1.2 Life expectancy at birth, by gender (BDA)



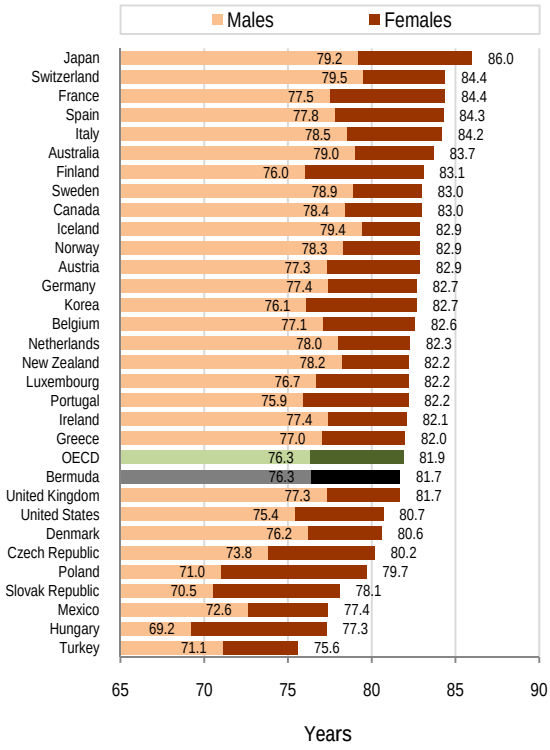
SOURCE: Department of Statistic, Government of Bermuda

1.1.3 Life expectancy at birth, total population, 1960 and 2007 (or latest year available)



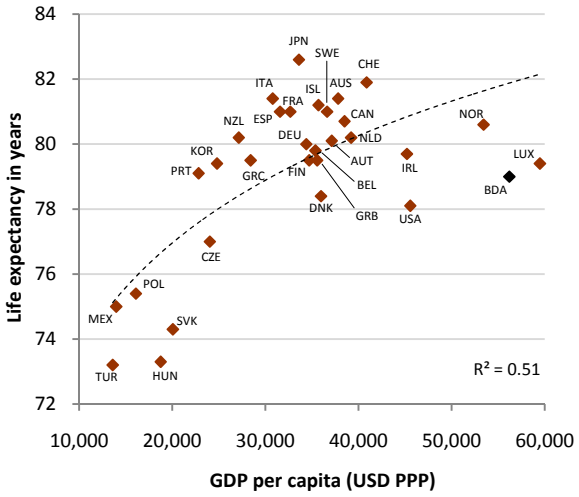
SOURCE: OECD Health Data 2009

1.1.4 Life expectancy at birth by gender, 2007 (or latest year available)



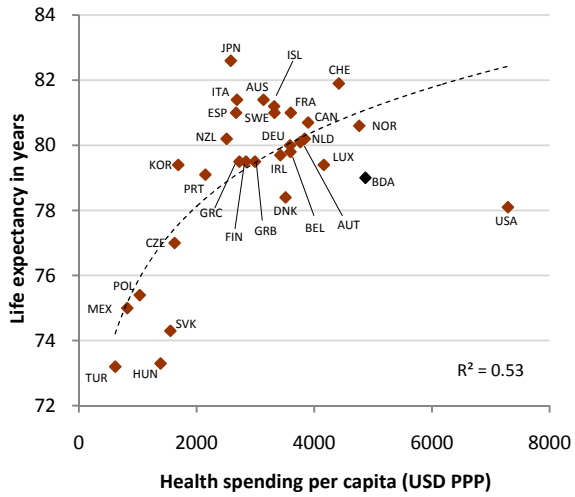
SOURCE: OECD Health Data 2009

1.1.5 Life expectancy at birth and GDP per capita, 2007 (or latest year available)



SOURCE: OECD Health Data 2009

1.1.6 Life expectancy at birth and health spending per capita, 2007 (or latest year available)



SOURCE: OECD Health Data 2009

1.2 Life expectancy at age 65

Life expectancy at age 65 years reflects health status among the aged. As people age, their life expectancy increases as they have survived life periods where people are more prone to early deaths (premature causes of death). Gains in life expectancy at age 65 are generally due to improvements in medical care linked with greater access to healthcare, healthier lifestyles and better living conditions before and after reaching 65 years of age.[6]

Life expectancy at 65 has been steadily increasing since 2000 (Figure 1.2.1). This increase has occurred regardless of gender; however, as with life expectancy at birth, the life expectancy at 65 for females remains greater than for males. Bermuda's gender gap of 3.9 years is wider than the OECD average of 3.3 years, but the gap has narrowed from the 5.4 year difference between genders when comparing life expectancy at birth. As males are more prone to early death, once they reach 65 their life expectancy is more similar to female life expectancy.

Life expectancy at 65, by gender, is below the OECD average (Figures 1.2.2). This is a different standing for Bermuda compared with life expectancy at birth.

These findings indicate that although there are gains in longevity once a person has reached age 65 in Bermuda, the gains are not as great as they are in some OECD countries.

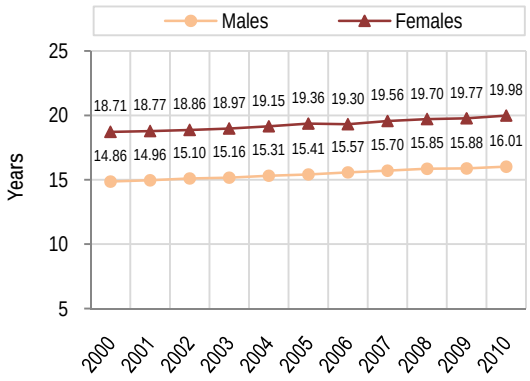
Definition and deviations

Life expectancy measures how long on average people at a particular age would live based on current age-specific death rates. However, the actual age-specific death rates of any particular birth cohort cannot be known in advance. If age-specific death rates are falling – as has been the case over the past decades in OECD countries – actual life spans will be higher than life expectancy calculated with current death rates.

Countries may calculate life expectancy using methodologies that can vary somewhat. These differences in methodology can affect the comparability of reported life expectancy estimates.

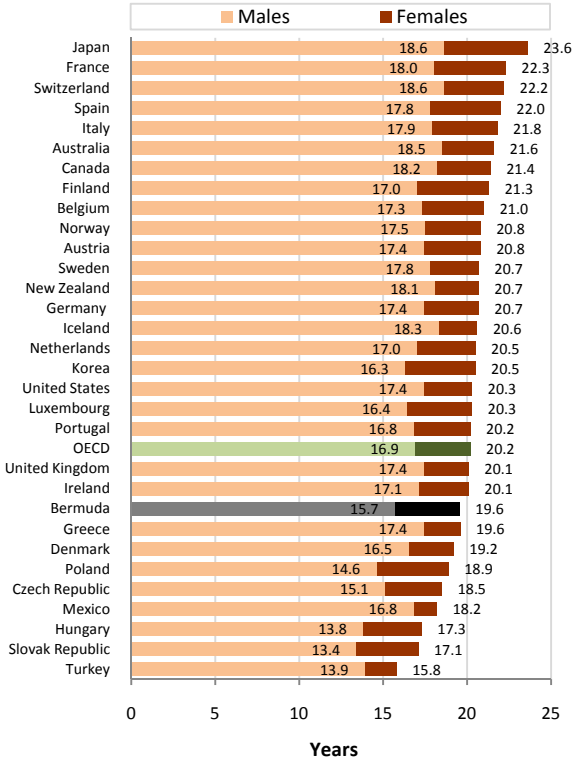
(OECD, 2009, p18)

1.2.1 Life expectancy at age 65, by gender (BDA)



SOURCE: Department of Statistics, Government of Bermuda

1.2.2 Life expectancy at age 65 by gender, 2007 (or nearest available year)



SOURCE: OECD Health Data 2009

1.3 Premature mortality

Premature mortality, measured in terms of potential years of life lost (PYLL) before the age of 70 years, is heavily influenced by infant mortality and deaths from diseases and injuries affecting children and younger adults. PYLL reflects the level of success in preventing premature loss of life and the subsequent loss of social and economic productivity.

Premature deaths tend to be largely preventable including deaths due to external causes such as traffic and industrial fatalities, homicide, suicide, overdose and drowning, and deaths from communicable diseases such as HIV infection. Cancers and circulatory disease deaths at younger than expected ages also contribute to premature mortality and these are generally related to risk factors such as overweight and obesity, smoking, and physical inactivity. PYLL is therefore an indicator of overall population health and well being, and also reflects the effectiveness of preventive programmes.

Following an increase in PYLL from 2000 to 2003 among females, there was a decline from 2005 to 2007 (Figure 1.3.1). A similar decline is seen in males from 2005 to 2007 (Figure 1.3.2). Part of this decline is due to a decrease in deaths among persons with HIV/AIDS (See Indicator 1.5 Mortality rates from communicable diseases).

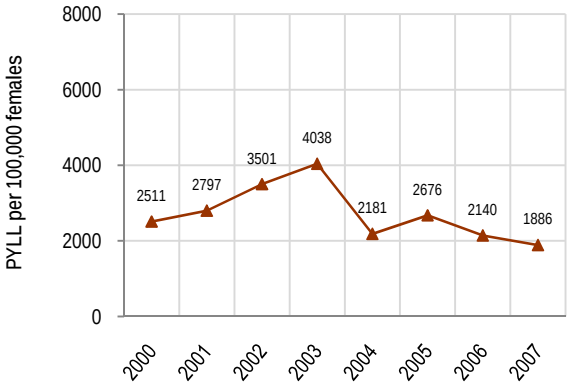
Following the pattern in most other countries, the PYLL for males is consistently and considerably higher than for females. This disparity is reflective of lifestyle differences between males and females in regards to risk factors for early onset of chronic disease, health-seeking patterns, and participation in behaviours that contribute to increased risks of communicable diseases and external causes of death. In comparison to OECD countries, the PYLL for females is lower than the OECD average while the rate for males was considerably higher (Figures 1.3.3 and 1.3.4).

Definition and deviations

The calculation for PYLL involves adding age-specific deaths occurring at each age and weighing them by the number of remaining years to live up to a selected age limit, defined here as age 70. The indicator is expressed per 100,000 females and males.

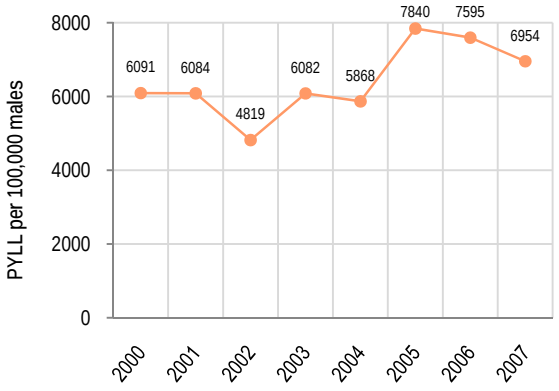
(OECD, 2009, p20)

1.3.1 Potential years of life lost (PYLL), females (BDA)



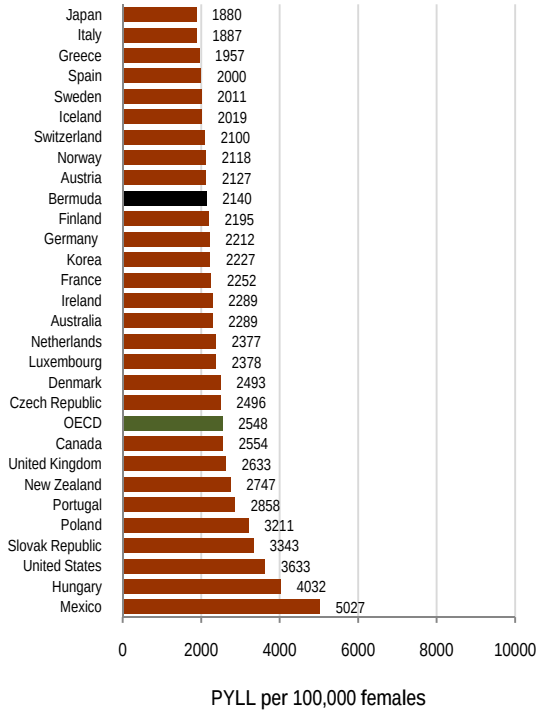
SOURCE: Department of Health, Government of Bermuda

1.3.2 Potential years of life lost (PYLL), males (BDA)



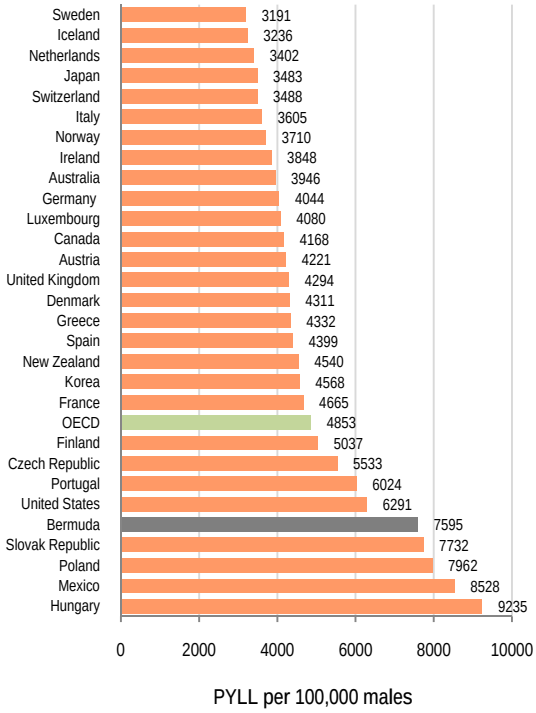
SOURCE: Department of Health, Government of Bermuda

1.3.3 Potential years of life lost (PYLL), females, 2006 (or latest year available)



SOURCE: OECD Health Data 2009

1.3.4 Potential years of life lost (PYLL), males, 2006 (or latest year available)



SOURCE: OECD Health Data 2009

1.4 General mortality rates (all causes)

The general mortality rate is an important indicator for population health. Increases above usual levels are an indication of increased deaths due to epidemics, natural disasters, etc., while decreases are generally due to improved health status of the population. This indicator is also used for international comparisons of overall rates of death.

There has been a very moderate decline in the general mortality rate in Bermuda, irrespective of gender (Figures 1.4.1-1.4.3). This is a reflection of Bermuda's ageing population and increased life expectancy. In other words, people are dying at a slightly slower rate than before. While males have slightly higher death rates, the overall trend does not differ by gender.

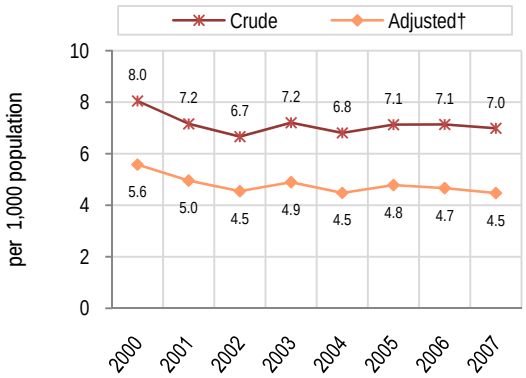
Bermuda's general mortality rates, by total population and by gender, are higher than Canada's, but lower than the North American average, and lower than the rates in the United States.[7]

Definition and deviations

General mortality rates are defined as the estimated total number of deaths in a population of a given sex and age, divided by the total number of this population. When adjusted by age, it is the estimated total number of deaths in a population of a given sex divided by the total number of that population, after removing the effect of differences in the age distribution (PAHO, 2007b).

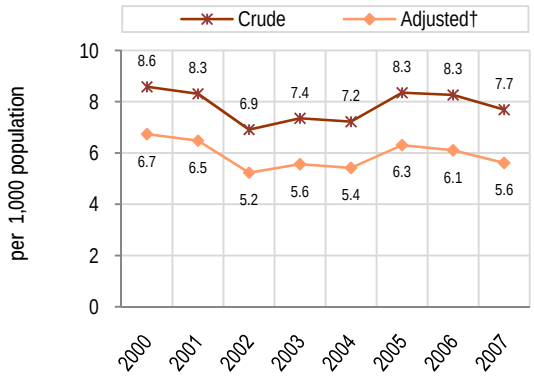
Crude data is provided rather than corrected because under-registration of deaths and deaths from ill-defined causes is negligible in Bermuda.

1.4.1 General mortality rates (all causes), total population (BDA)



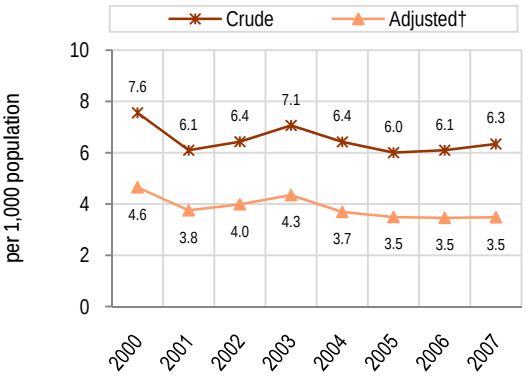
SOURCE: Department of Health, Government of Bermuda

1.4.2 General mortality rates (all causes), males (BDA)



SOURCE: Department of Health, Government of Bermuda

1.4.3 General mortality rates (all causes), females (BDA)



SOURCE: Department of Health, Government of Bermuda

† Age-adjusted mortality rates were computed by direct standardisation to the World Standard Population (2,400 under 1 yr; 9,600 from 1 to 4 yrs; 19,000 from 5 to 14yrs; 43,000 from 15 to 44yrs; 19,000 from 45 to 64yrs; 7,000 65 yrs and older) (WHO, World Health Statistics Annual; 1996 Edition; Geneva, 1998).

1.5 Mortality rates from communicable diseases

Communicable diseases cause, or have the potential to cause, significant disease burden in both morbidity and mortality. They are also diseases for which effective preventive measures are generally available. Mortality rates for communicable disease are useful to understand the underlying prevalence of communicable diseases, give indications of any disease outbreaks and epidemics, and assess the quality of care given to infected persons. In addition, they are necessary for planning and evaluating prevention initiatives.

There is wide variation in communicable disease mortality in Bermuda, with the rates showing a near-cyclical pattern (Figure 1.5.1). This occurs regardless of gender, although males tend to have higher rates of communicable disease mortality than females (Figures 1.5.1 and 1.5.2). The majority of deaths from communicable disease tend to be of two types: older persons dying from pneumonia and younger persons dying from advanced HIV infection or AIDS. Indeed, AIDS-related deaths account for the large increase in communicable disease mortality rates in 2003. Improved treatment for HIV/AIDS have resulted in greater longevity among infected persons, but this has only occurred in recent years. The spike in 2003 is therefore reflective of HIV-infection rates in the decade before and not related to any particular AIDS-related health experience in that year. In other words, it was related to the natural progression of the disease and not any lack of treatment resources.

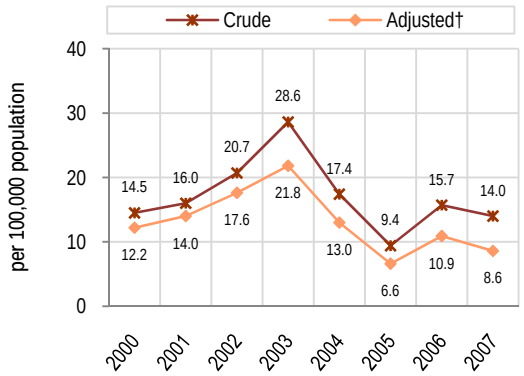
Bermuda's mortality rates from communicable disease, male, female, and overall tend to be more in line with the rates in the United States than Canada.[8]

Definition and deviations

Mortality rates from communicable disease are defined as the estimated total number of deaths from communicable diseases in a population of a given sex and/or age, divided by the total number of this population. When adjusted by age it is the estimated total number of deaths from communicable diseases in a population of a given sex divided by the corresponding total number of this population, after removing the effect of differences in the age distribution (PAHO, 2007b).

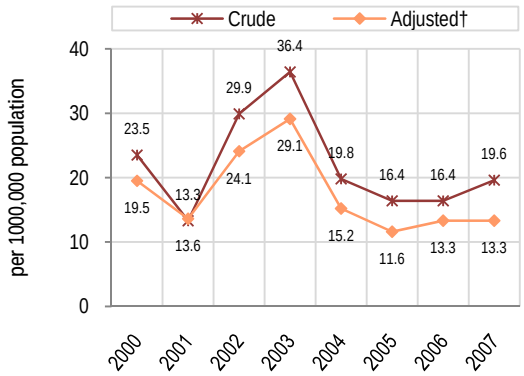
Crude data is provided rather than corrected because under-registration of deaths and deaths from ill-defined causes is negligible in Bermuda.

1.5.1 Mortality rates from communicable diseases, total population (BDA)



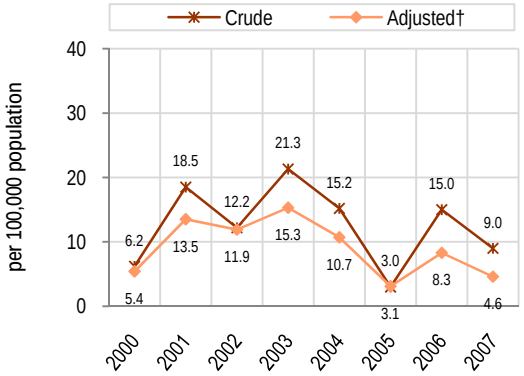
SOURCE: Department of Health, Government of Bermuda

1.5.2 Mortality rates from communicable diseases, males (BDA)



SOURCE: Department of Health, Government of Bermuda

1.5.3 Mortality rates from communicable diseases, females (BDA)



SOURCE: Department of Health, Government of Bermuda

† Age-adjusted mortality rates were computed by direct standardisation to the World Standard Population (2,400 under 1 yr; 9,600 from 1 to 4 yrs; 19,000 from 5 to 14yrs; 43,000 from 15 to 44yrs; 19,000 from 45 to 64yrs; 7,000 65 yrs and older) (WHO, World Health Statistics Annual; 1996 Edition; Geneva, 1998).

1.6 Mortality rates from external causes

Deaths from external causes include transport accidents, falls, drowning, accidental poisoning, and exposure to noxious substances. This category also includes drug overdose, intentional self harm (suicide), assault (homicide), and other deaths occurring as the result of some outside force acting on the body such as electricity, fire, storms, etc. Most of the deaths from external causes are considered avoidable. The analysis of trends in mortality from external causes is therefore important in evaluating the overall effectiveness of preventive interventions.

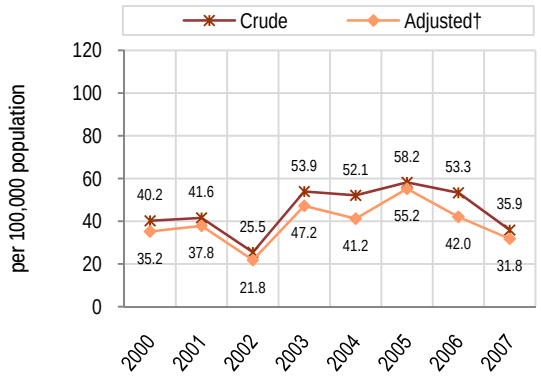
Figures 1.6.1 to 1.6.3 show the external cause mortality rates overall and by gender. Although there is no clear trend in external cause mortality rates, it is clear that males are more likely to die from external causes than females. This is especially true in the younger age groups, where external-cause deaths are mostly transport accidents (See indicator 1.9 Mortality from road accidents). Among older persons, the gender difference is not as dramatic as these deaths are mostly the result of falls.

Definition and deviations

Mortality rates from external causes are defined as the estimated total number deaths from external causes in the total population or of a given sex and/or age, divided by the total number of this population. When adjusted by age, it is the estimated total number of deaths from external causes in the total population, or of a given sex, divided by the total number of this population after removing the effect of differences in the age distribution. (PAHO, 2007b)

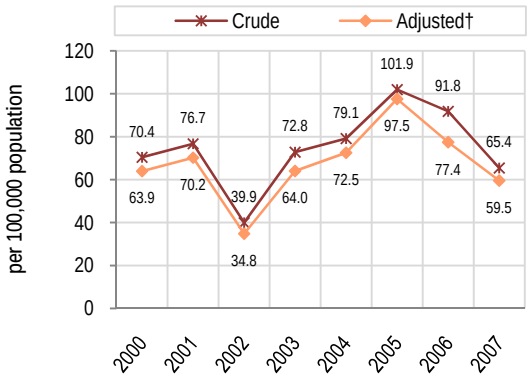
Crude data is provided rather than corrected because under-registration of deaths and deaths from ill-defined causes is negligible in Bermuda.

1.6.1 Mortality rates from external causes, total population (BDA)



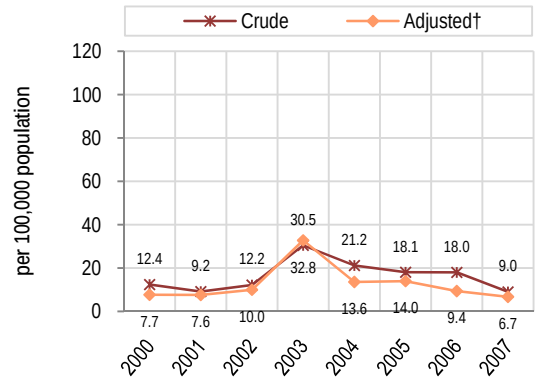
SOURCE: Department of Health, Government of Bermuda

1.6.2 Mortality rates from external causes, males (BDA)



SOURCE: Department of Health, Government of Bermuda

1.6.3 Mortality rates from external causes, females (BDA)



SOURCE: Department of Health, Government of Bermuda

† Age-adjusted mortality rates were computed by direct standardisation to the World Standard Population (2,400 under 1 yr; 9,600 from 1 to 4 yrs; 19,000 from 5 to 14yrs; 43,000 from 15 to 44yrs; 19,000 from 45 to 64yrs; 7,000 65 yrs and older) (WHO, World Health Statistics Annual; 1996 Edition; Geneva, 1998).

1.7 Mortality from heart disease and stroke

Cardiovascular diseases cover a range of diseases related to the circulatory system, including ischemic heart disease (known as IHD, or heart attack) and cerebrovascular disease (or stroke). Heart disease and stroke are preventable. Quality treatment for ischemic heart disease can reduce mortality rates while quality treatment for acute stroke must be timely and efficient to prevent potentially fatal brain tissue death.[9] Declines in mortality rates may also reflect the effectiveness of interventions aimed at preventing cardiovascular diseases.

Mortality from ischemic heart disease has declined in recent years, although death rates remain much higher for men than for women (Figure 1.7.1). Mortality from stroke shows a different pattern with a slight decline in mortality rates among females and no clear trend among males (Figure 1.7.2). The stroke mortality rate is also not as high and the gender difference is not as pronounced as in IHD mortality rates, although men are again more affected. As ischemic heart disease and stroke are closely associated with risk factors such as diabetes, high blood pressure, high cholesterol, and lifestyle factors such as smoking, diet, and physical inactivity, part of the gender gap is due to males being more likely to have these risk factors.

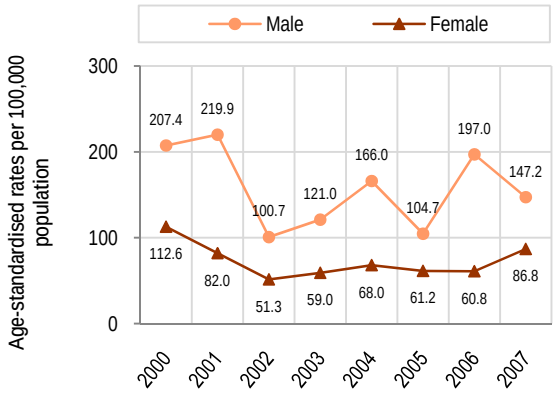
The IHD mortality rate among females in Bermuda compares favourably with the OECD average while the IHD mortality rate for males is 1.5 times higher than the OECD average (Figure 1.7.3). This may be a reflection of slower improvements and resource limitations for the management and care of persons with heart disease in Bermuda compared to other countries. That being said, the overall decline in heart disease mortality in Bermuda may indicate that available treatment and care for persons with heart disease has seen some improvement. The stroke mortality rates, by gender, are on par with the OECD average (Figure 1.7.4).

Definition and deviations

Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database. Mortality rates have been age-standardised to the 1980 OECD population to remove variations arising from differences in age structures across countries and over time within each country.

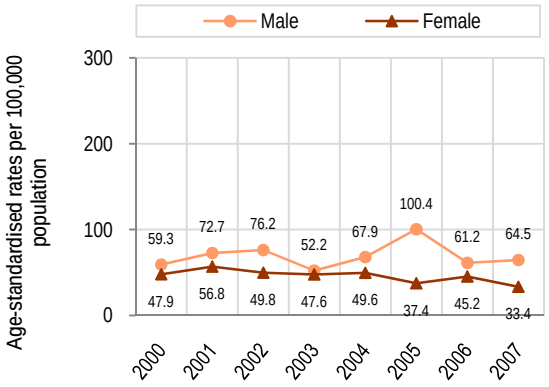
(OECD, 2009, p22)

1.7.1 Ischemic heart disease, mortality rates (BDA)



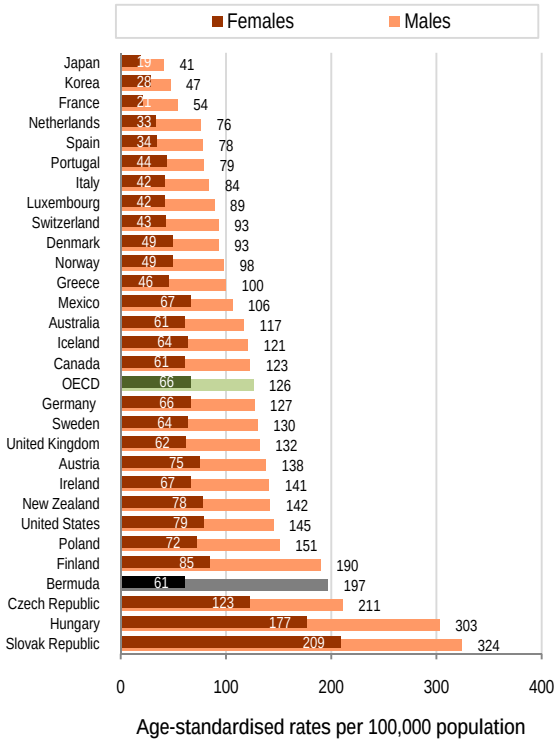
SOURCE: Department of Health, Government of Bermuda

1.7.2 Stroke, mortality rates (BDA)



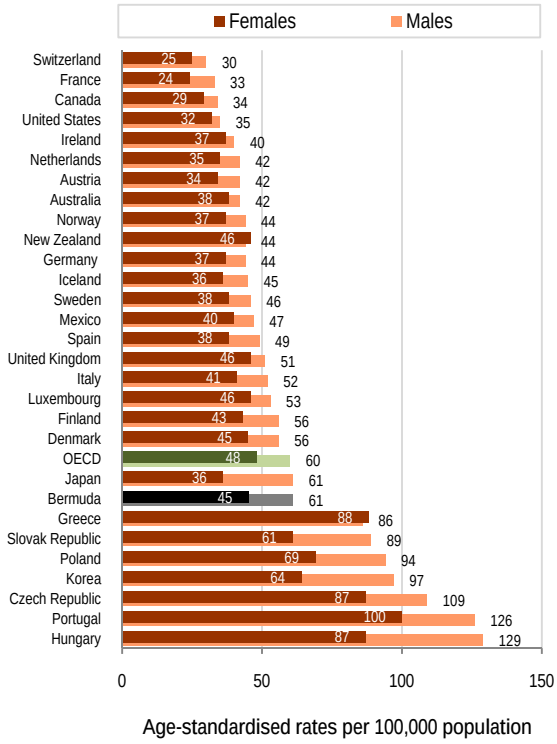
SOURCE: Department of Health, Government of Bermuda

1.7.3 Ischemic heart disease, mortality rates, 2006 (or latest year available)



SOURCE: OECD Health Data 2009

1.7.4 Stroke mortality rates, 2006 (or latest year available)



SOURCE: OECD Health Data 2009

1.8 Mortality from cancer (malignant neoplasm)

Cancer is not a single disease, but rather numerous diseases with different causes, risks, and potential interventions. For example, lung cancer is strongly related to cigarette smoking, exposure to environmental tobacco smoke and certain workplace exposures; dietary behaviours also influence cancer risk. In addition, certain cancers have not proven amenable to primary prevention or screening. An example of this would be prostate cancer, where evidence is mixed and inconclusive regarding the ability of early detection to improve health outcomes, including mortality. Morbidity and mortality from cancers of the lung, colon, rectum, female breast, cervix, and multiple other cancers can be reduced through known interventions. Because certain cancers have a long latency period, years might pass before changes in behaviour or clinical practice patterns affect cancer mortality. Information on cancer at all sites combined provides a measure of, and means of tracking, the substantial burden imposed by cancer.[10]

There has been an overall decline in cancer mortality rates between 2000 and 2007 (Figure 1.8.1). Bermuda's cancer mortality rate for all cancers is lower than the OECD average and on par with the rates in the United States (Figure 1.8.5). As in the OECD countries, Bermuda also displays a gender gap; rates among males are consistently higher than rates among females. This can be partly explained by greater risk behaviours among men, including increased exposure to carcinogens - in the workplace and socially, - and less availability, or use, of screening programmes especially for typically male cancers.

Figure 1.8.2 shows Bermuda's lung cancer mortality rate by gender. Like the OECD countries, the rate among males is higher than the rate in females (Figure 1.8.6). This gender difference reflects past smoking behaviour; men started to smoke earlier and generally smoke more heavily than women. More notably, the female rate is on par with the OECD average, but the male mortality rate is considerably higher, ranking with countries that historically have a high male smoking rate (see Indicator 2.4 Tobacco consumption among adults).

Bermuda has seen an overall decline in breast cancer mortality (Figure 1.8.3). Bermuda's rate is well below the OECD average (Figure 1.8.7). This is likely due to high availability, and use, of mammography screening and improved treatment (see Indicator 5.8 Screening and mortality for breast cancer).

There has been variation in prostate cancer mortality rates during the period under review (Figure 1.8.4). No clear trend can be determined, but recent years are showing an increase. Bermuda's prostate cancer mortality rate is higher than all of the OECD countries (Figure 1.8.8). There are very few known risk factors for prostate cancer but one is race/ethnicity. Black men have a much greater risk of being diagnosed or dying from prostate cancer than men of other races/ethnicities. As Bermuda has a higher proportional population of black men than most of the other countries, this could account for the very high rates in comparison.

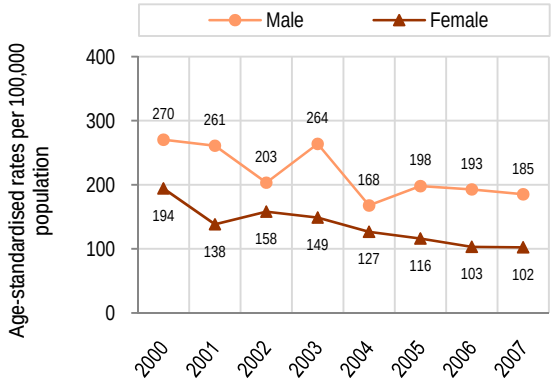
Definition and deviations

Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database. Mortality rates have been age-standardised to the 1980 OECD population, to remove variations arising from differences in age structures across countries and over time within each country.

The international comparability of cancer mortality data can be affected by differences in medical training and practices as well as in death certification procedures across countries.

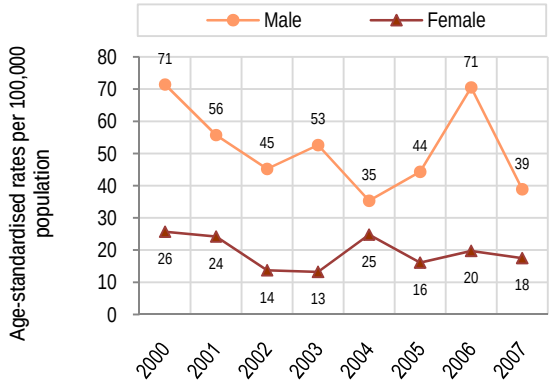
(OECD, 2009, p24)

1.8.1 All cancers, mortality rates, males and females (BDA)



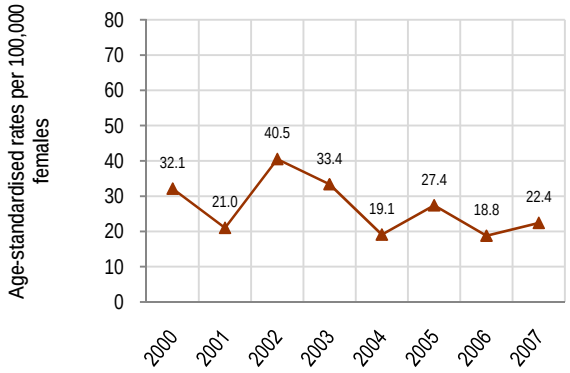
SOURCE: Department of Health, Government of Bermuda

1.8.2 Lung cancers, mortality rates, males and females (BDA)



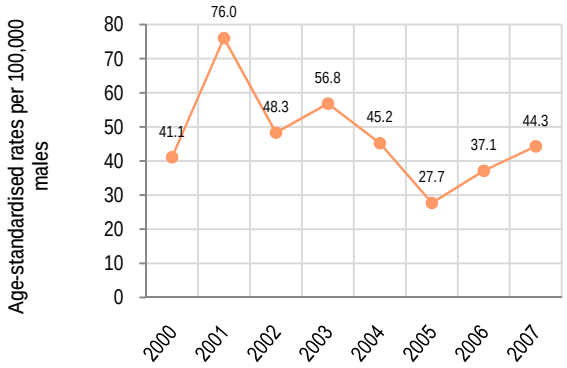
SOURCE: Department of Health, Government of Bermuda

1.8.3 Breast cancers, mortality rates, females (BDA)



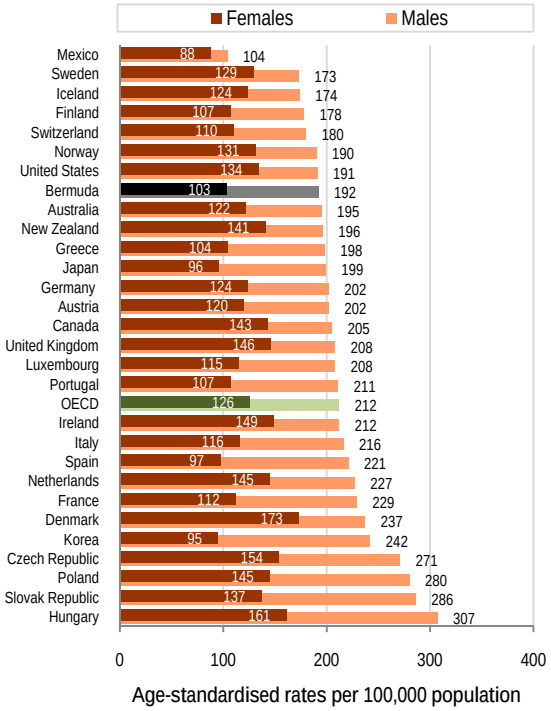
SOURCE: Department of Health, Government of Bermuda

1.8.4 Prostate cancers, mortality rates, males (BDA)



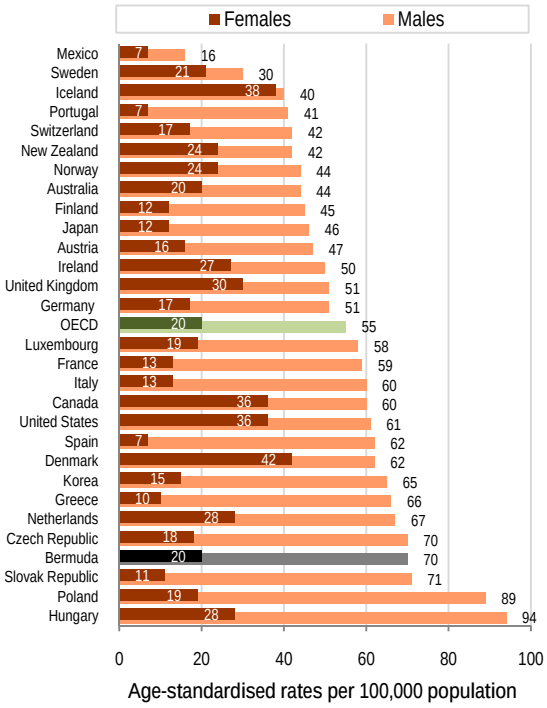
SOURCE: Department of Health, Government of Bermuda

1.8.5 All cancers, mortality rates, males and females, 2006 (or latest year available)



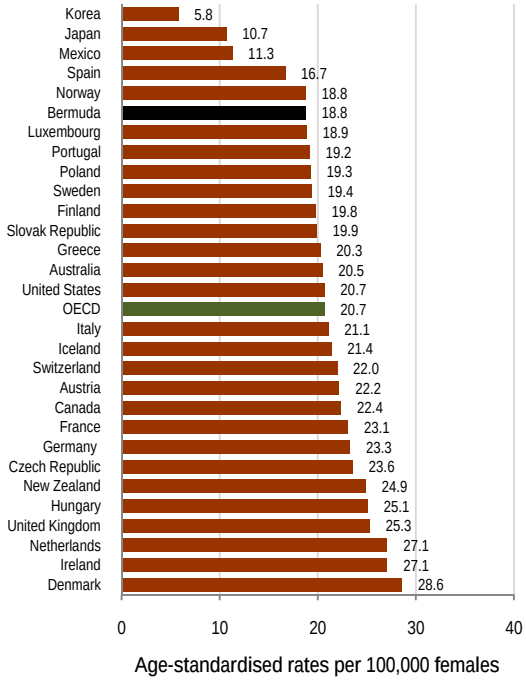
SOURCE: OECD Health Data 2009

1.8.6 Lung cancers, mortality rates, males and females, 2006 (or latest year available)



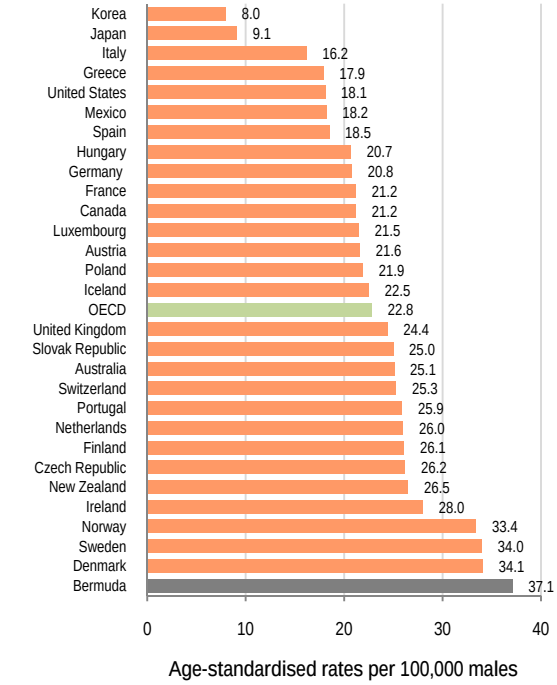
SOURCE: OECD Health Data 2009

1.8.7 Breast cancers, mortality rates, females, 2006 (or latest year available)



SOURCE: OECD Health Data 2009

1.8.8 Prostate cancers, mortality rates, males, 2006 (or latest year available)



SOURCE: OECD Health Data 2009

1.9 Mortality from road traffic crashes

Road traffic crashes are an important area of public health concern because of the significant impact they have on individuals, families, and communities. The resulting pain, disability, psychological trauma, social disruption, and mortality pose a significant economic burden on communities. Although road injuries and deaths are on the increase both globally and in Bermuda, most are preventable. The major contributors to road crashes are driver impairment, speed, lack of driver training, lack of driver experience, and poor road and vehicle engineering.

Although traffic fatalities in Bermuda have fluctuated between 2000 and 2007 (Figures 1.9.1), linear regression analysis indicates a steady and worrisome upward trend. Figure 1.9.2 shows that a majority of road deaths have been men, with women representing a negligible proportion of all fatalities. This corroborates other Bermuda studies, which have demonstrated that over 80% of traffic injuries occur on motorbikes, involve young males, and are 3.2 times more likely among tourists than residents.[11]

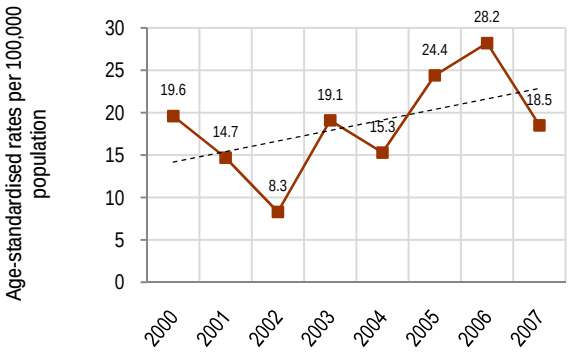
Bermuda's traffic fatality rate in 2006 was over three times higher than the OECD average (Figure 1.9.3). This is especially marked among men, as the OECD average was 14.9 traffic fatalities per 100,000, while the Bermuda rate was 59 per 100,000 (Figure 1.9.4). The higher use of motorcycles in Bermuda than in OECD countries is a significant factor accounting for this greater incidence. Nevertheless, comparison to other jurisdictions with high motorcycle use still places Bermuda among the countries with the highest rate of road fatalities with a rate of 20 per 100,000 in 2009, while Turks and Caicos had a rate of 10.9, Jamaica 12.3, Bahamas 14.5, St. Lucia 17.6, and the British Virgin Islands 21.7.[12]

Definition and deviations

Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database. Mortality rates have been age-standardised to the 1980 OECD population, to remove variations arising from differences in age structures across countries and over time within each country.

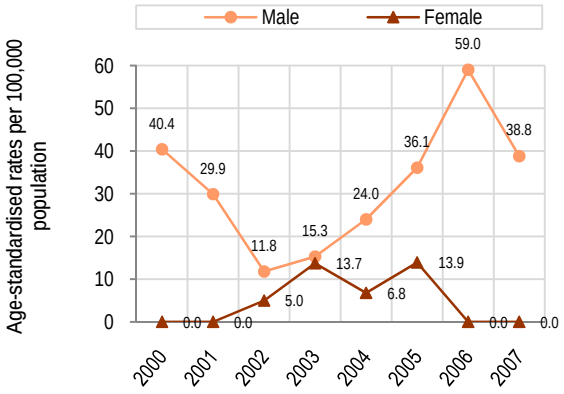
(OECD, 2009, p26)

1.9.1 Road accidents, mortality rates, total population (BDA)



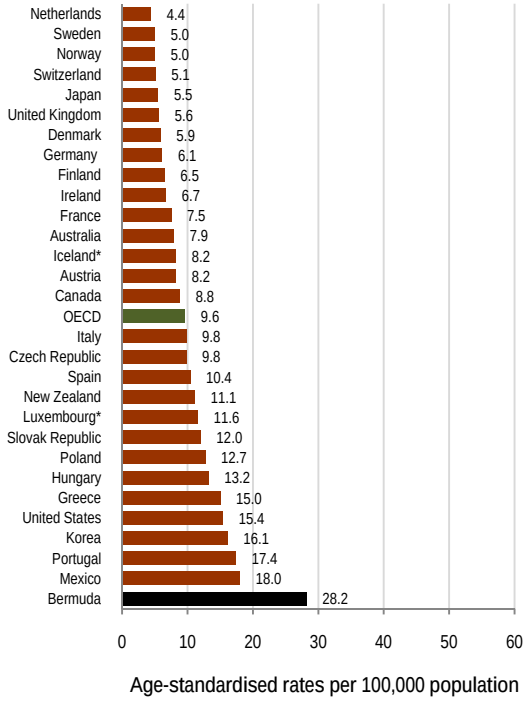
SOURCE: Department of Health, Government of Bermuda

1.9.2 Road accidents, mortality rates, males and females (BDA)



SOURCE: Department of Health, Government of Bermuda

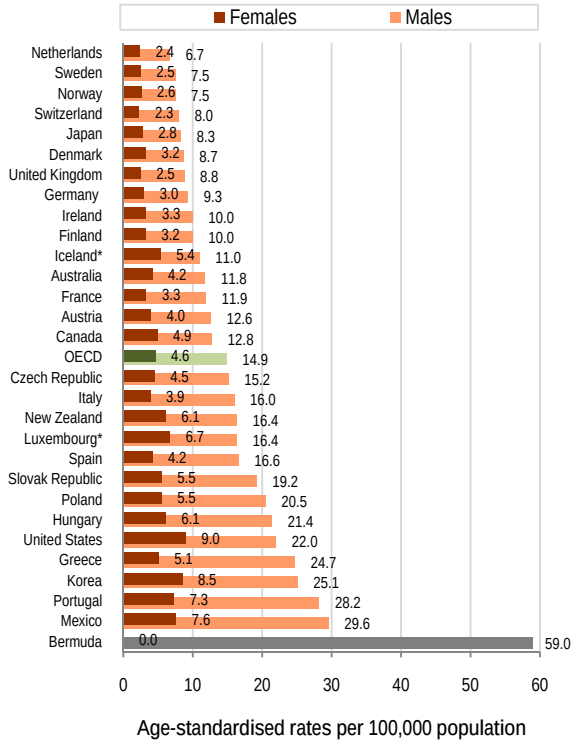
1.9.3 Road accidents, mortality rates, total population, 2006 (or latest year available)



*Three-year average

SOURCE: OECD Health Data 2009

1.9.4 Road accidents, mortality rates, males and females, 2006 (or latest year available)



*Three-year average

SOURCE: OECD Health Data 2009

1.10 Suicide

Suicide mortality rates are an important indicator of the availability and access to mental health services, the general social environment, and the mental health status of the population. Suicides are more likely to occur during crisis periods associated with alcohol and drug use, divorce and other familial issues, unemployment, clinical depression, and various types of mental illness.[13]

Suicide rates are generally low in Bermuda (Figure 1.10.1). In 2006, Bermuda's rates were lower than all of the OECD countries (Figures 1.10.3). Because Bermuda has many risk factors for suicide at what may be considered high levels, the lower rates of suicide could be attributable to the social stigma associated with suicide and to the presence of strong support systems. Other explanations might include the possible effects of the high level of church attendance. Church attendance may be a protective factor or it may lead to under-reporting as has been found in some Catholic countries.

In general, suicide mortality rates are higher among males in Bermuda and worldwide (Figures 1.10.2 and 1.10.4). This may be because women tend to use less easily-fatal methods when attempting to end their own lives than men do.[14] Some clinicians have queried whether suicide attempts may contribute to the high rate of road traffic accidents among young men in Bermuda. However, further research into attempted suicides in Bermuda is required before any valid conclusions can be made.

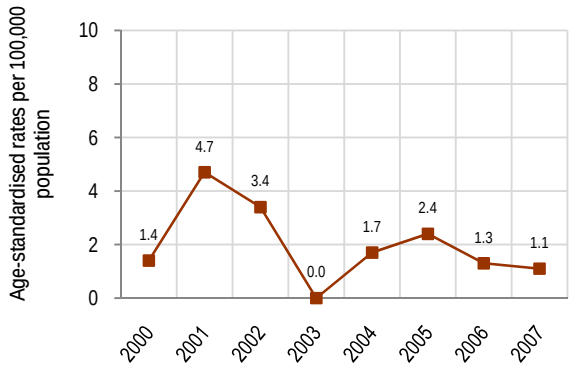
Definition and deviations

The World Health Organisation defines "suicide" as an act deliberately initiated and performed by a person in the full knowledge or expectation of its fatal outcome. Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database. Mortality rates have been age-standardised to the 1980 OECD population, to remove variations arising from differences in age structures across countries and over time within each country.

Comparability of suicide data between countries is affected by a number of reporting criteria, including how a person's intention of killing themselves is ascertained, who is responsible for completing the death certificate, whether a forensic investigation is carried out, and the provisions for confidentiality of the cause of death. Caution is required therefore in interpreting variations across countries.

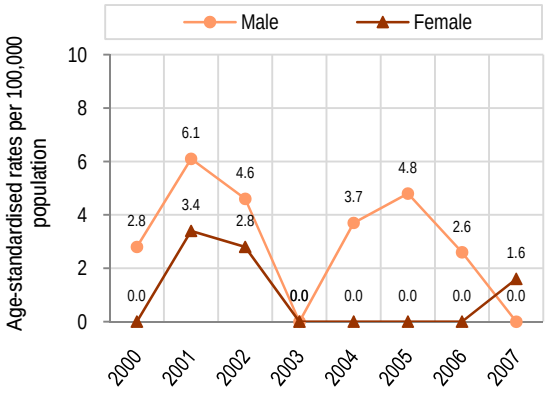
(OECD, 2009, p28)

1.10.1 Suicide, mortality rates, total population (BDA)



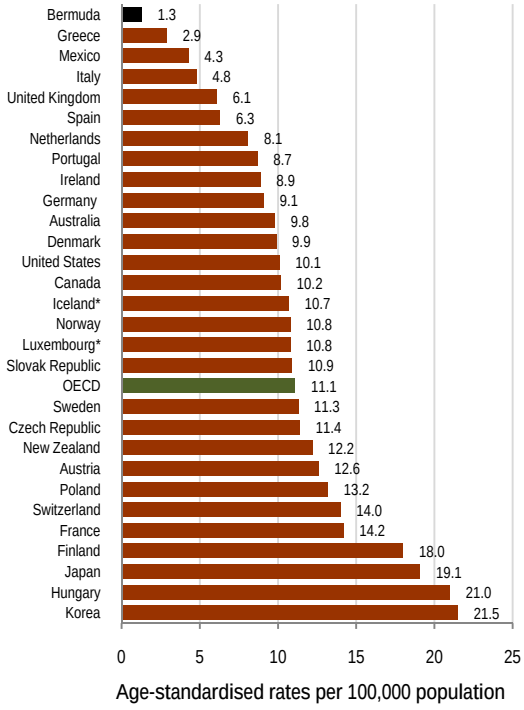
SOURCE: Department of Health, Government of Bermuda. Data is age-standardised to the 1980 OECD population.

1.10.2 Suicide, mortality rates, males and females (BDA)



SOURCE: Department of Health, Government of Bermuda. Data is age-standardised to the 1980 OECD population.

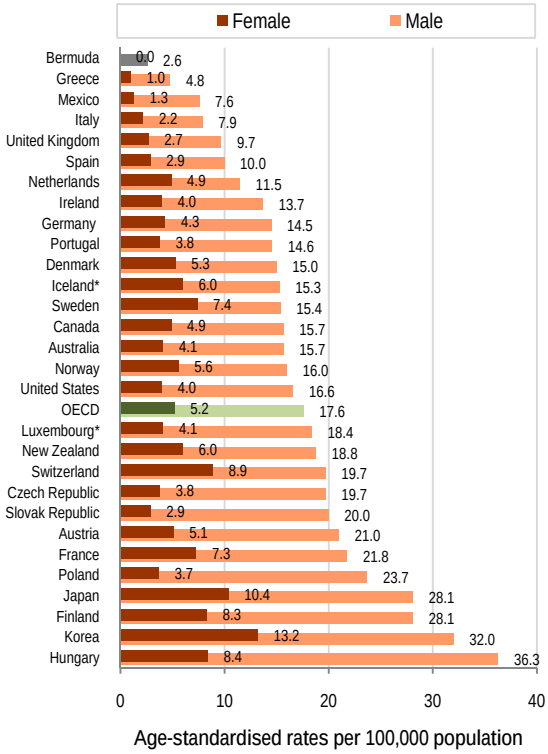
1.10.3 Suicide, mortality rates, total, 2006 (or latest year available)



* Three-year average.

SOURCE: OECD Health Data 2009. Data is age-standardised to the 1980 OECD population.

1.10.4 Suicide, mortality rates, males and females, 2006 (or latest year available)



* Three-year average.

SOURCE: OECD Health Data 2009. Data is age-standardised to the 1980 OECD population.

1.11 Mortality rate from homicide

The mortality rate from homicide allows a comparison from year to year and serves as a proxy measure of the underlying frequency and level/severity of intentional injury in the population. It is affected by changes in trauma care and the lethality of violent assaults. The incidence of homicide is both a cause and a symptom of reduced quality of life, and is associated with numerous social ills, including exclusion and the need for support services.

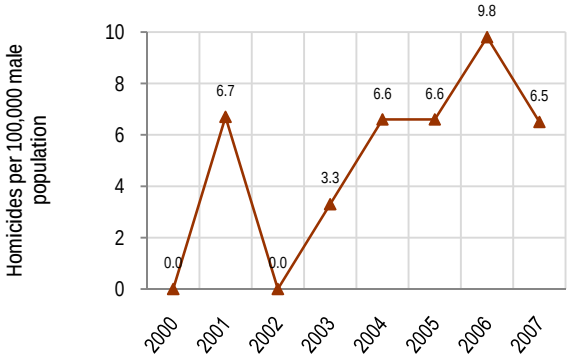
The mortality rate from homicide has increased in recent years (Figure 1.11.1). This has been greatly influenced by the lethality of the weapons used in violent crimes in recent years. More deaths have been attributed to gun violence recently, as opposed to assaults with sharp or blunt objects.

Definition and deviations

Mortality rate from homicide is defined as the estimated total number deaths from homicide and injury purposely inflicted, and injury due to legal intervention or war operations, in the total population or of a given sex and/or age, divided by the total number of this population.

(PAHO, 2007b)

1.11.1 Mortality rate from homicide, total population (BDA)



SOURCE: Department of Health, Government of Bermuda

Photo: R. Matthews

1.12 Infant mortality

Infant mortality is a basic indicator for population health and quality of healthcare services. The infant mortality rate, a measure of survival, also represents the probability of dying during the first year of life and therefore reflects the social, economic, and environmental conditions in which children are born and live. It is in turn a measure of healthcare system performance in perinatal and paediatric care.[15,16]

Bermuda has generally had low infant mortality with an average infant mortality rate of 2.1 infant deaths per 1000 live births during the period under review. The occurrence of these deaths has been variable over the period, but there has been a steady increase from 2004 to 2007 (Figures 1.12.1 and 1.12.2).

Bermuda does not compare favourably to the OECD average for 2007, although the rate is on par with the United Kingdom and Canada and is considerably less than the rate for the United States (Figure 1.12.3). It should be noted that 2007 could be considered a "peak" year for infant mortality, with it having the highest rate for the period under review. This was also a "peak" year for low birth weight (see Indicator 1.15 Infant health: low birth weight). Caution should be used when comparing Bermuda with other countries due to Bermuda's small number of births per annum. The occurrence of two additional coincidental deaths in a given year could result in doubling the infant mortality rate from the previous year. This increase may be unrelated to any change in quality or overall availability of healthcare services. However, the upward trend in infant mortality over several years cannot be dismissed and would require further investigation into possible contributing factors.

As in most other countries, the majority of infant deaths were neonatal deaths generally related to length of gestation (prematurity) and other conditions arising during pregnancy.

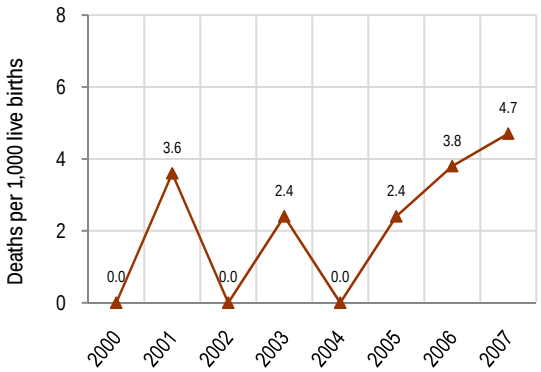
Definition and deviations

Infant mortality rate is the number of deaths of children under one year of age in a given year, expressed per 1000 live births. Neonatal mortality refers to the death of children under 28 days.

Some of the international variation in infant and neonatal mortality rates may be due to variations among countries in registering practices of premature infants. Most countries have no gestational age or weight limits for mortality registration. Minimal limits exist for Norway (to be counted as a death following a live birth, the gestational age must exceed 12 weeks) and in the Czech Republic, France, the Netherlands and Poland a minimum gestational age of 22 weeks and/or a weight threshold of 500g is applied.

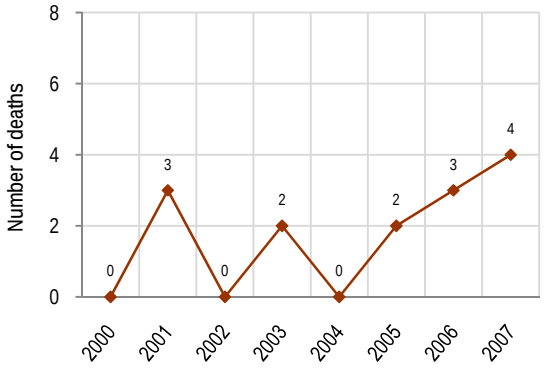
(OECD, 2009, p30)

1.12.1 **Infant mortality rates** (BDA)



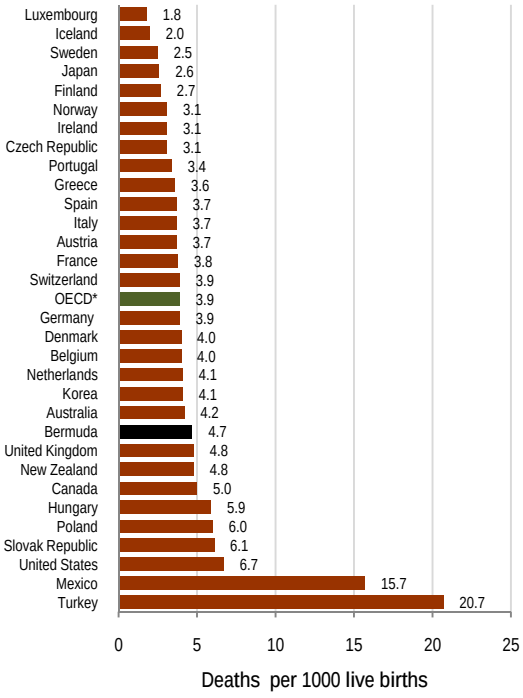
SOURCE: Annual Report of the Registrar General for the Year Ended December 31st 2000, 2005 & 2007.

1.12.2 **Infant mortality, number of deaths** (BDA)



SOURCE: Annual Report of the Registrar General for the Year Ended December 31st 2000, 2005 & 2007.

1.12.3 **Infant mortality rates, 2007** (or latest year available)



*Because of their high rates, Mexico and Turkey are excluded from the OECD average.

SOURCE: OECD Health Data 2009

1.13 Under five mortality

The under-five mortality rate is a measure of child survival. It is the probability of a child born in a specific year dying before reaching the age of five. Therefore, the under-five mortality rate reflects the social, economic, and environmental conditions in which children live, including availability and accessibility of healthcare.

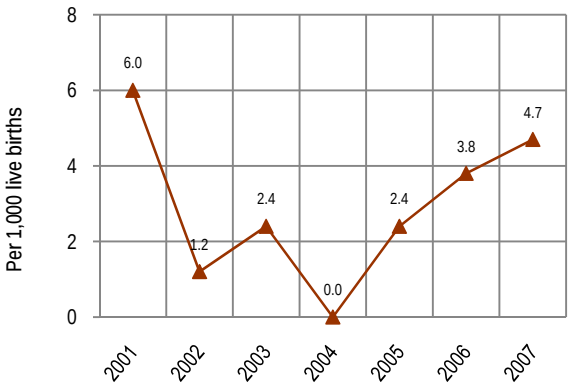
Figure 1.13.1 shows the under–five mortality rate, per 1000 live births and Figure 1.13.2 shows the number of deaths among persons under five years of age. The under-five mortality rates follow the same pattern as the infant mortality rates (See Indicator 1.12 Infant mortality). This is because, with the exception of 2001, all of the under-five mortality was infant mortality, i.e. all of the deaths under five years of age were also under one year of age. The deaths that occurred among children aged one to four years in the period under review were the result of an external cause, in this case, drowning.

Definition and deviations

Under five mortality is defined as the quotient between the number of deaths in children under 5 years of age in a given year, and the number of live births in that year. The under-five mortality rate as defined here is not strictly a rate but a probability of death derived from age-specific mortality patterns and expressed as a rate per 1000 live births (PAHO, 2007b).

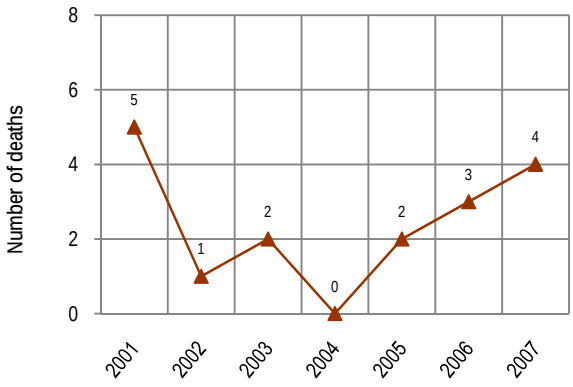
This is a PAHO indicator and therefore figures are not compared to OECD countries.

1.13.1 Under 5 mortality (BDA)



SOURCE: Annual Report of the Registrar General for the Year Ended December 31st 2000, 2005 & 2007.

1.13.2 Under 5 mortality, number of deaths (BDA)



SOURCE: Annual Report of the Registrar General for the Year Ended December 31st 2000, 2005 & 2007.

1.14 Maternal mortality ratio

The maternal mortality ratio monitors deaths related to pregnancy and childbirth. It is a measure of the risk associated with each pregnancy (the obstetric risk) within a country, reflecting the capacity of the health system to provide effective healthcare in preventing and addressing complications which may occur during pregnancy and childbirth.[17]

Figure 1.14.1 shows the number of maternal deaths in Bermuda from 2000 to 2007. Maternal deaths are very rare in Bermuda due to high availability of prenatal care that is of high quality, affordable, accessible and standardised.

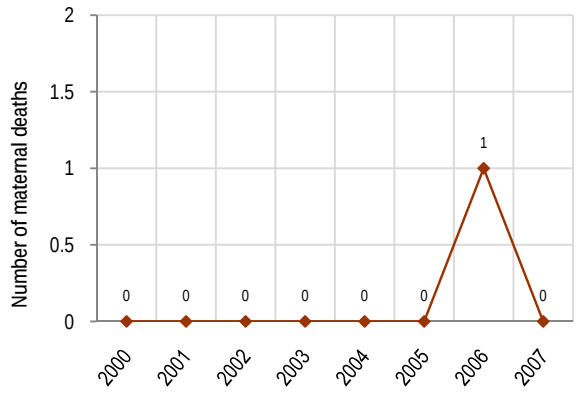
Definition and deviations

Maternal mortality ratio is defined as the quotient between the number of maternal deaths in a given year and the number of live births in that same year. Maternal death is defined as the death of a woman while pregnant or within the 42 days after termination of that pregnancy, regardless of the length and site of the pregnancy, due to any cause related to or aggravated by the pregnancy itself, or its care, but not due to accidental or incidental causes.

In general terms, the maternal mortality ratio reported by the national health authority is an estimate based on vital statistics registries and/or surveys. The methodology can vary from country to country and from period to period, and it is not primarily intended for international comparisons.

(PAHO, 2007b)

1.14.1 Maternal mortality (BDA)



SOURCE: Department of Health, Government of Bermuda

1.15 Infant health: low birth weight

Low birth weight is an important indicator as it is related to the health status of the mother, prenatal care, and the future health status of the infant. Low birth weight infants are more likely to experience poorer health states than their normal weight counterparts.[18]

There is currently insufficient data to make trend observations in regards to low birth weight (Figure 1.15.1). However, Bermuda does compare favourably to OECD countries. Even in what may be considered a "peak" year for Bermuda, the Island's low birth weight percentage in 2007 was slightly below the OECD average (Figure 1.15.2). Given the availability and access to prenatal care, however, it could be expected that Bermuda's rate should be lower. Some clinicians believe there is a correlation between low birth weight infants and lack of health insurance and/or volitional avoidance of antenatal care (despite its availability). However, further investigation into low birth weight infants is necessary to ascertain local causes.

Bermuda follows the general trend of countries reporting a low proportion of low birth weight infants also reporting low infant mortality rates (Figure 1.15.3).

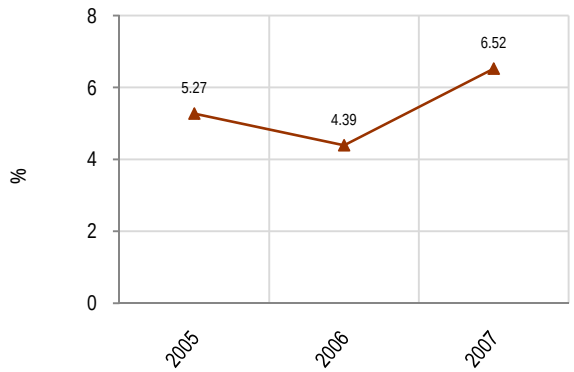
Definition and deviations

Low birth weight is defined by the World Health Organisation (WHO) as the weight of an infant at birth of less than 2 500 grams (5.5 pounds) irrespective of the gestational age of the infant. This is based on epidemiological observations regarding the increased risk of death to the infant and serves for international comparative health statistics. The number of low weight births is then expressed as a percentage of total live births.

The majority of the data comes from birth registers, however for Mexico the source is a national health interview survey. A small number of countries supply data for selected regions or hospital sectors only.

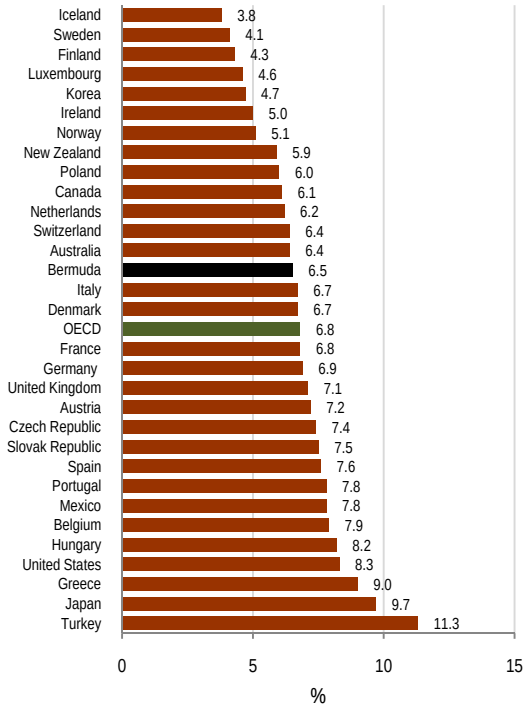
(OECD, 2009, p32)

1.15.1 Low birth weight infants - newborns weighing less than 2,500g (BDA)



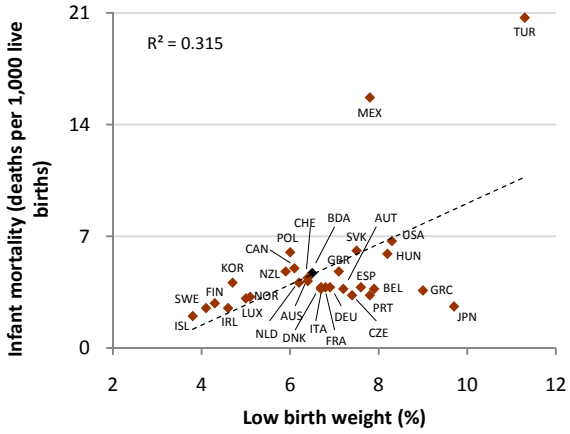
SOURCE: Department of Health, Government of Bermuda

1.15.2 **Low birth weight infants - newborns weighing less than 2,500g, 2007** (or latest year available)



SOURCE: OECD Health Data 2009

1.15.3 **Low birth weight and infant mortality, 2007** (or latest year available)



SOURCE: OECD Health Data 2009

1.16 Dental health among children

Healthy teeth and gums are essential to the overall health of children. Injured, diseased, or poorly developed teeth can result in poor nutrition, painful and dangerous infections, and problems with speech development and self-image. Persons with poor dental health as children are also more likely to have poor dental health as adults, possibly resulting in pain and discomfort, functional impairment, low self-esteem, and dissatisfaction with their appearance. Therefore, dental and other oral diseases signify an important public health concern. Dental diseases are highly correlated with certain lifestyle factors including high sugar diets. These diseases also reflect whether or not protective measures are present such as exposure to fluoride, good oral hygiene, and subsidised dental care for children and adolescents.[19]

Bermuda's DMFT index has been very low, and decreasing during the period under review (Figure 1.16.1) putting Bermuda on par with countries with the lowest DMFTs of all OECD countries and well below the OECD average (Figure 1.16.2). Bermuda's low rates may be attributed to the combined influences of subsidised dental care for children and adolescents and a long-standing school fluoride programme. Over the past 20 years most industrialised countries have noticed a decrease in prevalence rates of dental caries and dental caries experiences. This decrease is said to be an effect of several public health measures, which include fluoride use, altering living conditions, lifestyles, and better self-care habits.[20]

Figure 1.16.3 shows little association between the number of DMFT among children and the number of dentists per capita indicating that many other factors affect dental health beyond the availability of dentists.[21]

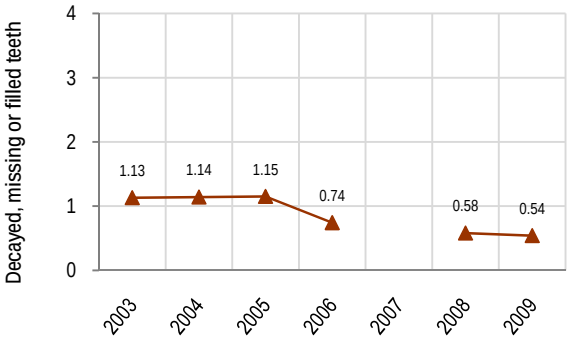
Definition and deviations

A common measure of dental health is the DMFT index. It describes the amount of dental caries in an individual through calculating the number of decayed (D), missing (M), or filled (F) permanent teeth. The sum of these three figures forms the DMFT index. In this instance the data are for 12-year-old children. A DMFT index of less than 1.2 is judged to be very low, 1.2-2.6 is low, 2.7-4.4 is moderate, and 4.5 or more is high.

Norway provides an MFT index, which does not include decayed teeth. Sweden provides a DFT index excluding a measure of missing teeth. The average age for New Zealand children may be slightly above 12. Data for Belgium and Switzerland are regional.

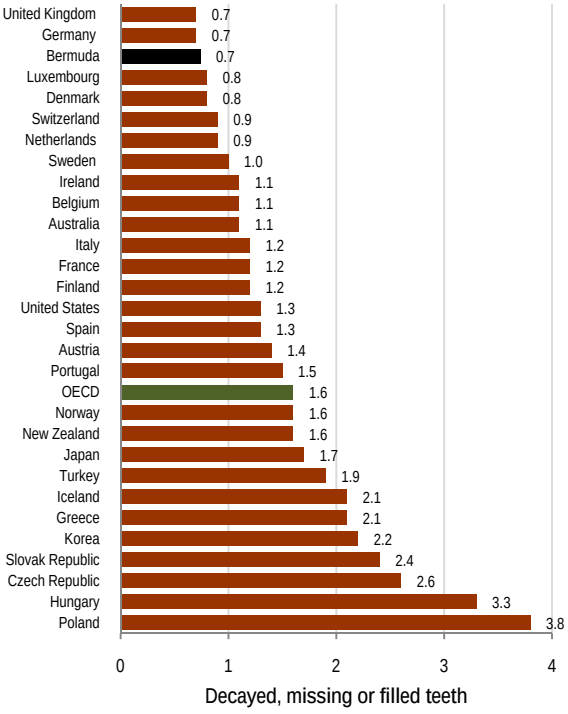
(OECD, 2009, p34)

1.16.1 Average number of decayed, missing or filled teeth, 12-year-old children (BDA)



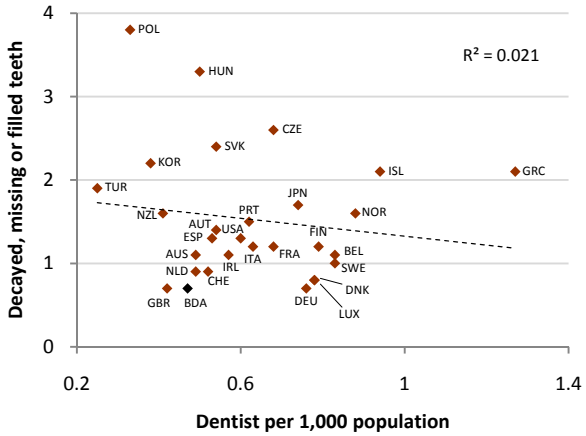
SOURCE: Department of Health, Government of Bermuda

1.16.2 Average number of decayed, missing or filled teeth, 12-year-old children, 2006 (or latest year available)



SOURCE: OECD Health Data 2009

1.16.3 Average number of decayed, missing or filled teeth, 12-year-old children, and dentists per 1,000 population, 2006



SOURCE: OECD Health Data 2009

1.17 Perceived health status

Health status can be difficult to measure and compare. Oftentimes health surveys are used in order to gain a sense of the perceived overall health status of a population, including physical and psychological aspects of health. While this methodological approach can yield subjective results, self-rating of health has been shown to reliably predict future healthcare use and mortality.[22]

An improvement in perceived health status in Bermuda was seen between 1999 and 2006, with more persons rating their health as good, very good, or excellent and, conversely, less persons stating that their health was fair or poor (Figure 1.17.1). Like in most countries, males in Bermuda were more likely to give higher ratings of their health than females (Figures 1.17.2 and 1.17.4).

The percentage of adults reporting good health in Bermuda is considerably higher than the OECD average; however, the response scale differed from most of the OECD countries (Figure 1.17.3). Looking at Bermuda's responses compared only to countries with similar response scales, Bermuda is on par with the average of these countries.

Definition and deviations

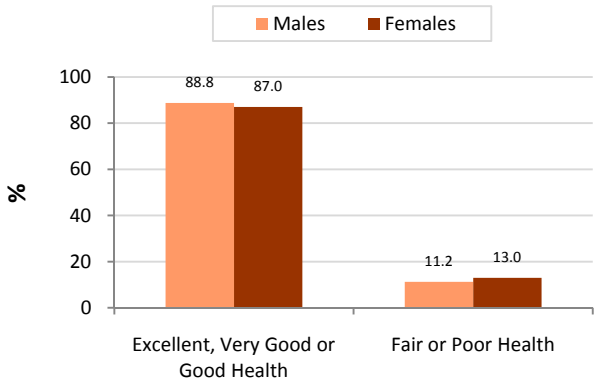
Surveys generally ask respondents a question such as: "How is your health in general? Very good, good, fair, poor, very poor". The OECD data present the percentage of people who have rated their health as "good" or "very good".

Caution is warranted when comparing perceived health status data across countries, due to a number of limitations. One notable limitation is the variations found between survey questions and answer categories. For example, the response scale used in surveys from Australia, Bermuda, Canada, New Zealand, and the United States have more positive responses than negative (asymmetric). These are "excellent, very good, good, fair, and poor". As such, the OECD Health Data for these countries reflect three positive responses for adults reporting to be in good health. On the other hand, most OECD member countries have a balance of positive and negative responses (symmetric), "very good, good, fair, poor, and very poor" and only reflect two positive responses (OECD, 2009). A further limitation is the subjective nature of asking people to judge their health. Responses can be affected by differing expectations and norms of health, which can vary across cultural and ethnic groups, economic levels, overall level of industrialisation or development, etc.[23]

1.17.1 State of general health, 1999 and 2006 (BDA)

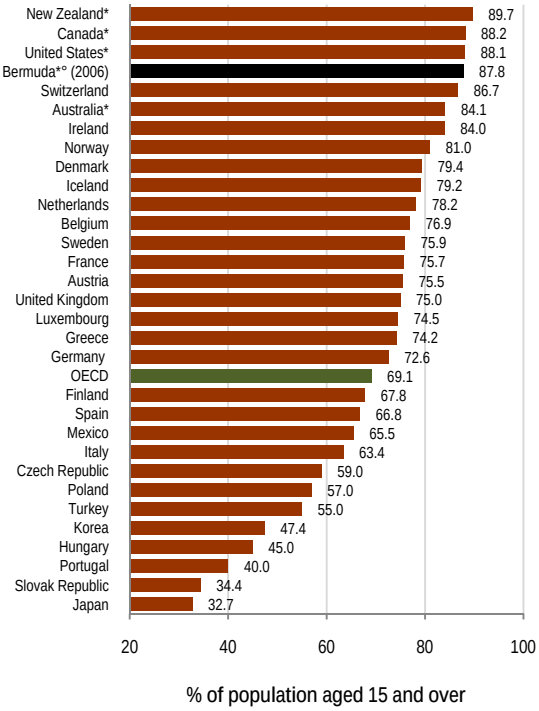
*SOURCE:*The Adult Wellness Report 1999. † Health Survey of Adults and Children in Bermuda 2006.* **NOTE:** Caution should be taken when comparing the 1999 study results with the 2006 due to variations in answer categories used to measure perceived health status. The 1999 answer categories were (a) fair to poor health, and (b) very good to excellent. The 2006 answer categories were (a) fair or poor health, and (b) excellent, very good or good health.

1.17.2 State of general health, by gender, 2006 (BDA)

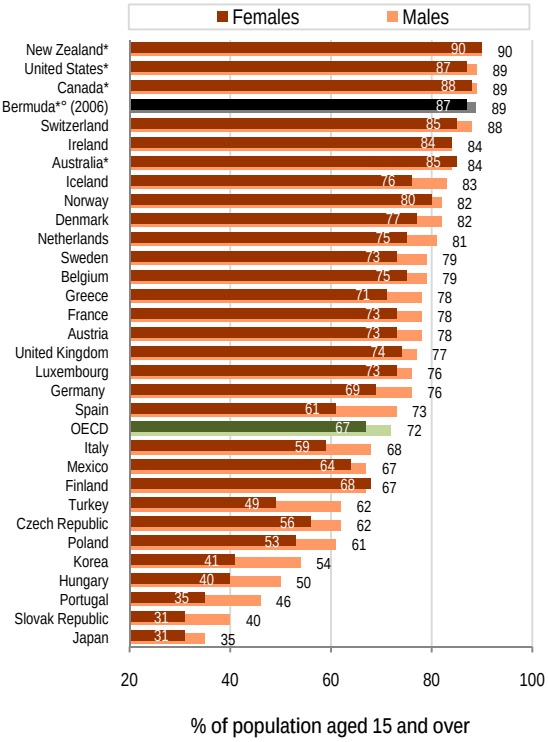


SOURCE: Health Survey of Adults and Children in Bermuda 2006

1.17.3 Percentage of adults reporting to be in good health, females and males combined, 2007 (or latest year available)



1.17.4 Gender differences in the percentage of adults reporting to be in good health, 2007 (or latest year available)



*Results for these countries are not directly comparable with those from other countries, due to methodology differences in the survey questionnaire resulting in an upward bias. °Population aged 18 and over.

SOURCE: OECD Health Data 2009

SOURCE: OECD Health Data 2009

1.18 Diabetes prevalence and mortality

Diabetes prevalence and mortality rates are important indicators of the health status of a population. While there aren't many known risk factors for type 1 diabetes, type 2 diabetes is largely preventable as it is related to overweight and obesity, and to physical activity. An increase in diabetes prevalence is therefore associated with related increases in overweight, obesity, and sedentary behaviour in a population. Following the diagnosis of diabetes, multiple long-term complications can be prevented through glucose, lipid, and blood pressure regulation, and through screening and treatment for eye, foot, and kidney abnormalities. Means to prevent complications and deaths due to diabetes include improved patient education and self-management, and provision of adequate and timely screening services and medical care. Diabetes prevalence and mortality rates are, therefore, also an indicator of the availability of screening and other prevention initiatives. In addition, these indicators are necessary for planning prevention and healthcare services and are important for the evaluation of policies related to diabetes screening and care.

Diabetes mortality rates have varied considerably over the period under review, with similar rates at the beginning and end of the period (Figure 1.18.1). As the rates in the middle years were higher, it would be premature to conclude that Bermuda is experiencing a stabilisation of diabetes mortality rates. Overall, diabetes mortality (crude) has decreased in males and increased in females (Figures 1.18.2 and 1.18.3) although the rates have fluctuated throughout the years.

Diabetes prevalence in Bermuda is at epidemic levels; it is more than twice the level of the OECD average, and is exceeding the prevalence in all OECD countries (Figure 1.18.4).

Definition and deviations

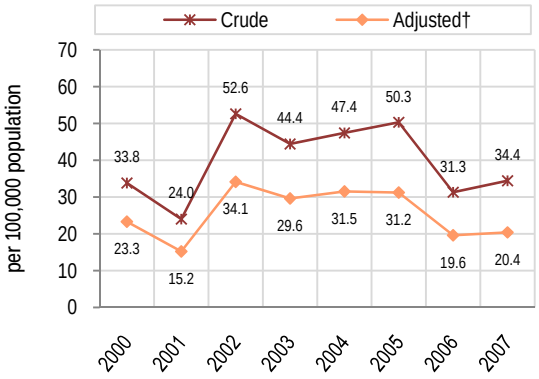
Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database. Rates are adjusted to the World Standard Population to remove variations arising from differences in age structures across countries and over time within each country. (PAHO, 2007b)

The Diabetes Atlas (4th edition) describes the sources and methods applied by the International Diabetes Federation for prevalence estimates of diabetes. Data for countries were taken from published studies between 1980 and February 2009, and were only used if they adhered to various criteria for reliability. In order to compare data across countries, prevalence rates were adjusted to the World Standard Population.

Self-reported data on diabetes was provided by a number of countries (i.e. Canada, France, Italy, Netherlands, Norway, and the United Kingdom). The prevalence of diabetes for Canada and the United Kingdom was multiplied by a factor of 1.5, to account for undiagnosed diabetes. This is in keeping with results from the United States (and for Canada) and local recommendations (for the United Kingdom). Prevalence was doubled for other countries, based on data from several of nations. (OECD, 2009)

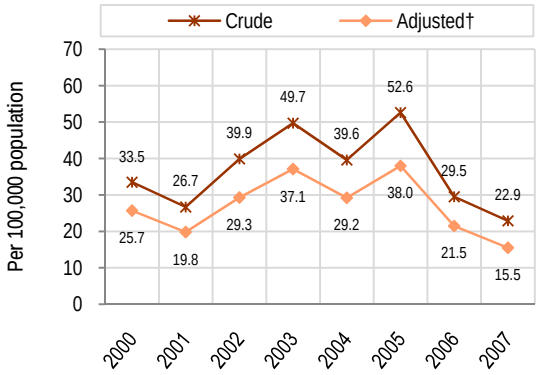
The data for the prevalence in Bermuda was derived from the *Health Survey of Adults and Children in Bermuda* (2006) and was not adjusted to the World Standard Population. Mortality rate for diabetes is a PAHO indicator and therefore figures are not compared to OECD countries. Crude data is provided rather than corrected because under-registration of deaths or deaths from ill-defined causes is negligible in Bermuda.

1.18.1 Mortality rate from diabetes mellitus, total population (BDA)



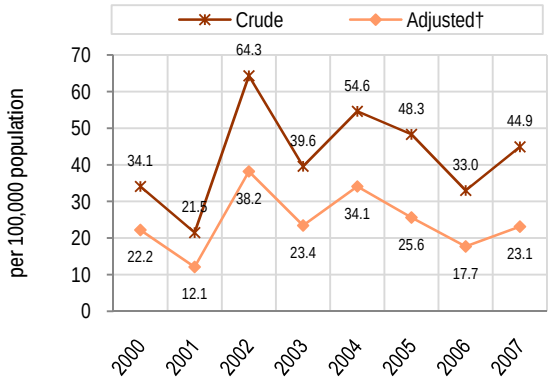
SOURCE: Department of Health, Government of Bermuda

1.18.2 Mortality rate from diabetes mellitus, males (BDA)



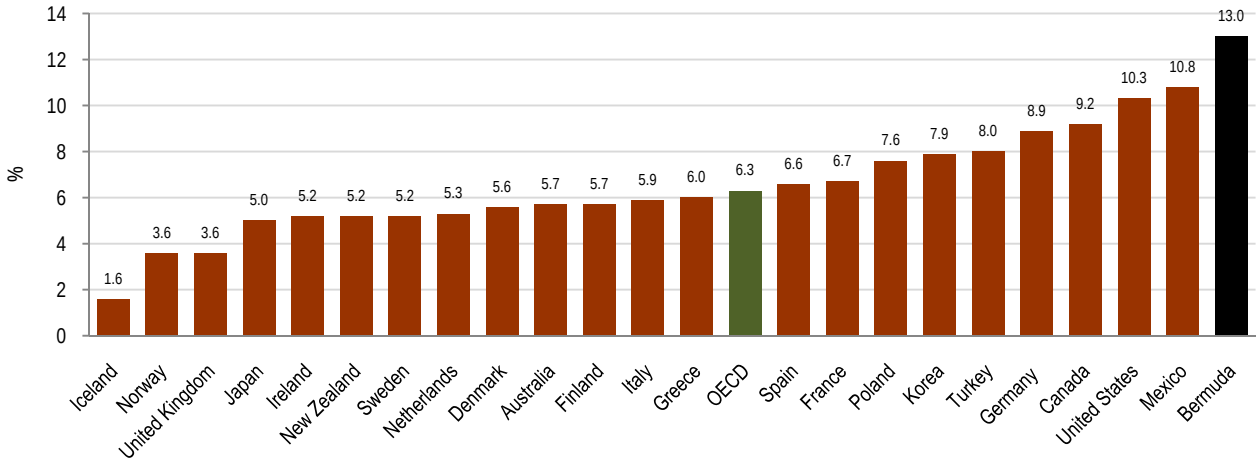
SOURCE: Department of Health, Government of Bermuda

1.18.3 Mortality rate from diabetes mellitus, females (BDA)



† Age-adjusted mortality rates were computed by direct standardisation to the World Standard Population (2,400 under 1 yr; 9,600 from 1 to 4 yrs; 19,000 from 5 to 14yrs; 43,000 from 15 to 44yrs; 19,000 from 45 to 64yrs; 7,000 65 yrs and older) (WHO, World Health Statistics Annual; 1996 Edition; Geneva, 1998).
SOURCE: Department of Health, Government of Bermuda

1.18.4 Prevalence estimates of diabetes, adults aged 20-79 years, 2010



SOURCE: Diabetes Atlas, 4th edition. **NOTE**: The data are age-standardised to the World Standard Population.

1.19 AIDS incidence

Acquired Immunodeficiency Syndrome (AIDS) is the most advanced stage of HIV (Human Immunodeficiency Virus) infection. At this stage, the virus has severely limited the immune system. AIDS can manifest itself as any number of diseases or opportunistic infections. A diagnosis of AIDS can be made on either the presence of an opportunistic infection or by laboratory analysis of markers in the immune system. Treatment for HIV slows the progression of the virus in the body.[24] Therefore AIDS incidence is a measure of the efficiency of the management and care of HIV-infected persons. It is important to note that AIDS incidence is also a function of HIV screening; the more people screened, the greater the probability of diagnosis.

As there is a time lag between HIV infection and AIDS diagnosis, AIDS incidence tends to reflect HIV infection rates sometime in the previous decade. Figure 1.19.1 shows the declining trend in AIDS incidence in Bermuda. The decline was, initially, quite rapid, but has slowed in recent years. This may be attributable to complacency regarding the seriousness of the disease.

Bermuda, like the United States, expanded the case reporting definition of AIDS in the early 1990s, hence the similar rates, which are both considerably higher than the OECD average (Figure 1.19.2).

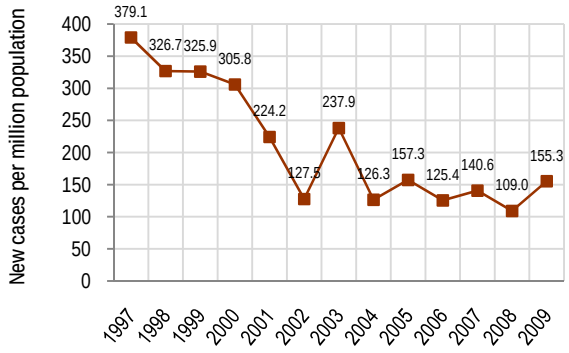
Definition and deviations

The AIDS incidence rate is measured by the number of new cases per million population at year of diagnosis.

Due to reporting delays, the data for recent years are tentative. This can be quite a number of years, depending on the country. In 1993 the United States broadened their AIDS surveillance case definition, thereby including T-lymphocyte count in the criteria. As a result of this expanded definition, there has been a considerable rise in the number of new cases in the United States in 1993 and helps clarify some of the present disparities in AIDS incidence between other OECD countries and the United States.

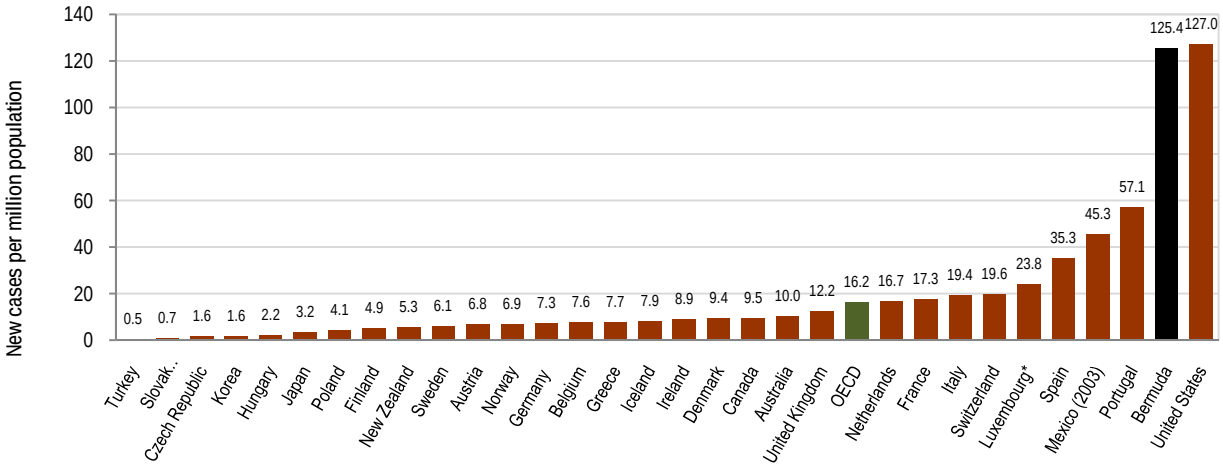
(OECD, 2009)

1.19.1 **AIDS incidence rates** (BDA)



SOURCE: Department of Health, Government of Bermuda

1.19.2 **AIDS incidence rates, 2006** (or latest year available)



*Three-year average (2004-06).

SOURCE: OECD Health Data 2009

1.20 Tuberculosis incidence

Tuberculosis incidence gives an indication of the burden of TB in a population and the task faced by a TB or communicable disease control programme. Incidence can change as the result of changes in transmission (the rate at which people become infected with *Mycobacterium tuberculosis*, the bacterium that causes TB), or changes in the rate at which people infected with *Mycobacterium tuberculosis* develop TB disease (e.g. as a result of changes in nutritional status or of HIV infection). Because TB can develop in people who became infected many years previously, the effect of TB control on incidence is less rapid than the effect on prevalence or mortality.[25] Some groups are at higher risk for developing TB than others, including foreign-born individuals and people co–infected with HIV. The increase and ease of international travel can allow for increases in TB incidence in a non-endemic population.[26]

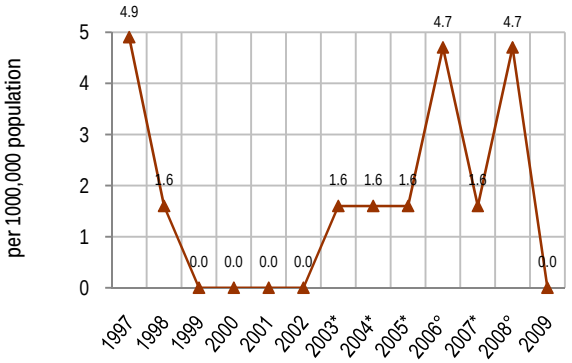
Tuberculosis is not endemic in Bermuda, however, persons living and working in Bermuda from places were tuberculosis is endemic may become symptomatic while on island. As the transmission of the infection occurred outside of Bermuda, these cases are classified as imported. The sporadic TB cases, in recent years have all been imported (Figure 1.20.1 and 1.20.2). Bermuda's TB incidence rates (all forms) are generally lower than the rates in the United States and Canada; while, the Sputum Smear Positive (SS+) rates are lower than the rates in the United States, but on par with Canada's rates.[27]

Definition and deviations

Tuberculosis incidence is measured by the number of new cases registered from tuberculosis (all forms) in a specified year. Sputum Smear Positive (SS+) tuberculosis is a more precise measure of infectious tuberculosis or active TB disease.

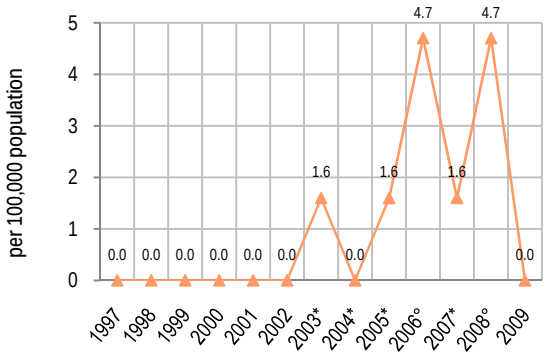
(PAHO, 2007b)

1.20.1 Tuberculosis incidence rate, total population (BDA)



SOURCE: Department of Health, Government of Bermuda. **NOTE:** Confirmed cases only, *Imported one case; °Imported three cases

1.20.2 Sputum smear positive (SS+), total population (BDA)



SOURCE: Department of Health, Government of Bermuda. **NOTE:** Confirmed cases only, *Imported one case; °Imported three cases

1.21 Malaria and dengue reported cases

Malaria and dengue are serious diseases that can be fatal. Both are caused by a parasite which is spread through the bites of infected mosquitoes. Malaria can rapidly become life-threatening if left untreated.[28] It ranks fifth in the cause of death from infectious diseases globally (after respiratory infections, HIV/AIDS, diarrheal diseases, and tuberculosis).[29] Dengue has been a global problem since the 1950s[30] and in more recent decades it has become a major universal public health concern. The only means of controlling or preventing its transmission is to combat mosquitoes that carry the virus.[31]

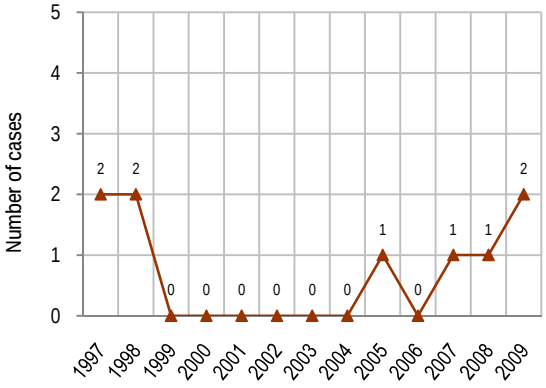
Bermuda has sporadic cases of malaria and dengue, all of which have been classified as imported (Figure 1.21.1 and 1.21.2). These cases occurred in travellers and immigrants returning from countries where malaria and dengue transmission occurs. An increase in imported cases is related to increased immigration and international travel. As Bermuda does not currently have the species of mosquito that can carry the virus, there cannot be any local transmission. Caution, however, must be maintained regarding the possible importation of the vector. Imported cases of dengue are of greater concern because Bermuda does have the species of mosquito capable of carrying the virus. Surveillance and investigation of all suspect cases of dengue and malaria and control of the mosquito population are vital in preventing local transmission.

Definition and deviations

Reported cases of malaria are measured by the number of cases registered in a specified year. Dengue reported cases are measured by the number of cases registered from dengue in a specified year.

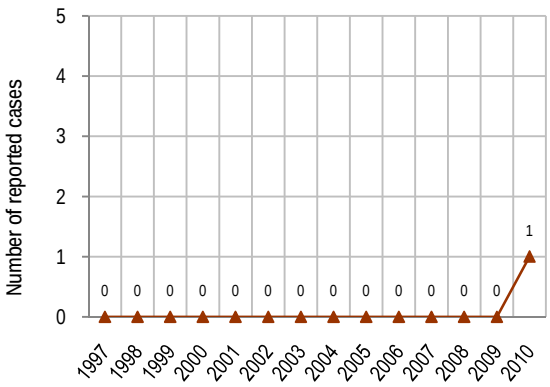
(PAHO, 2007b)

1.21.1 Malaria reported cases (BDA)



SOURCE: Department of Health, Government of Bermuda. **NOTE:** All cases imported. Bermuda is not an endemic nation and therefore there are no risk areas - parasite index cannot be calculated.

1.21.2 Dengue reported cases, (BDA)



SOURCE: Department of Health, Government of Bermuda. **NOTE:** Confirmed cases only, all cases imported.

2. SOCIAL DETERMINANTS OF HEALTH

2.1 Smoking and alcohol consumption among students

Substantial evidence has shown that health problems associated with smoking are directly related to the duration (years) and intensity (amount) of use. Earlier usage means there is a longer period of tobacco use and a greater likelihood of more serious health consequences. Even in youth, there are consequences to early smoking including a reduced rate of lung growth, a lower level of lung function, decreased physical fitness, significantly increased likelihood of shortness of breath, coughing spells, phlegm production, wheezing, and overall diminished health. Early usage is also correlated to heavier usage, which further increases the risk of smoking-related health issues. The younger one starts to smoke, the greater probability one will be a smoker as an adult. [32]

There is also evidence that shows the earlier the onset of drinking, the greater the chance one will have alcohol –related injuries and alcohol dependence later on in life. Among the numerous negative consequences as a result of alcohol use among young people are: alcohol-related motor vehicle collisions, homicide, suicide, and drowning. All of these consequences have significantly contributed to mortality statistics; especially, premature loss of life. [33]

Figure 2.1.1 shows, among adolescent respondents, increases in lifetime prevalence and 30-day prevalence of alcohol and marijuana consumption, but decreases in lifetime prevalence and 30-day prevalence of cigarette consumption. Figures 2.1.2 and 2.1.3 both show moderate decreases in adolescents reporting smoking and alcohol consumption within the past 30 days. The increase in alcohol consumption may be attributed to the lack of data from senior high school students in the 2006 survey.

The 2007 Bermuda data indicates that two out of every three adolescents reported ever consuming alcohol which is slightly less than the 75% of all adolescents reporting alcohol consumption in their lifetime in the United States. Bermuda also has lower rates than the United States for the 30-day prevalence of alcohol consumption – 37.5% compared to 43.3%. Reported rates of cigarette and marijuana consumption in Bermuda are also lower than the rates in the United States. [34]

Definition and deviations

There have been several surveys conducted among Bermuda's middle and high school age children. Definitions and measurements between these surveys differ.

Communities that Care Youth Survey (2003, 2007) - measured alcohol, cigarette, and marijuana consumption by asking M2-S4 school children (aged 11-18 years) had they ever used the drug (experimentation) and if the drug was used within the last month (current use).

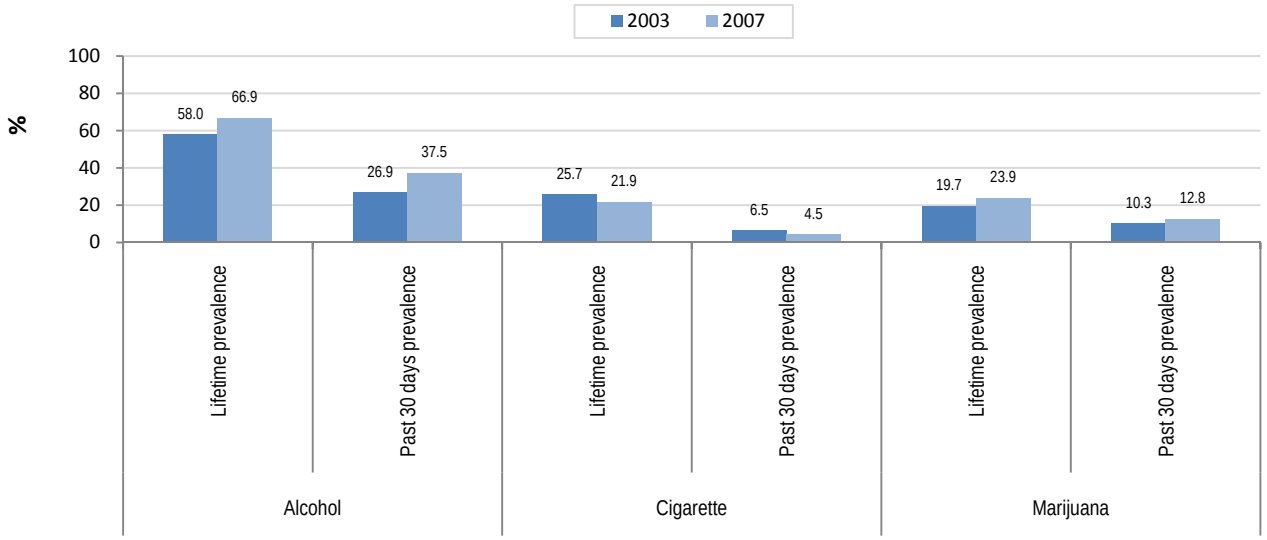
Personal Wellness Report: Teen Edition (2001, 2006) - measured how many days within the past month middle and high school students smoked or drank alcohol.

Due to low participation of public high school students in the Personal Wellness Report (2006), caution is advised against drawing valid or broad conclusions regarding generalisation to the full population of Bermuda's adolescents.

Comparisons to the OECD data are not made because measurements of smoking and alcohol consumption among students vary considerably. The OECD indicator for smoking refers to the percentage of 15-year-old children who self-report smoking at least once a week. Drunkenness was measured by the percentage of 15-year-old children saying they had been drunk two or more times in their lives.

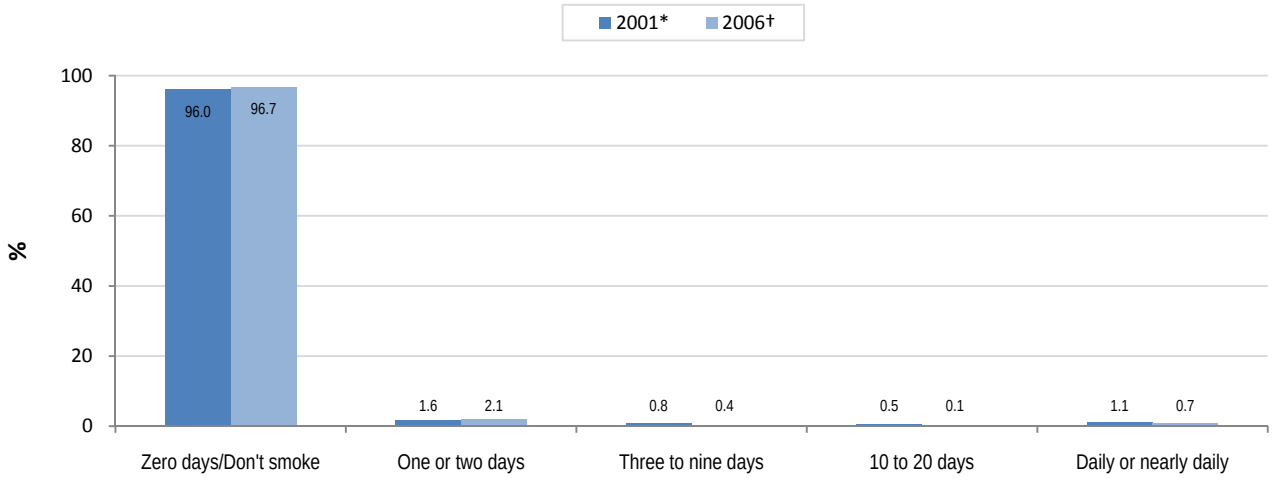
(OECD, 2009, p44)

2.1.1 Alcohol, cigarette and marijuana consumption by adolescents, 2003 & 2007 (BDA)



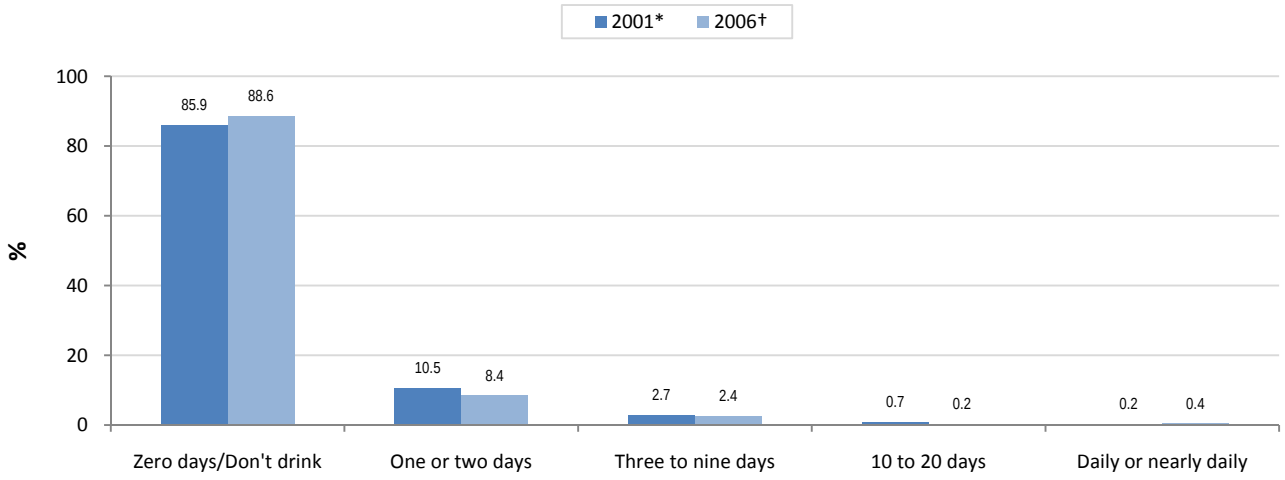
SOURCE: Communities that Care Youth Survey (M2-S4 school children)

2.1.2 Smoking among middle and high school students, 2001 & 2006 (BDA)



*SOURCE: *Department of Health, Personal Wellness Report: Teen Edition, 2001. †Argus Group, Personal Wellness Report: Teen Edition, 2006.* **NOTE:** Participation in 2006 study was too low to draw valid or broad conclusions regarding the health status of Bermuda's teenagers.

2.1.3 Alcohol consumption among middle and high school students, 2001 & 2006 (BDA)



*SOURCE: *Department of Health, Personal Wellness Report: Teen Edition, 2001. †Argus Group, Personal Wellness Report: Teen Edition, 2006.* **NOTE:** Participation in 2006 study was too low to draw valid or broad conclusions regarding the health status of Bermuda's teenagers.

2.2 Nutrition and physical activity among adolescents

Good nutrition is vital to health and necessary for healthy growth and development in children and adolescents.[35] Diets high in fruits and vegetables are associated with a reduced incidence of cancer and cardiovascular disease.[36] The adoption of healthy eating and physical activity behaviours at a young age contributes to better mental, social, and physical health for young people. It also sets the foundation for better health throughout one's life span and, therefore, influences a longer and better quality of life.[37]

There were slight increases in the proportion of adolescent respondents eating fruits and vegetables from 2001 to 2006 (Figure 2.2.1); fewer persons reported that they consumed no fruits and vegetables per day and more persons reported consumption of five or more fruits and vegetables per day. Bermuda's adolescents are more likely to eat five or more fruits and vegetables per day than their American counterparts (over 30% vs. 20-24%).[38]

Physical activity on a regular basis provides substantial physical, mental, and social health benefits to people of all ages. Patterns of physical activity attained as a young person are more likely to be maintained throughout the person's life time.[39]

The proportion of Bermuda's adolescent respondents reporting physical activity also increased from 2001 to 2006 (Figure 2.2.2) with less persons reporting no days of physical activity and more persons reporting physical activity on four or more days per week.

Definition and deviations

There have been two surveys (in 2001 and in 2006) conducted among Bermuda's middle and high school age children which look at nutrition and physical activity.

In the Personal Wellness Report: Teen Edition (2001, 2006) – nutrition was measured in terms of self-reported consumption of daily fruits and vegetables servings by middle and high school students.

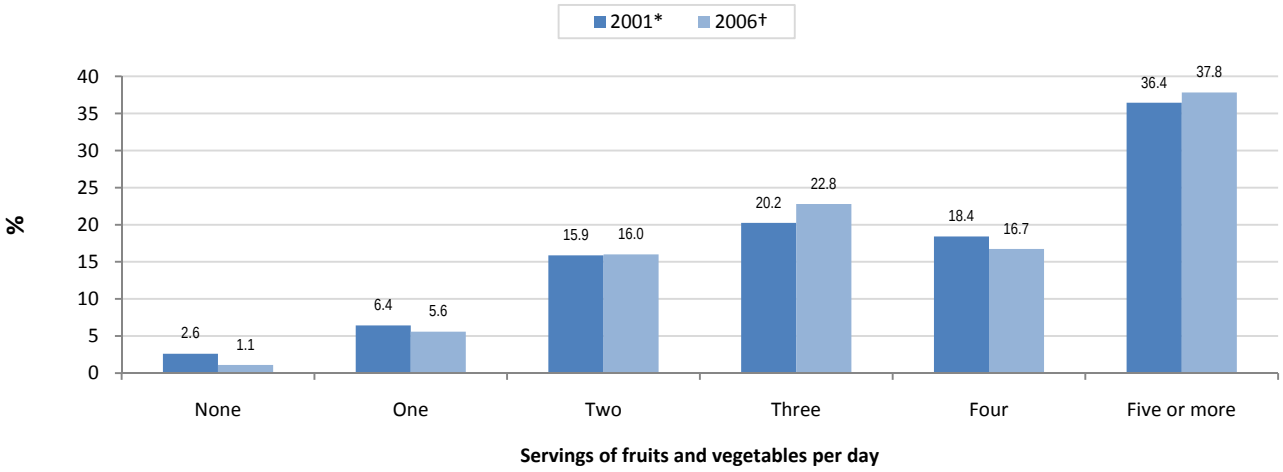
The Personal Wellness Report: Teen Edition (2001, 2006) also surveyed middle and high school students for the number of days per week they exercise or play sports (outside of PE) for at least 30 minutes (only including activities that produced sweat and hard breathing).

Comparisons to the OECD data are not made due to considerably different measurements. Data for 25 OECD countries came from the Health Behaviour in School-aged Children (HBSC) surveys conducted in 2001-02 and 2005-06. Although a nutritious diet includes numerous types of foods, the OECD indicator for nutrition was measured in terms of the "proportion of children who report eating fruit at least every day or more than once a day" (OECD, 2009, p46).

Physical activity was measured by self-reported regularity of moderate-to-vigorous physical activity by 11-, 13-, and 15-year-olds in 2001/02 and 2005/06. In this instance, moderate-to-vigorous physical activity is defined as an hour or more of exercise that increases the heart and breathing rates (and at times leaves the child breathless) at least five days per week in 2001/02 and every day in 2005/06 (OECD, 2009, p48).

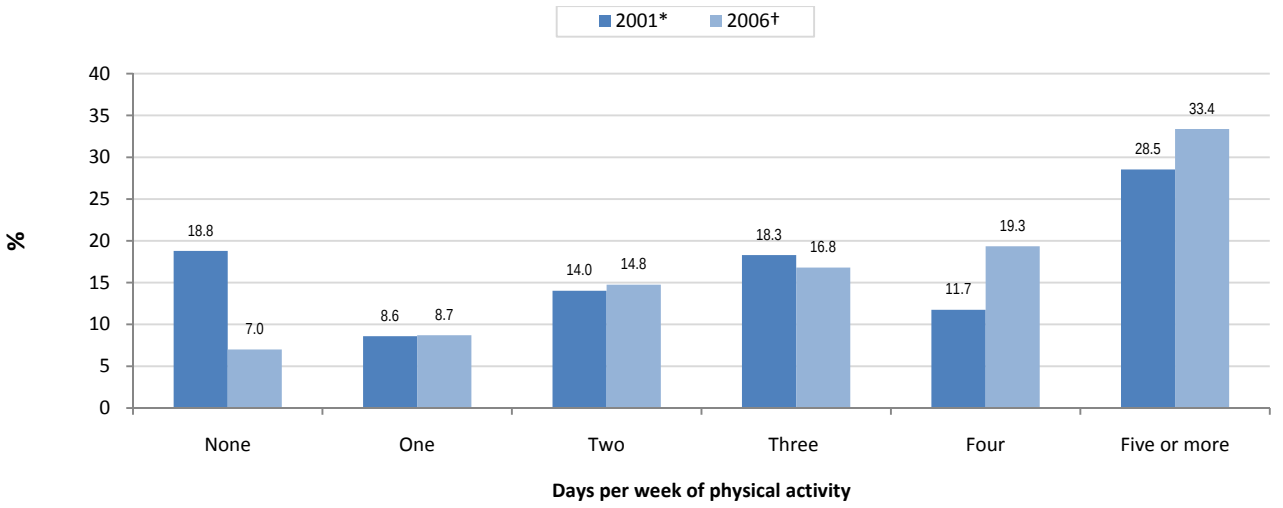
Adolescents aged 11-18 were surveyed in the Bermuda Personal Wellness Reports. Due to low participation of public high school students in the 2006 Personal Wellness Report the results and comparisons must be treated with caution, as the sample excludes an important proportion of the adolescent population. The 2006 results are not representative of the general population of Bermuda's adolescents.

2.2.1 Daily servings of fruits and vegetables among middle and high school students, 2001 & 2006 (BDA)



*SOURCE: *Department of Health, Personal Wellness Report: Teen Edition, 2001. †Argus Group, Personal Wellness Report: Teen Edition, 2006.* **NOTE:** Participation in 2006 study was too low to draw valid or broad conclusions regarding the health status of Bermuda's teenagers.

2.2.2 Days of physical activity per week among middle and high school students, 2001 & 2006 (BDA)



*SOURCE: *Department of Health, Personal Wellness Report: Teen Edition, 2001. †Argus Group, Personal Wellness Report: Teen Edition, 2006.* **NOTE:** Participation in 2006 study was too low to draw valid or broad conclusions regarding the health status of Bermuda's teenagers.

2.3 Overweight and obesity among adolescents

Overweight and obesity in childhood and adolescence has both immediate and long-term health impacts. Obese youth are more likely to develop type 2 diabetes and other risk factors for cardiovascular disease, such as high cholesterol or high blood pressure. Children and adolescents who are obese are at greater risk for bone and joint problems, sleep apnoea, and social and psychological problems such as stigmatisation and poor self-esteem. And finally, obese youth are more likely than youth of normal weight to become overweight or obese adults and, therefore, more at risk for associated adult health problems including heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis.[40] Physical inactivity and unhealthy eating contribute to obesity. Alternatively, the appropriate amount, intensity and duration of regular physical activity, and improved dietary choices to reduce calorie intake can reduce a person's body mass.

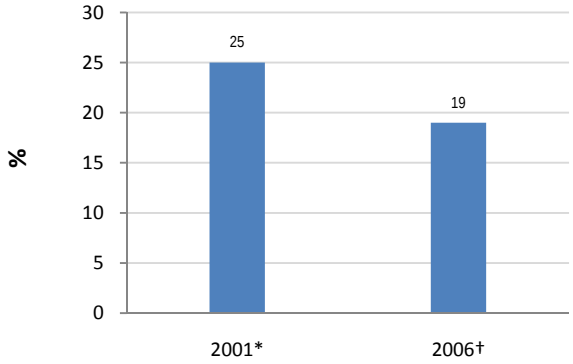
The proportion of overweight adolescents in Bermuda appears to have decreased between 2001 and 2006, but due to the participation rates in the 2006 survey it would be amiss to make this conclusion (Figure 2.3.1). Taking into account the limitations of the 2006 survey, Bermuda's adolescent overweight and obesity rate remains higher than most OECD countries and is just below the rate in Canada (Figure 2.3.2). The rate in the United States is the highest of all the countries presented. Lifestyles in Bermuda, especially in terms of physical activity and diet, tend to most closely resemble those in the United States and Canada, so it is not surprising that Bermuda rates are similar to theirs.

Definition and deviations

Estimates on overweight and obesity are based on Body Mass Index (BMI) calculations using self-reported height and weight measurements. Overweight and obese children are those whose BMI is above a set of age- and sex-specific cut-off points. Indicators for OECD countries were drawn from the Health Behaviour in School-aged Children Surveys conducted in 2001/02 and 2005/06 (OECD, 2009, p50).

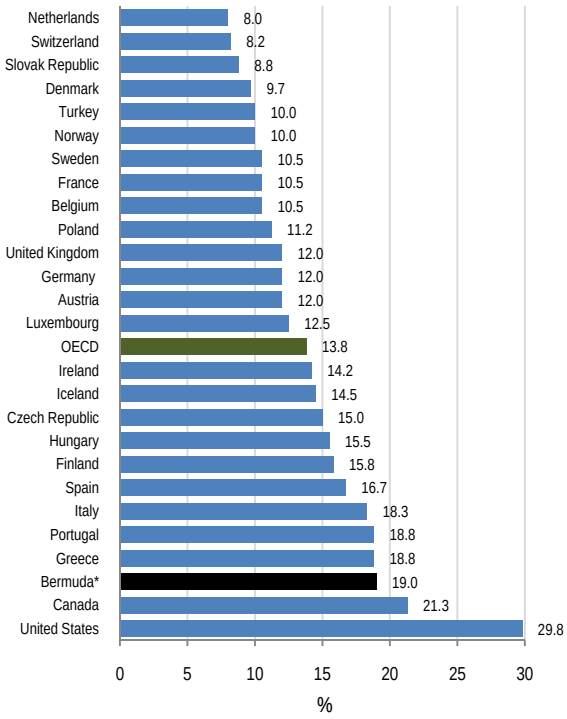
Indicators for Bermuda were drawn from both the *Personal Wellness Report: Teen Edition* 2001 and the 2006 edition, which surveyed children aged 11-18 years. Self-reported height and weight should be interpreted with caution due to under-reporting and error. In addition, due to low participation of public high school students in the Personal Wellness Report (2006), the results and comparisons must be treated with caution, as the sample excludes an important proportion of the adolescent population. The 2006 results are not representative of the general population of Bermuda's adolescents.

2.3.1 Percentage of middle and high school students overweight, 2001 & 2006 (BDA)



*SOURCE: *Department of Health, Personal Wellness Report: Teen Edition, 2001. †Argus Group, Personal Wellness Report: Teen Edition, 2006.* **NOTE**: Participation in 2006 study was too low to draw valid or broad conclusions regarding the health status of Bermuda's teenagers.

2.3.2 Children aged 11-15 years who are overweight or obese, 2005-06



*Children ranged from age 11-18 years

SOURCE: OECD Health Data 2009

2.4 Tobacco consumption among adults

The consumption of tobacco in any form is addictive and deadly. There is irrefutable evidence showing that smokers have a significantly higher chance of dying from various cancers (predominantly lung cancer), stroke, heart and respiratory diseases, and many other grave conditions. Smoking and exposure to second-hand smoke significantly increases health risks for pregnant women, infants, and children.[41] Cessation of smoking by current smokers reduces their risk of heart disease, cancer, stroke, and respiratory disease. As tobacco consumption is a leading contributor to deaths, reductions in smoking should lead to reductions in mortality from associated conditions.

Figures 2.4.1 and 2.4.2 show a slight decrease in smoking habits among Bermuda's adults. In 2006 more people had never smoked than in 1999 and declines were observed in the percentage of persons identifying themselves as current smokers from 1999 to 2006, with a further decline in 2008. Part of this may be due to the Tobacco Products (Public Health) Amendment Act 2005 which came into operation in 2006. The law prohibits smoking in certain places, such as enclosed public spaces, workplaces, restaurants, hotels, hospitals, etc.

Figures 2.4.3 and 2.4.4 show cigarette smoking habits by adults, overall and by gender. Males are more likely to smoke, with almost half of all males reporting having ever smoked compared to less than a third of all females. Males are also more likely to be a current smoker.

The proportion of daily smokers in Bermuda is lower than the proportion in all OECD countries (Figure 2.4.5). By gender, the rates are also well below the OECD averages for males and females (Figure 2.4.6). Bermuda has the same general pattern of gender differences as most of the OECD countries, with smoking rates higher among males than females.

Definition and deviations

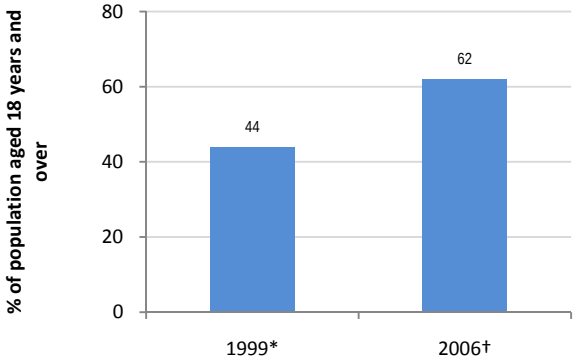
A number of surveys have examined smoking in adults in Bermuda. The main one, the *Health Survey of Adults and Children in Bermuda (2006),* defined smoking as having smoked at least 100 cigarettes during a lifetime and current smoking as smoking some days or everyday during the past 30 days. Adults were considered to be 18 years and older.

The proportion of daily smokers is defined by the OECD as the percentage of the population aged 15 years and over reporting smoking every day.

Caution is advised when comparing countries due to the lack of standardisation in how smoking habits were measured. The health interview surveys varied in the wording of questions, response categories, and survey methodologies. For example, several countries' surveys asked respondents if they smoke regularly, rather than daily. The OECD data considers an adult to be 15 years and older, while Bermuda surveyed persons aged 18 years and older.

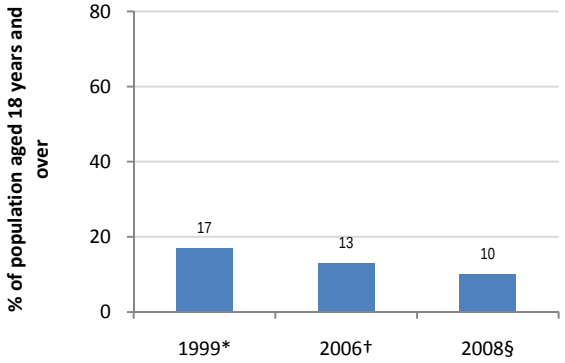
(OECD, 2009, p52)

2.4.1 **Proportion of adults who have never smoked, 1999 and 2006** (BDA)



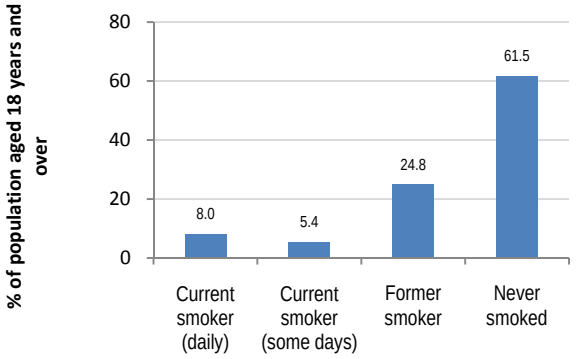
*SOURCE:*The Adult Wellness Report 1999. † Health Survey of Adults and Children in Bermuda 2006.*

2.4.2 **Current smokers, 1999, 2006 and 2008** (BDA)



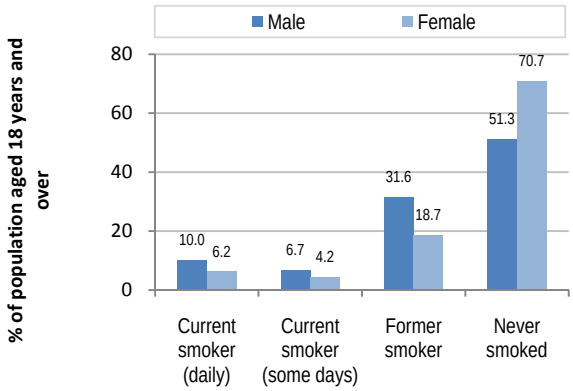
*SOURCE:*The Adult Wellness Report 1999. † Health Survey of Adults and Children in Bermuda 2006. § The Bermuda Omnibus Survey Q1 2008.*

2.4.3 **Cigarette smoking by adults, 2006** (BDA)



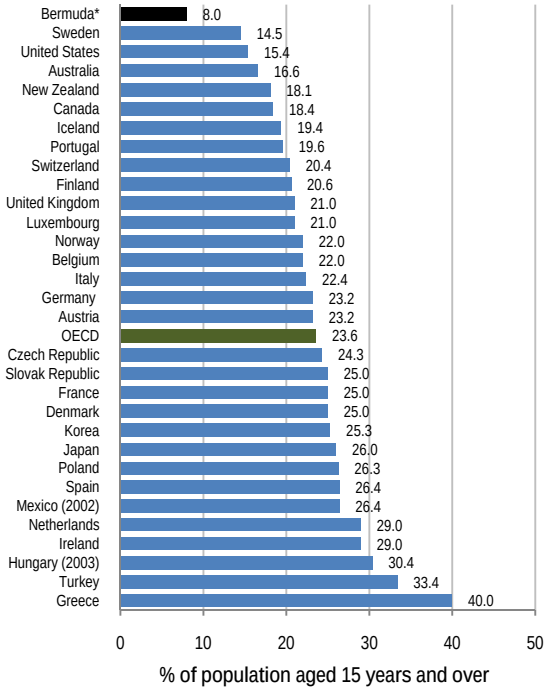
SOURCE: Health Survey of Adults & Children in Bermuda 2006

2.4.4 **Cigarette smoking by adults, by gender, 2006** (BDA)



SOURCE: Health Survey of Adults & Children in Bermuda 2006

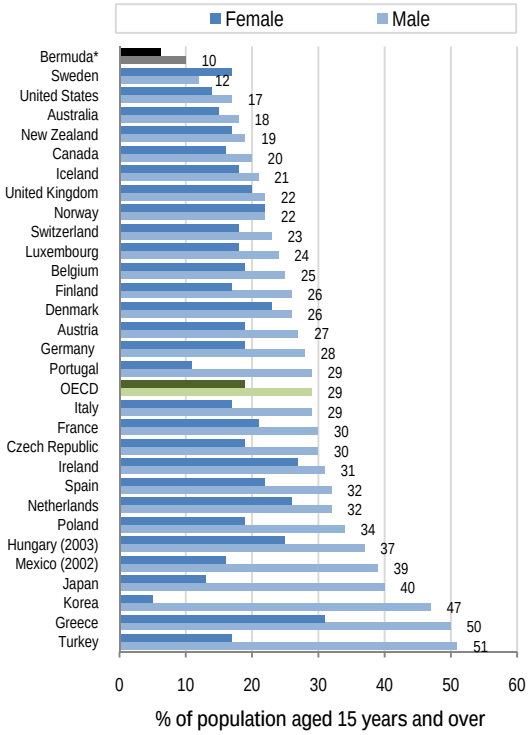
2.4.5 Percentage of adult population smoking daily, 2007 (or latest year available)



* Adult population is 18 years and older

SOURCE: OECD Health Data 2009

2.4.6 Percentage of males and females smoking daily, 2007 (or latest year available)



* Adult population is 18 years and older

SOURCE: OECD Health Data 2009

2.5 Alcohol consumption among adults

Excessive alcohol consumption in the form of heavy drinking and/or binge drinking can result in immediate and long-term harmful effects on one's health. Immediate effects can include violence, risky sexual behaviour, physical and cognitive birth defects due to maternal alcohol use during pregnancy, alcohol poisoning, and unintentional injuries such as motor vehicle crashes, drowning, and falls. After a period of time, excessive alcohol consumption can lead to chronic diseases such as hypertension and other heart diseases, liver diseases, and cancers, particularly of the digestive organs. Additional effects of excessive and prolonged alcohol consumption include neurological impairments such as stroke and dementia, psychiatric issues including depression and suicide, and social issues including family problems and loss of productivity.[42]

The estimates of household expenditure on alcoholic drinks decreased steadily from 2005 to 2008, (Figure 2.5.1). Survey results also indicate that the proportion of adults consuming alcohol and the proportion of adults engaging in binge drinking (defined as five or more drinks on at least one occasion) has decreased (Figure 2.5.2).

By gender, more women are reporting abstinence from alcoholic beverages, while more men report binge drinking (Figure 2.5.3). Overall, compared to the United States, Bermuda's rate of abstinence from alcohol is slightly higher (46.8% vs. 44.8%) but the rate of binge drinking is much higher (23.6% vs. 15.4%).[43,44]

There were also differences in alcohol use by income (Figure 2.5.4). Persons with lower income were more likely to abstain from drinking while persons with high income were more likely to have three or more drinks per occasion. There were no significant differences by income for persons having one or two drinks per occasion or five or more drinks per occasion.

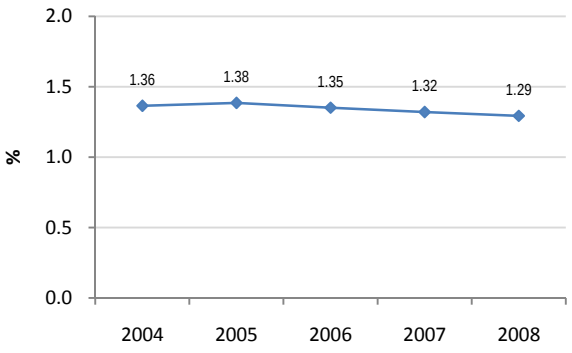
Definition and deviations

Alcohol consumption among adults is measured in two ways. The first measure is by estimates on household consumption/expenditure of alcoholic drinks (dollars). Secondly, two surveys have been conducted among Bermuda's adults. *The Adult Wellness Survey* (2001) and *The Health Survey and Adults and Children in Bermuda* (2006) both measured alcohol consumption by asking about the consumption of alcohol within the previous month.

Comparisons to the OECD data are not made due to considerably different measurements. The OECD indicator for alcohol consumption is measured by the annual sales of pure alcohol in litres per person aged 15 years and over. It is likely that the methodology used to convert alcohol drinks to pure alcohol varied across countries.

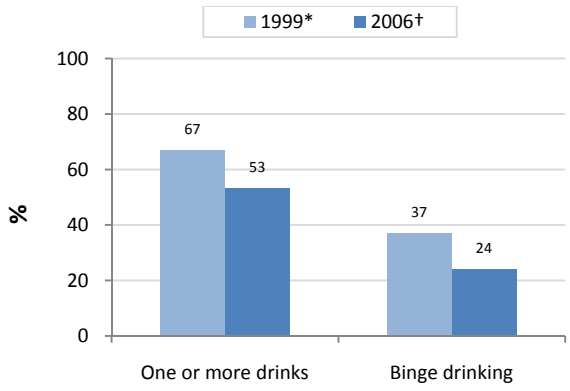
(OECD, 2009, p54)

2.5.1 Estimates on household consumption of alcoholic drinks as a share of total household consumption (BDA)



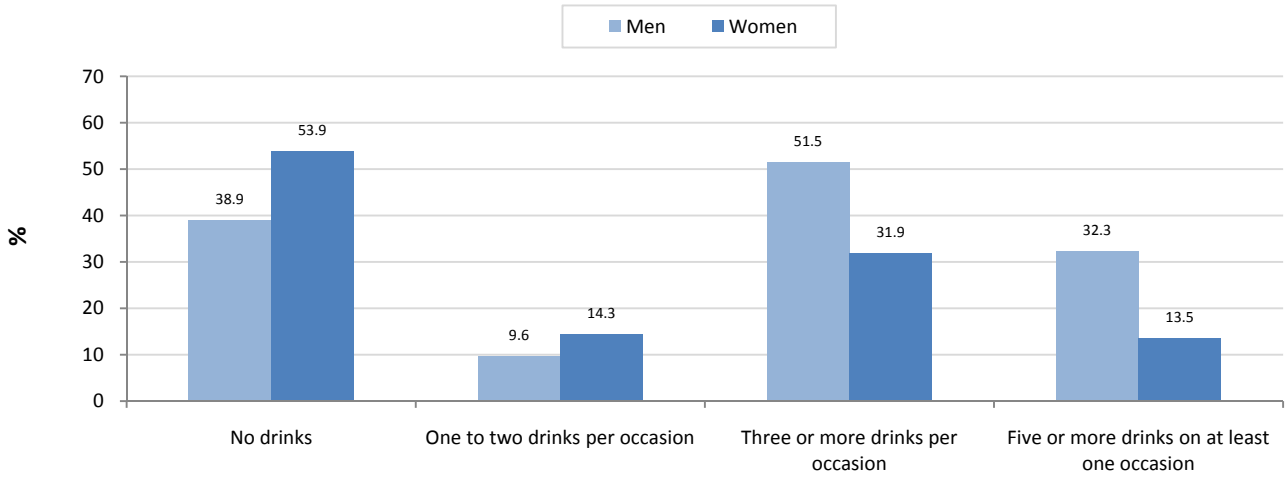
SOURCE: Department of Statistics, Government of Bermuda

2.5.2 Alcohol consumption in previous 30 days, 1999 and 2006 (BDA)



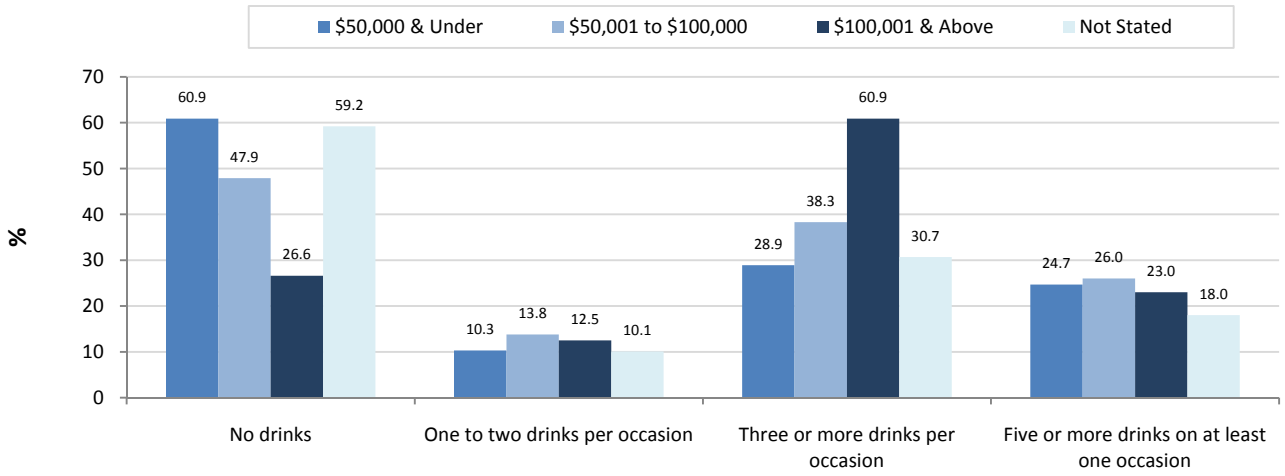
*SOURCE:*The Adult Wellness Report 1999. † Health Survey of Adults and Children in Bermuda 2006.*

2.5.3 Adult alcohol consumption in previous 30 days, by gender, 2006 (BDA)



Source: Health Survey of Adults and Children in Bermuda 2006.

2.5.4 Adult alcohol consumption in previous 30 days, by income, 2006 (BDA)



Source: Health Survey of Adults and Children in Bermuda 2006.

2.6 Overweight and obesity among adults

Overweight and obesity are known risk factors for certain chronic diseases and other health problems. Studies have shown that as weight increases to levels of overweight and obesity, there is also an increase in conditions such as coronary heart disease, type 2 diabetes, cancers, hypertension, stroke, liver and gallbladder disease, sleep apnoea and other respiratory problems, osteoarthritis, and gynaecological problems.[45]

While the proportion of overweight or obese adults increased in recent years in Bermuda (Figure 2.6.1), the proportion of obese adults decreased (Figure 2.6.2). The year 2006 saw a reversal in the gender distribution of obesity with more females assessed as obese than males; however, males were more likely to be overweight (Figure 2.6.3). Cultural, behavioural, and environmental factors have contributed to Bermuda having such high overweight and obesity rates. There is ready availability of high-calorie but nutrient-poor foods, low levels of activity and a culture which supports and accepts lifestyle behaviours that promote weight gain and maintenance of overweight. This results in Bermuda comparing very unfavourably with OECD countries. Indeed, Bermuda has among the highest obesity rates, regardless of gender of all OECD countries (Figures 2.6.4 and 2.6.5).

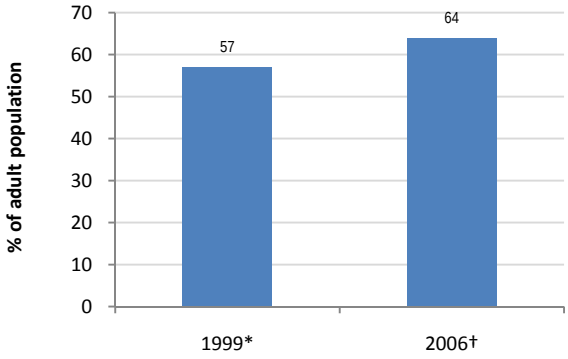
Definition and deviations

Overweight and obesity are defined as excess weight presenting health risks because of the high proportion of body fat. The most frequently used measure is based on the Body Mass Index (BMI), which is a single number that evaluates an individual's weight in relation to height. Based on the WHO classification, adults with a BMI between 25 and 30 are defined as overweight and those with a BMI over 30 as obese.

Most countries obtain overweight and obesity rates through population-based health interview surveys using self-reported estimates of height and weight. Several countries, however, utilised health examinations in order to determine overweight and obesity rates. These included Australia, Czech Republic (2005), Japan, Luxembourg, New Zealand, the Slovak Republic (2007), the United Kingdom and the United States. Health examination estimates are typically higher and more reliable than health interviews. Given the varying methods of data collection, comparisons between countries are limited.

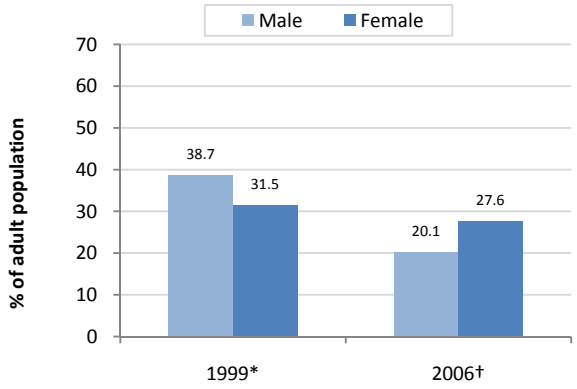
(OECD, 2009, p56)

2.6.1 Overweight and obesity rates among adults, 1999 and 2006 (BDA)



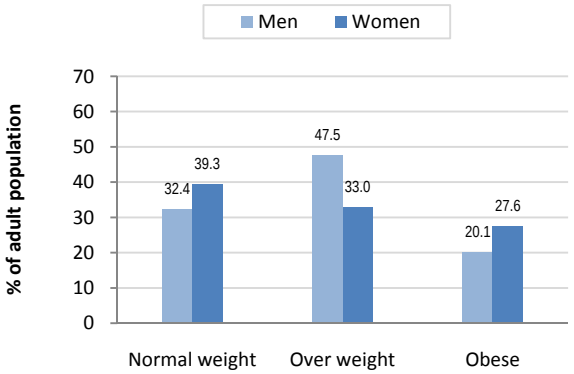
*SOURCE:*The Adult Wellness Report 1999. † Health Survey of Adults and Children in Bermuda 2006.*

2.6.2 Obesity rates among adults, by gender, 1999 and 2006 (BDA)



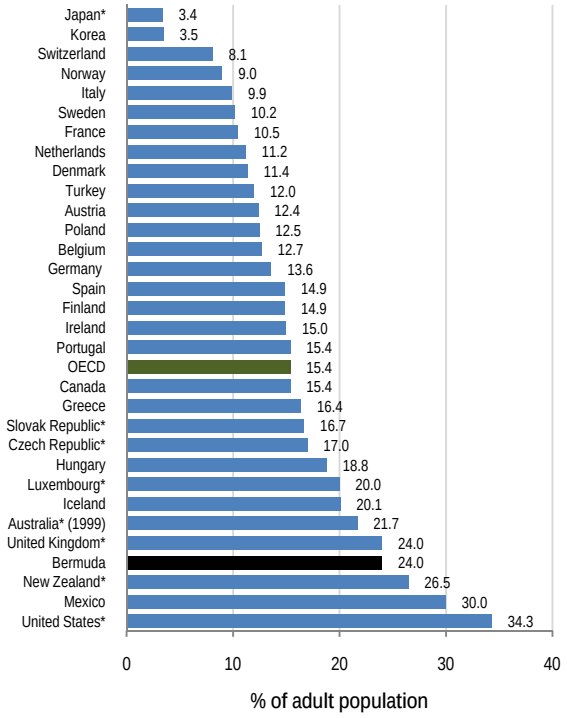
*SOURCE:*The Adult Wellness Report 1999. † Health Survey of Adults and Children in Bermuda 2006.*

2.6.3 Body Mass Index for adults, by gender, 2006 (BDA)

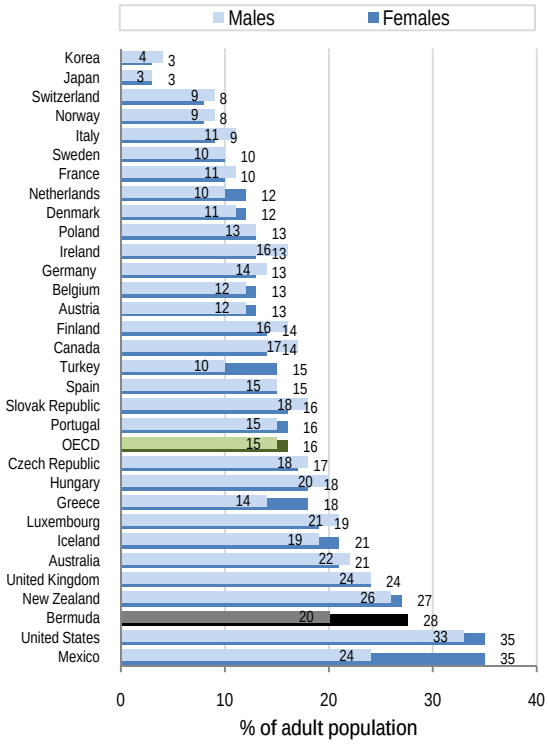


SOURCE: Health Survey of Adults & Children in Bermuda (2006)

2.6.4 Obesity rates among adults, 2007 (or latest year available)



2.6.5 Obesity rates among adults, by gender, 2007 (or latest year available)



* Australia, Czech Republic (2005), Japan, Luxembourg, New Zealand, Slovak Republic (2007), United Kingdom and United States figures are based on health examination surveys, rather than health interview surveys.

SOURCE: OECD Health Data 2009

SOURCE: OECD Health Data 2009

3. HEALTH WORKFORCE

3.1 Employment in the health and social sectors

The foundation of a health system is its health workers. A health system's performance, with regards to access and quality, greatly depends on the size, make-up, distribution, and efficiency of its health labour force.[46] The World Health Report 2006 suggests that "countries with fewer than 23 physicians, nurses, and midwives per 10,000 population face more challenges in achieving adequate coverage rates for selected primary healthcare interventions as prioritised by the Millennium Development Goals' framework".[47] However, Bermuda's small size and dense population places the Island in a position different from countries with large rural areas to cover, which require more health personnel.

Reliable historical data on the number of health professionals practicing locally is not readily available. The Annual Employment Survey has been reported to underestimate the number of practicing health workers and the registers of professionals include everyone licensed, rather than those currently practicing (e.g. the registers include licensed professionals living abroad).

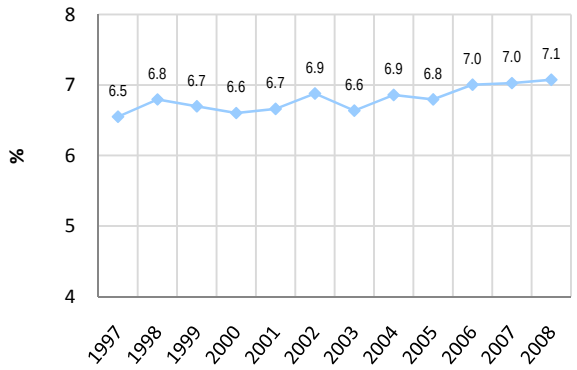
Notwithstanding these challenges, available data indicates that employment in the healthcare sector appears to have grown steadily in Bermuda although it has not yet reached the OECD average (Figure 3.1.1 and 3.1.2). This is likely related to Bermuda's small size and population in comparison with the OECD countries. Bermuda is also geographically isolated, with the nearest point of land being the United States approximately 600 miles away. There are no local graduate programmes in health sectors, and, as such, all health professionals are trained abroad (e.g. physicians, dentists, nurses, pharmacists). Additionally, many health professionals must be recruited from abroad in order to meet the healthcare needs of Bermuda's residents.

Definition and deviations

Employment in the health and social sectors focuses on people who fall under the following categories of the International Standard Industrial Classification (ISIC) Rev 3: 851 - Human health activities, 852 - Veterinary activities, and 853 - Social work activities (includes child care, long-term care and other types of social work). Data for this area not only includes health professionals that work directly with people, but also those who provide administrative and other support. The figures are based on head counts and include full-time and part-time workers. In order to obtain greater compatibility across countries data are taken from Labour Force Surveys.

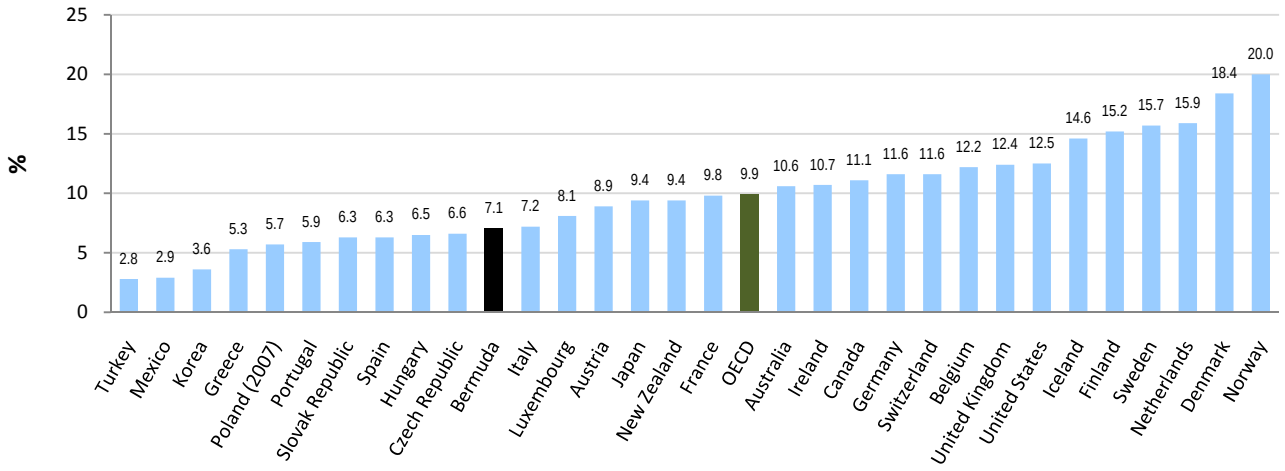
(OECD, 2009)

3.1.1 Employment in the health and social sectors as a share of total civilian employment (BDA)



SOURCE: Department of Statistic, Government of Bermuda

3.1.2 Employment in the health and social sectors as a share of total civilian employment, 2008 (or nearest year available)



SOURCE: Health at a Glance 2009: OECD Indicators

3.2 Practicing physicians

Practising physicians provide services directly to patients. Tasks of the practicing physician include: conducting medical examinations, making diagnoses, prescribing medication; giving treatment for diagnosed illnesses, disorders or injuries; giving specialised medical or surgical treatment for particular types of illnesses, disorders or injuries; and giving advice on and applying preventive medicine methods and treatments. This indicator is important in describing the availability of medical care for the population.

As is the case across most health professions, precise historical data on the number of physicians practicing in Bermuda is not readily available. Nevertheless, the data presented provides the best available proxy.

The number of practicing physicians per 1,000 population has increased over the period under review (Figure 3.2.1). This is due to the increased return of Bermudian physicians and to the implementation of the hospitalist programme in Bermuda's sole, acute care hospital. Although the ratio is much lower than the OECD average, the majority of the population report at least one annual consultation with a physician (see Indicator 4.1 Consultations with doctors) and state that their healthcare needs are met within the current system (see Indicator 6.1 Unmet healthcare needs).

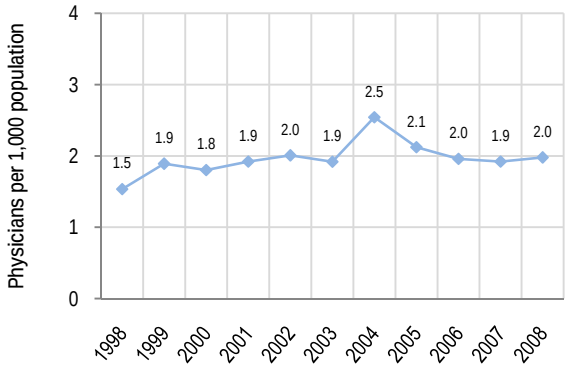
Definition and deviations

Practising physicians are described as the number of doctors who provide direct care to patients. Several countries include interns and residents (doctors in training) in their count.

All but Norway presented data based on head counts - prior to 2002, Norway reported full-time equivalents. Some countries have provided data that over-estimates the number of practicing physicians. For example, data presented by Ireland, the Netherlands, New Zealand and Portugal report the number of physicians entitled to practice. Spain included dentists and stomatologists in their count.

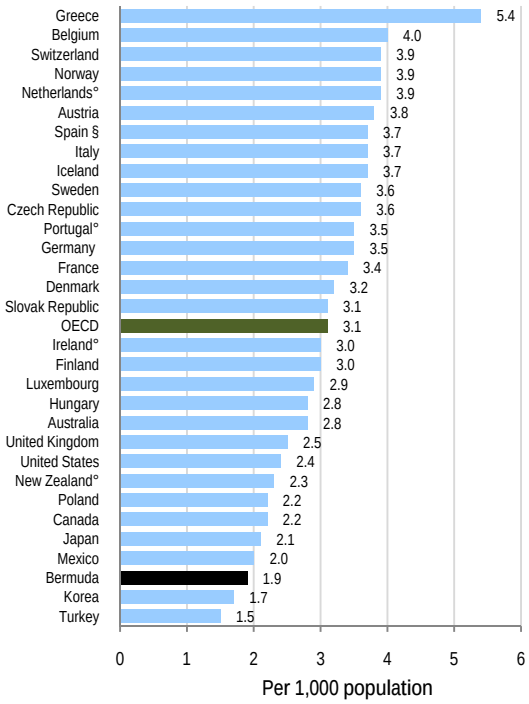
(OECD, 2009)

3.2.1 **Physicians per 1,000 population** (BDA)



*SOURCE: *Annual Employment Survey (Bermuda Digest of Statistics 2009)*

3.2.2 **Practicing physicians per 1,000 population, 2007** (or latest year available)



°Ireland, the Netherlands, New Zealand and Portugal provide the number of all physicians entitled to practice rather than only those practicing.
§Data for Spain include dentist and stomatologists.

SOURCE: OECD Health Data 2009

3.3 Practicing Nurses

Nurses play a central role in delivering healthcare. Their vigilance and cooperation allow doctors to make better diagnoses and propose better treatments. Nurses advocate for health promotion, provide education on the prevention of illness and injury, provide care, assist in cure, participate in rehabilitation, and provide general health support. This indicator is therefore a measure of accessibility, availability, and efficiency of healthcare services. Time trends may help to identify staff shortages and direct action.

As is the case for most health professions, precise historical data on the number of nurses practicing in Bermuda is not readily available. The data presented provides the best-available proxy.

The number of nurses per 1,000 population (nurse density) has remained relatively stable in Bermuda despite showing a negative annual growth rate, unlike most of the OECD countries (Figures 3.3.1 and 3.3.3). Any decline in the number of nurses could be problematic and should prompt efforts toward the training, recruitment, and retention of nursing personnel in Bermuda. Already, nurse density is lower than the OECD average, although the ratio of practicing nurses to practicing physicians is on par with the OECD average (Figures 3.3.2 and 3.3.4).

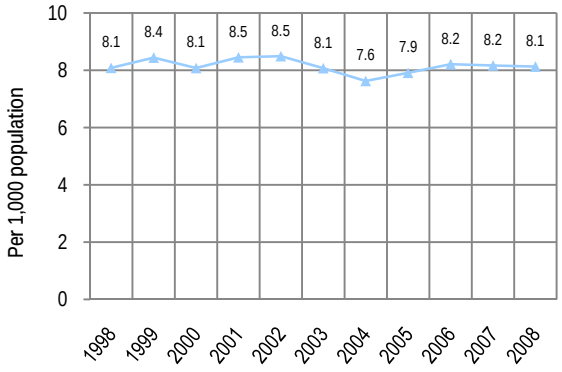
Definition and deviations

Practicing nurses include nurses employed in all public and private settings, including self-employed, who are providing services directly to patients. In most countries, the data include both "professional nurses" who have a higher level of education and perform higher level tasks and "associate professional nurses" who have a lower level of education, but are nonetheless recognised and registered as nurses. Midwives, nursing aids that are not recognised as nurses, and nurses working in administration and research should normally be excluded.

About half of OECD countries include midwives because they are considered as a specialist nurse and a number of countries include non-practising nurses working in administration and research (resulting in an over-estimation). Austria reports only nurses working in hospitals, resulting in an underestimation. Data for Germany does not include about 250,000 nurses (representing an additional 30% of nurses) who have three years of education and are providing services for the elderly.

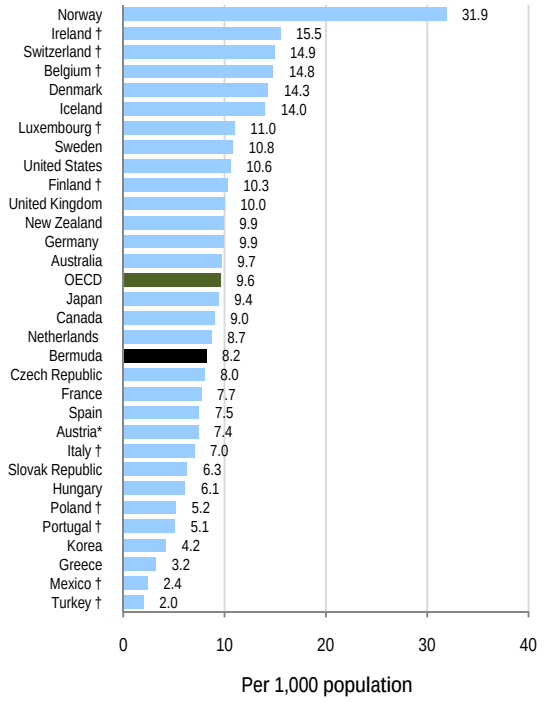
(OECD, 2009, p76)

3.3.1 Nurses per 1,000 population (BDA)



SOURCE: Annual Employment Survey (Bermuda Digest of Statistics 2009)

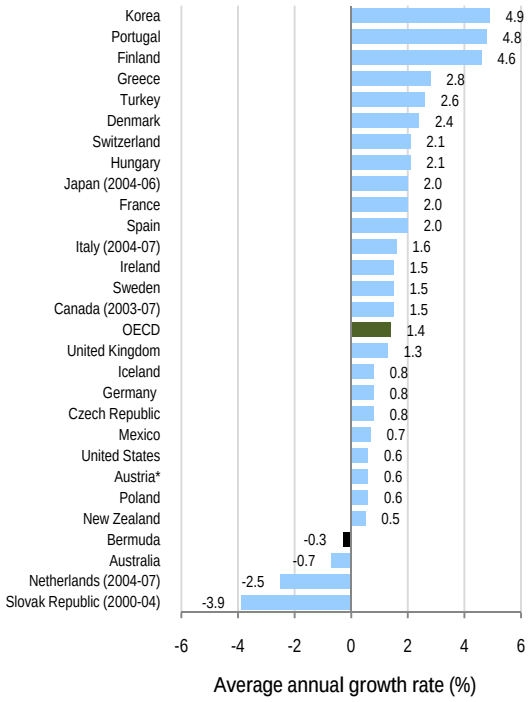
3.3.2 Practicing nurses per 1,000 population, 2007 (or latest year available)



*Austria reports only nurses employed in hospitals. †Includes both associate and professional nurses.

SOURCE: OECD Health Data 2009

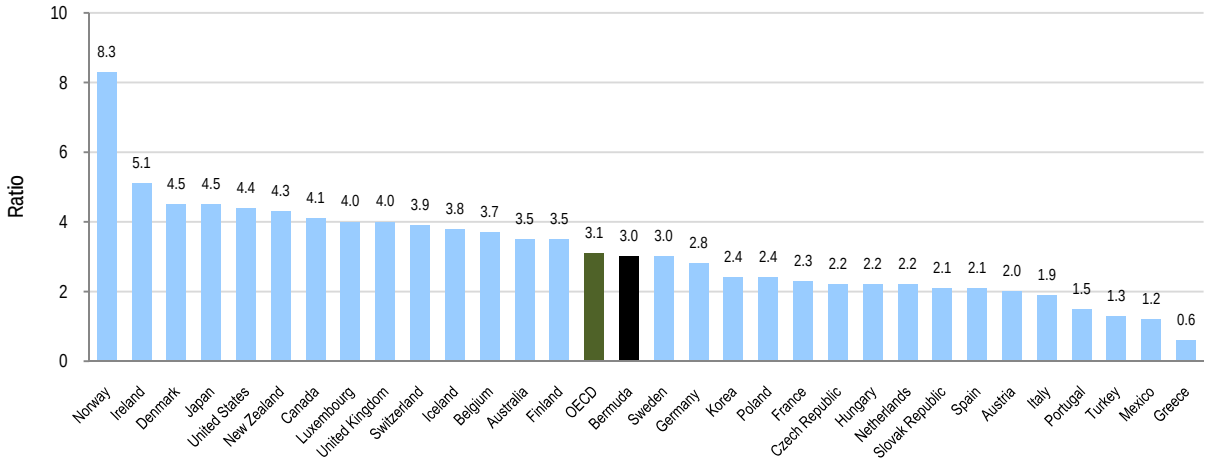
3.3.3 Change in the number of practicing nurses per 1,000 population, 2000-07 (or latest year available)



*Austria reports only nurses employed in hospitals. †Includes both associate and professional nurses.

SOURCE: OECD Health Data 2009

3.3.4 Ratio of practising nurses to practicing physicians, 2007 (or latest year available)



SOURCE: OECD Health Data 2009

3.4 Dentists

The number of dentists is useful in assessing the accessibility of oral health services. Although some dental care services are provided by dental hygienists and dental assistants, the number of dentists is an appropriate indicator in describing the availability of dental care for a given population.

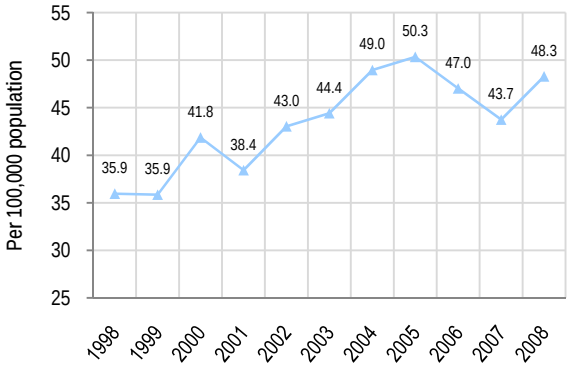
While the number of dentists has generally increased over the years, the rate per 100,000 population is well below the OECD average and similar to the rate in United Kingdom (Figures 3.4.1, 3.4.2 and 3.4.3). This implied "shortage" of dentists does not reflect in the dental health status of the population, as measured by the DMFT index at age 12 (see Indicator 1.16 Dental health among children). Demand for dental care is high in Bermuda with most dentists employing support staff, including dental hygienists and dental assistants, which allows care to be provided for more patients per day and per dentists than would otherwise be possible.

Definition and deviations

The number of dentists includes both salaried and self-employed dentists. In most countries, the data only include dentists providing direct services to clients/patients. However, this is not the case in Canada, Ireland, Portugal, and Spain where the data relate to all dentists licensed to practice, including those who may not be actively practising.

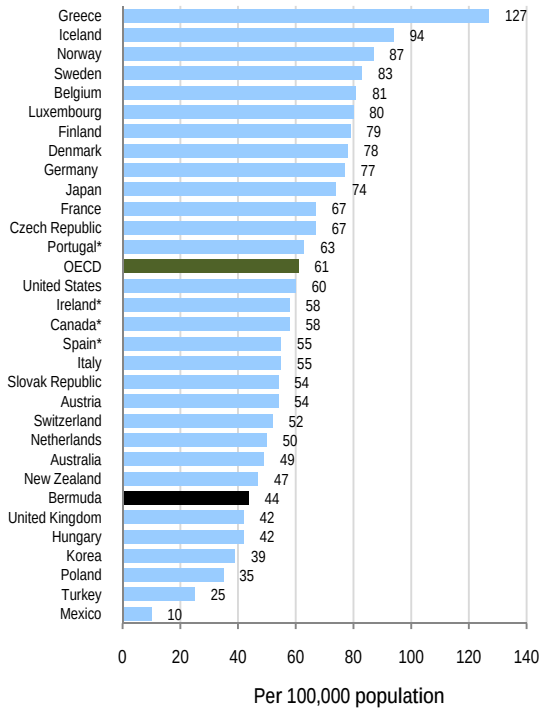
(OECD, 2009, p82)

3.4.1 **Dentists per 100,000 population** (BDA)



SOURCE: Annual Employment Survey (Bermuda Digest of Statistics 2009)

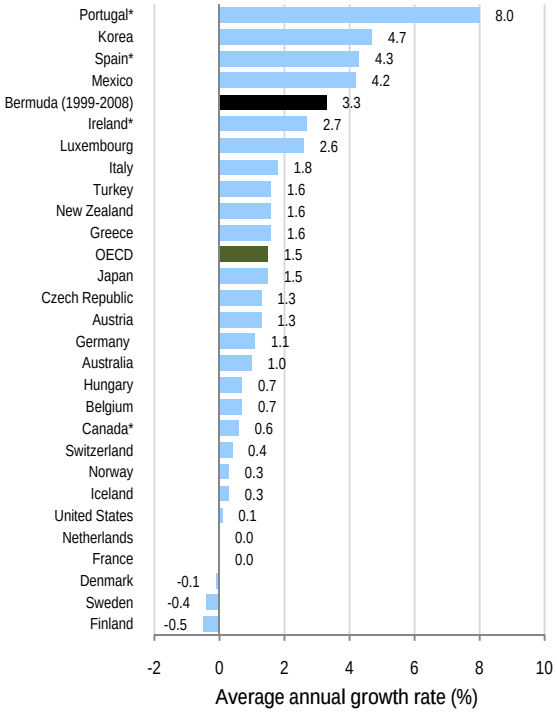
3.4.2 **Dentists per 100,000 population, 2007** (or latest year available)



* Canada, Ireland, Portugal and Spain provide the number of all dentists licensed to practice rather than only those practising.

SOURCE: OECD Health Data 2009

3.4.3 **Change in the number of dentist per 100,000 population, 1990-2007** (or latest year available)



* Canada, Ireland, Portugal and Spain provide the number of all dentists licensed to practice rather than only those practising.

SOURCE: OECD Health Data 2009

3.5 Pharmacists

Recent years have seen a greater reliance on the use of medications to manage medical conditions. Measuring and monitoring the availability of pharmacists is therefore critical in understanding health system resources. Although there is no commonly accepted level of pharmacists per population to ensure that pharmaceutical needs are met, it is generally accepted that low density of any health personnel may suggest inadequate capacity.[48]

Similar to other health professions, precise historical data on the number of pharmacists practicing in Bermuda is not available. The Annual Employment Survey has been reported to underestimate the number of practicing pharmacists and the Register of Pharmacists includes all pharmacists licensed to practice, rather than those currently practicing (e.g. the register includes licensed pharmacists who currently live abroad). The registers for 2009 and 2010 have been updated and provide an accurate reflection of practicing pharmacists on the Island; thus they are the only metrics used in this report.

Figure 3.5.1 shows that the number of practicing pharmacists in Bermuda, 90 per 100,000 population, is above the OECD average of 76. However, the number of pharmacies and other dispensaries of prescribed drugs in Bermuda are slightly below the OECD average (Figure 3.5.2). This finding indicates an adequate capacity of pharmacists to meet population needs. The lower rate of pharmacies must be interpreted in relation to the size of the Island and population density, indicating adequate capacity in dispensaries.

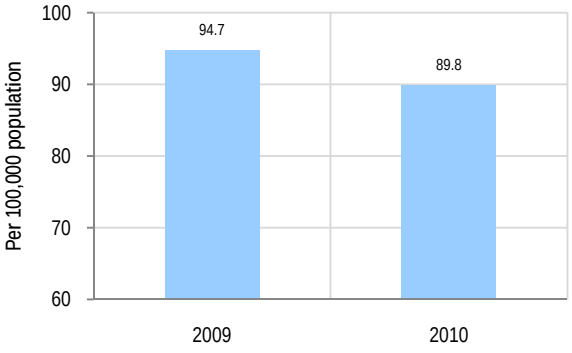
Definition and deviations

Practising pharmacists are defined as the number of pharmacists who are licensed to practice and provide direct services to clients/patients. They can be either salaried or self-employed, and work in community pharmacies, hospitals and other settings. Assistant pharmacists and other employees of pharmacies are normally excluded.

The data from the Netherlands exclude pharmacists working in hospitals/clinics (resulting in a slight under-estimation). The data for Luxembourg exclude pharmacists paid by hospitals, but include employees in pharmacies and pharmacists working in administration. In Ireland, the data include all people on the register of the Pharmaceutical Society of Ireland, possibly including some pharmacists who are not in activity. In addition, the figures include assistant pharmacists, pharmaceutical assistants, and doctors who are dispensing medications (approximately 140 in 2007), resulting in an over-estimation compared with the data provided by other countries. Assistant pharmacists are also included in Iceland.

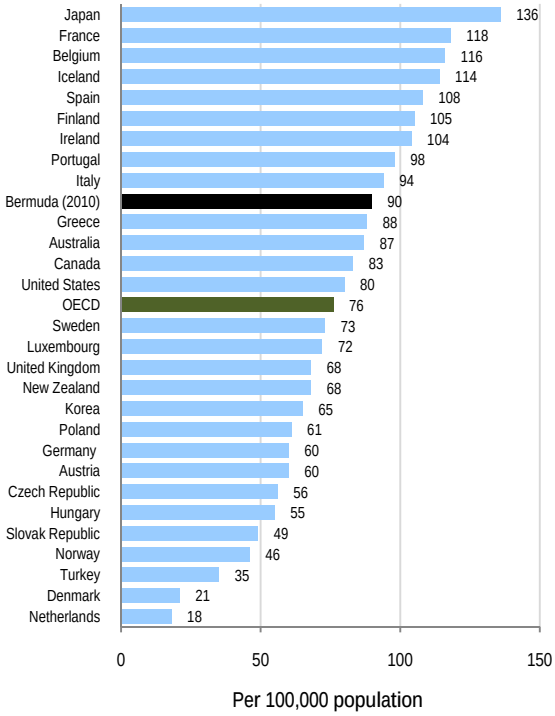
(OECD, 2009, p84)

3.5.1 **Pharmacists per 100,000 population** (BDA)



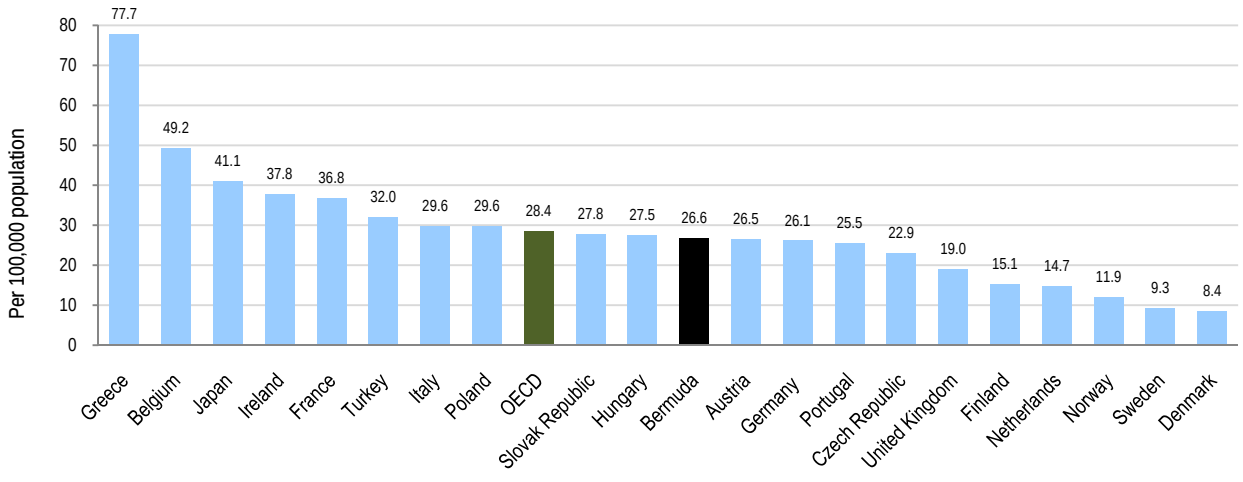
SOURCE: Bermuda Register of Pharmacist

3.5.2 **Pharmacists per 100,000 population, 2007** (or latest year available)



SOURCE: OECD Health Data 2009

3.5.3 **Pharmacies and other dispensaries of prescribed drugs per 100,000 population, 2007**



SOURCE: Health at a Glance 2009

4. HEALTHCARE ACTIVITIES

4.1 Consultations with doctors

Consultations with doctors is a basic indicator for the use of medical services because it provides information that can be used in evaluating access to health services.

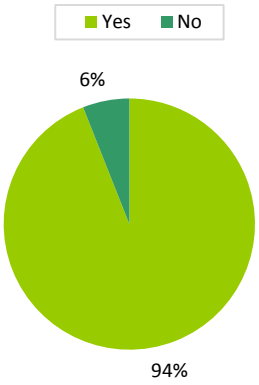
Bermuda has generally high healthcare utilisation in terms of access to family doctors and specialists, with 94% of persons reporting at least one annual visit to a family doctor (Figure 4.1.1) and 57% reporting at least one annual visit to a specialist (Figure 4.1.3). Females were more likely to visit both a family doctor and a specialist (Figures 4.1.2 and 4.1.4), reflecting the generally held perception that females exhibit greater health-seeking behaviour than males. However, with the lack of data on frequency of doctor consultations this inference should be treated with caution.

Definition and deviations

In the Ministry of Health and Family Services 2005 Public Perception Study, participants were asked, 'Within the past 12 months have you or a member of your immediate household visited a family doctor?' and 'Within the past 12 months have you or a member of your immediate household visited a specialist?'

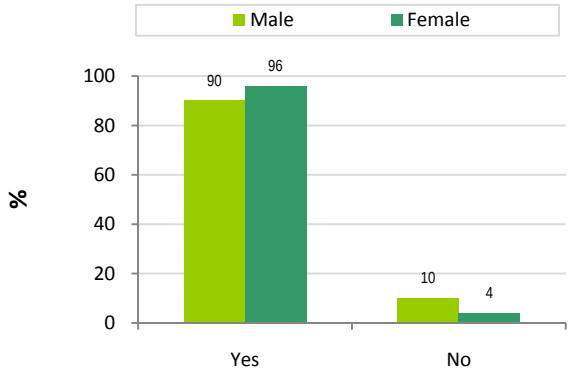
The OECD indicator for consultations with doctors applies a different means to measure consultation, and therefore Bermuda is not compared to OECD countries. The OECD consultations with doctors refer to the number of contacts with physicians (both generalists and specialists) (OECD, 2009, p90).

4.1.1 Percentage of people visiting family doctor in past 12 months, 2005 (BDA)



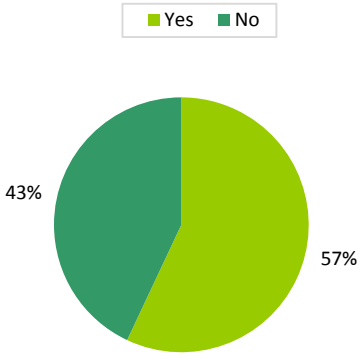
SOURCE: Ministry of Health and Family Services 2005 Public Perception Study

4.1.2 Visited a family doctor in the past 12 months, by gender, 2005 (BDA)



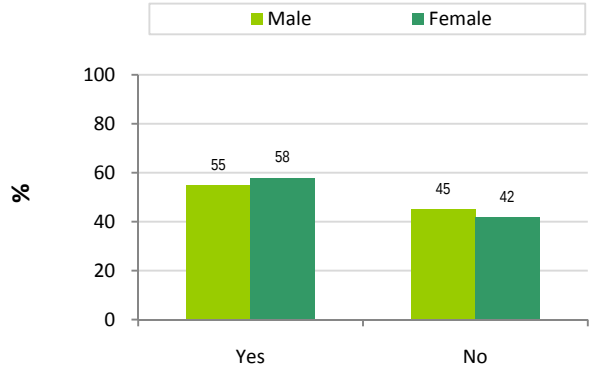
SOURCE: Ministry of Health and Family Services 2005 Public Perception Study

4.1.3 Percentage of people visiting a specialist in past 12 months, 2005 (BDA)



SOURCE: Ministry of Health and Family Services 2005 Public Perception Study

4.1.4 Visited a specialist in the past 12 months, by gender, 2005 (BDA)



SOURCE: Ministry of Health and Family Services 2005 Public Perception Study

4.2 Medical technologies

The availability of modern medical equipment is an indicator for the delivery of up-to-date healthcare services. Computed Tomography (CT) scanners and Magnetic Resonance Imaging (MRI) units are useful in assisting in the diagnosis of certain conditions. Demand for such technologies may be high, but their use contributes to rising healthcare costs.

There is no general recommendation for what the number of MRI or CT units per population should be, but a high ratio may indicate overuse. Due to the high costs of acquisition and operation of these machines, a careful, indication-based use is essential.[49]

Since 2005, Bermuda has had two MRI units and two CT scanners, equating to a rate of 31 units each per million population (Figure 4.2.1). The density rate for both MRI units and CT scans is above the OECD average but similar to the United States rates (Figure 4.2.3 and 4.2.4).

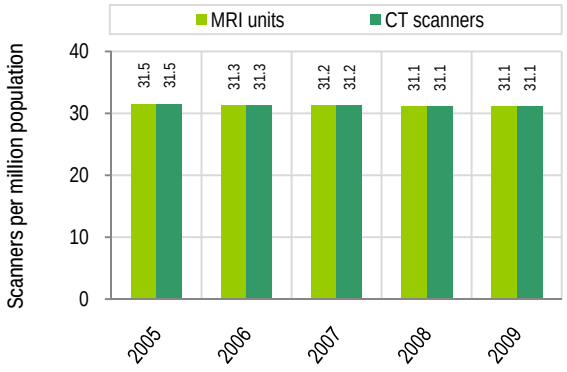
Bermuda utilisation data could only be obtained from one MRI and one CT scanner. Based on this partial data, the number of MRI exams per 1,000 population in Bermuda is higher than the OECD average and similar to the United States (Figure 4.2.4). The number of CT exams per 1,000 population is lower than the OECD average and similar to Canada (Figure 4.2.5). In any jurisdiction, use of CT and MRI exams can be influenced by their availability and physician-patient demand. Further study is needed to understand Bermuda's real utilisation level and its medical necessity.

Definition and deviations

MRI units and CT scanners relate to the number of equipment per million population. Data are normally collected from both the hospital and the ambulatory sector.

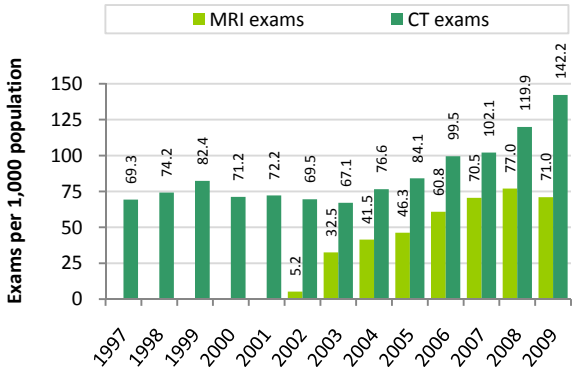
Data for some countries are underestimated. Data on CT scanners and MRI units do not include those outside hospitals in some countries (Spain and Germany) or only a small number (France). For the United Kingdom, the data refer only to scanners in the public sector. For Australia, the number of MRI units (from 1999) includes only those eligible for reimbursement under Medicare, the universal public health system. In 1999, 60% of total MRI units were eligible for Medicare reimbursement (OECD, 2009, p92). In Bermuda, utilisation data could only be obtained for one of the two available MRI units, and one of the two available CT scans. The figures are further underestimated because they exclude MRI and CT scans conducted in overseas facilities.

4.2.1 Number of MRI units and CT scanners per million population (BDA)



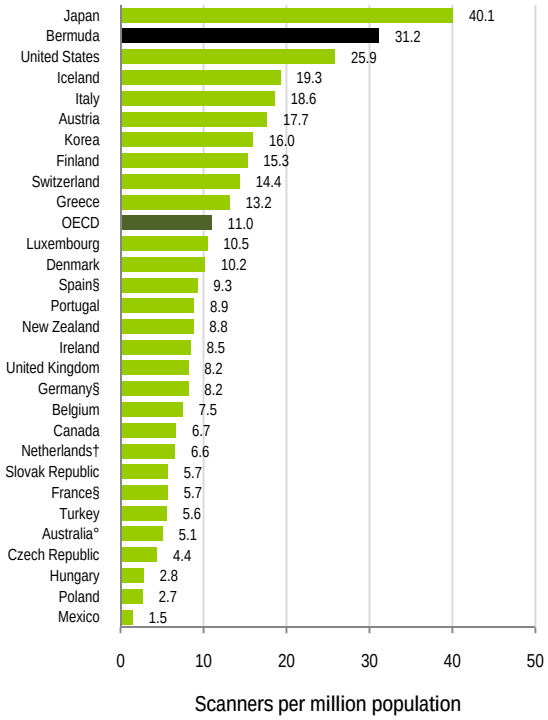
SOURCE: Bermuda Health Systems and Services Profile 2005.

4.2.2 Number of MRI & CT exams per 1,000 population (BDA)

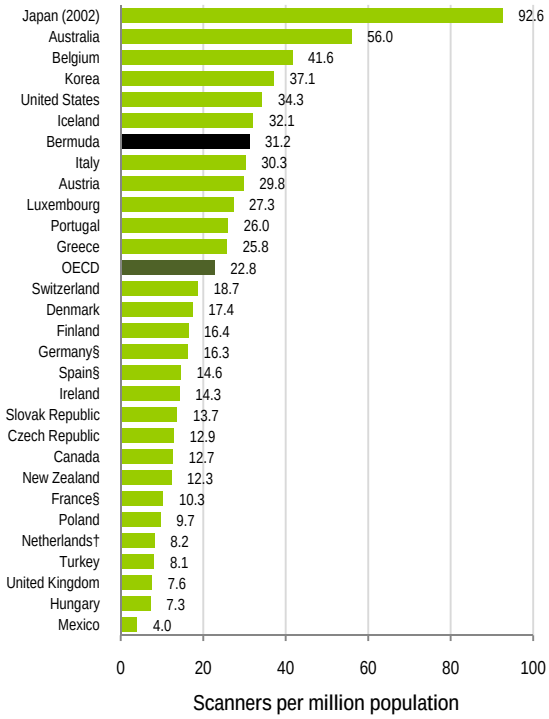


SOURCE: Bermuda Hospitals Board. **NOTE:** Data only reflects exams within the hospital.

4.2.3 Number of MRI units per million population, 2007 (or latest year available)



4.2.4 Number of CT scanners per million population, 2007 (or latest year available)

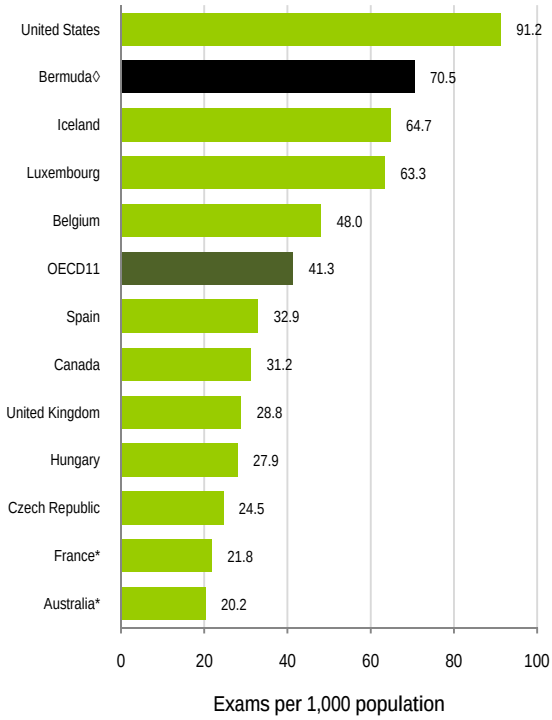


§Only include equipment in hospitals (and a small number of equipment outside hospitals in France). †Only include the number of hospitals reporting to have at least one equipment. °Only MRI units eligible for reimbursement under Medicare.

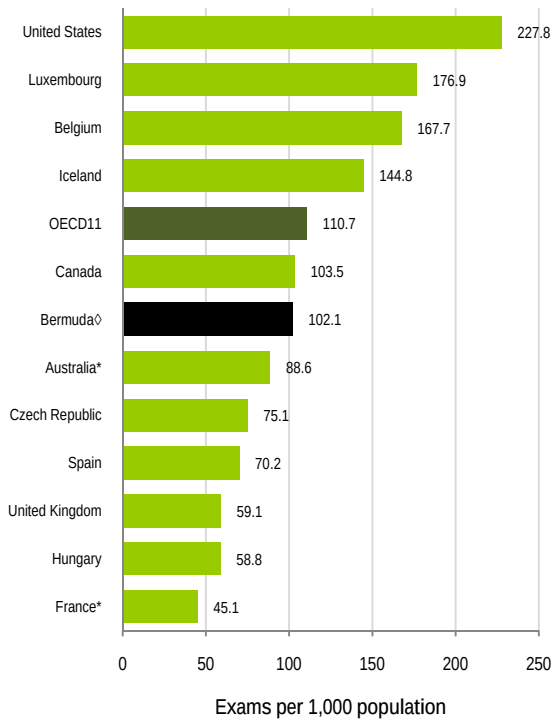
SOURCE: OECD Health Data 2009

SOURCE: OECD Health Data 2009

4.2.5 Number of MRI exams per 1,000 population, 2007 (or latest year available)



4.2.6 Number of CT exams per 1,000 population, 2007 (or latest year available)



* Only include exams for out-patients and private in-patients (excluding exams in public hospitals). ◊ Data for Bermuda only reflects exams within the hospital.

SOURCE: OECD Health Data 2009

4.3 Hospital beds (supply and use)

Hospitals are primarily engaged in providing medical, diagnostic, and treatment services that include physician, nursing, and other health services to in-patients including specialised accommodation services.[50] Data on healthcare resources, such as the availability of hospital beds, therefore, describe the capacity for delivery of these services, and in this case, the availability and use of acute care beds.

The availability of acute care hospital beds has remained relatively stable, with a slight decline during the period under review. This is on par with the OECD average and changes (Figure 4.3.1 and 4.3.3). Figure 4.3.2 shows the fluctuations in the occupancy rate, which is related to the ability of the hospital to deal with chronic care patients and causes some acute care beds to be used for long-term care.

Bermuda's occupancy rate is lower than the OECD average (Figure 4.3.4).However, it is considered that this rate is artificially depressed by chronic care patients in acute care beds and the high percentage of severe patients who require care that is not available in Bermuda and so must be sent to hospitals overseas.

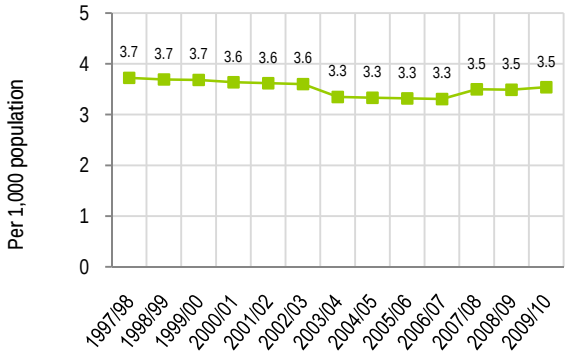
Definition and deviations

Acute care hospital beds normally only include beds available for "curative care" as defined in the OECD Manual, *A System of Health Accounts* (OECD, 2000). The occupancy rate for acute care beds is calculated as the number of hospital bed-days related to acute care divided by the number of available acute care beds (which is multiplied by the number of days, 365).

The functions of care included/excluded in "acute care" vary across countries and across time - for example the extent to which beds allocated for long-term care, rehabilitation, and palliative care are excluded - thereby limiting data comparability. Several countries (e.g. Australia, Austria, Canada, Germany, Ireland, Luxembourg, Netherlands, Poland, Portugal, Spain, Switzerland, Turkey, and the United States) report as acute beds all beds located in "general" or "acute care" hospitals. Also, some acute beds may be used for purposes such as long-term care (e.g. in Japan and Korea). In the Netherlands, the calculation of occupancy rates is based on the number of licensed beds rather than the number of available beds, resulting in a slight under-estimation (the number of licensed beds can be 2 to 10% higher than the number of available beds). Private sector beds are not included, or only partially included, in Hungary and Ireland. Data for Finland are not based on an actual count of beds, but rather estimated by dividing the number of hospital days for acute care by the total number of days in the year (365); this leads to an under-estimation, given that occupancy rate is lower than the assumed 100% rate.

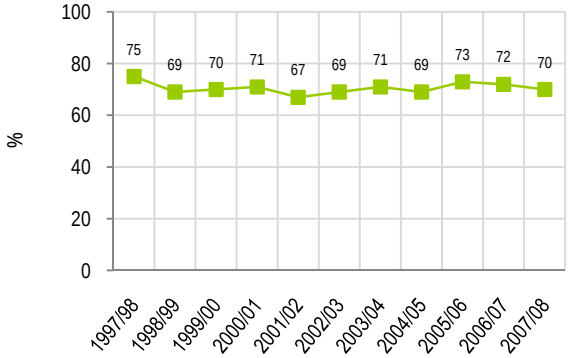
(OECD, 2009, p94)

4.3.1 Acute care hospital beds per 1,000 population (BDA)



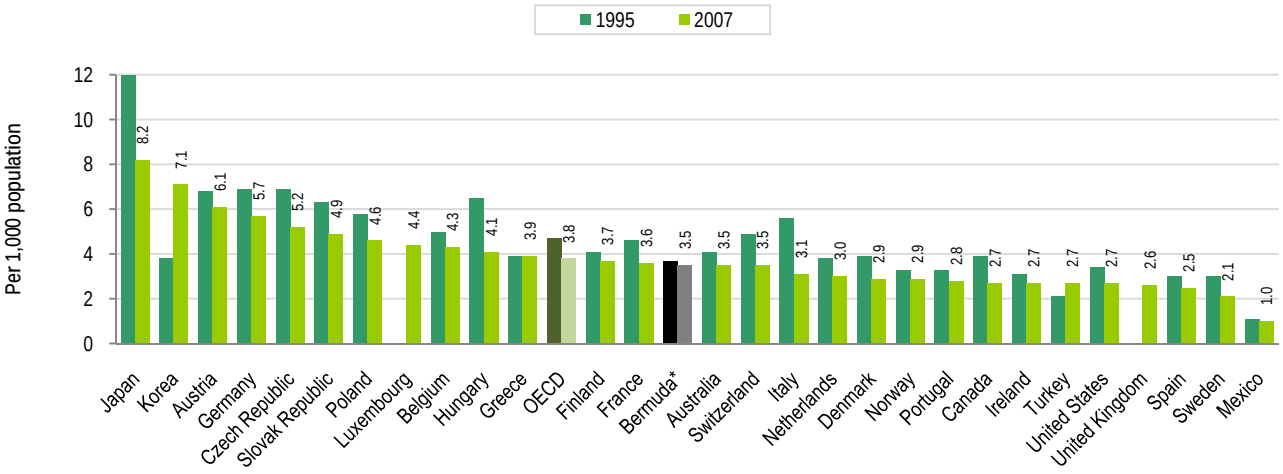
SOURCE: Bermuda Digest of Statistics 2009

4.3.2 Occupancy rate of acute care hospital beds (BDA)



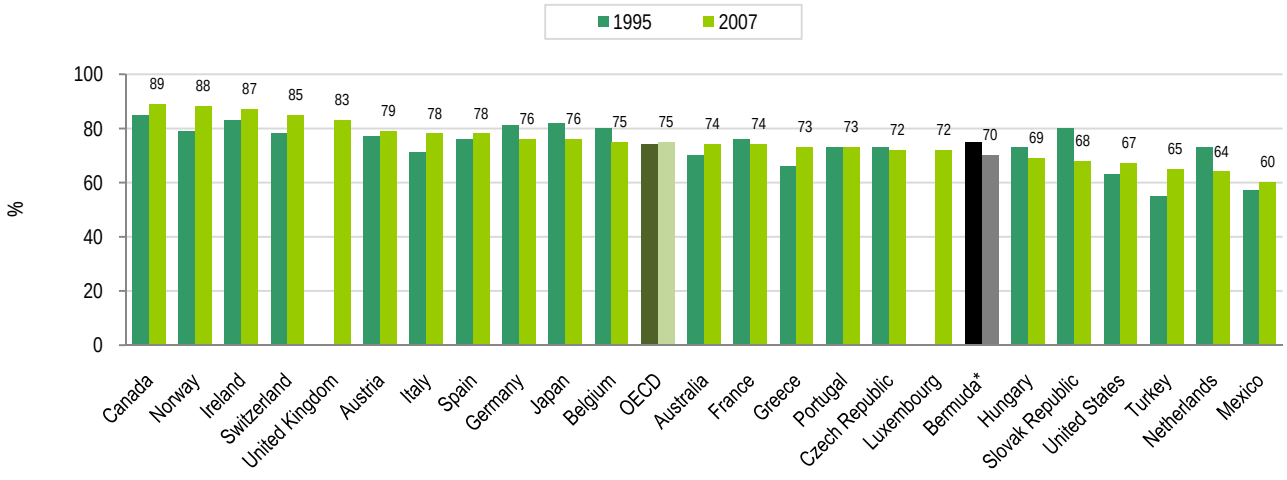
SOURCE: Bermuda Digest of Statistics 2009

4.3.3 Acute care hospital beds per 1,000 population, 1995 and 2007 (or nearest year available)



SOURCE: OECD Health Data 2009

4.3.4 Occupancy rate of acute care hospital beds, 1995 and 2007 (or nearest year available)



SOURCE: OECD Health Data 2009

4.4 Hospital discharges

Hospital in-patient discharges are the most commonly used measure of the utilisation of hospital services. Indicators based on hospital discharges from particular diseases can be used as an estimate of the burden of these diseases on health services. They can also be used as the "second best" measure for the occurrence of certain diseases in the population. Finally, this indicator is often used in assessments of costs and efficiency.

There has been a steady decline in hospital discharge rates (Figure 4.4.1) which is, at least partly, attributable to improved care and management in ambulatory, outpatient and non-hospital settings. With the opening of an urgent care centre in 2009 and the introduction of hospitalists in 2008, fewer patients are being admitted to hospital. In addition, there are a number of organisations involved in prevention efforts and management of chronic conditions especially diabetes, circulatory diseases, and cancer. The efforts of these organisations, coupled with improved care by community-based physicians and improved self-management by persons with chronic conditions, also results in lower admissions for these conditions. Decreased admissions equate to declines in hospital discharge rates.

Figure 4.4.2 shows that there have been moderate declines in admissions for circulatory diseases and cancers. The decline in discharges for circulatory diseases is more pronounced than the decline for cancers, which has remained relatively low and constant. This is partly due to the availability of oncologists for in-hospital cancer care. Many cancer patients are sent abroad for care.

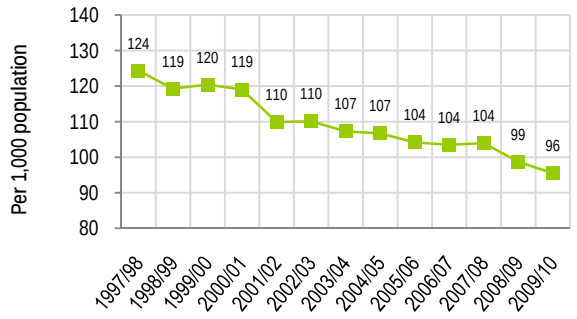
Bermuda's hospital discharge rate is lower than the majority of OECD countries (Figure 4.4.3). This is related to the low case-mix index of Bermuda's sole hospital. A significant proportion of patients requiring advanced care are sent directly abroad for treatment.

Definition and deviations

Discharge is defined as the release of a patient who has stayed at least one night in hospital following inpatient care. Same-day separations are usually excluded, with the exceptions of Canada, France and the United States which include some same-day separations. Healthy babies born in hospitals are excluded completely (or almost completely) from hospital discharge rates in several countries (e.g. Australia, Canada, Finland, Greece, Ireland, Japan, Korea, Luxembourg, Mexico, Norway, Sweden, Turkey). Ireland also excludes discharges related to pregnancy and childbirth and certain conditions originating in the perinatal period. Some countries do not cover all hospitals. For instance, data for Denmark, Ireland, Mexico, Poland and the United Kingdom are restricted to public or publicly-funded hospitals only. Data for Portugal relate only to hospitals on the mainland (excluding the Islands of Azores and Madeira).

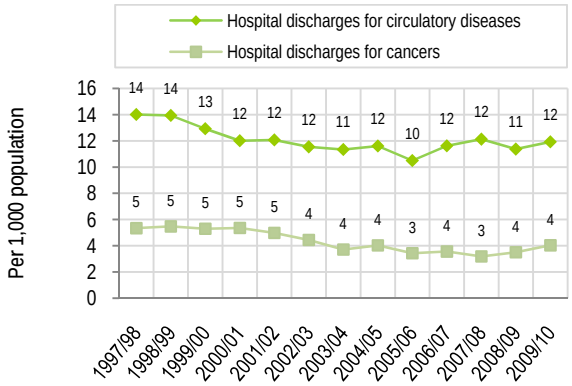
(OECD, 2009, p96)

4.4.1 Hospital discharges per 1,000 population (BDA)



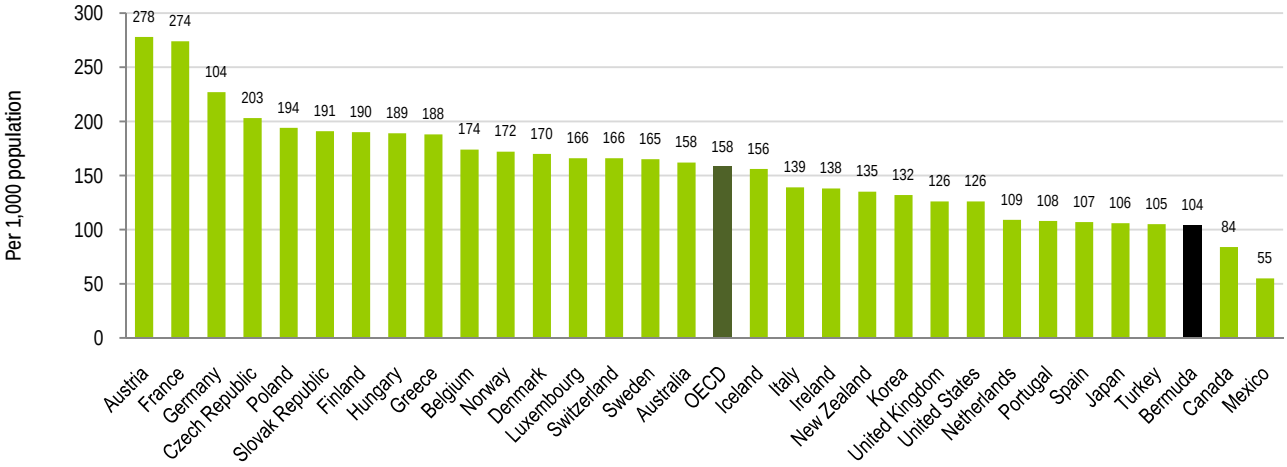
SOURCE: Bermuda Hospitals Board

4.4.2 Hospital discharges for circulatory diseases and cancers per 1,000 population (BDA)



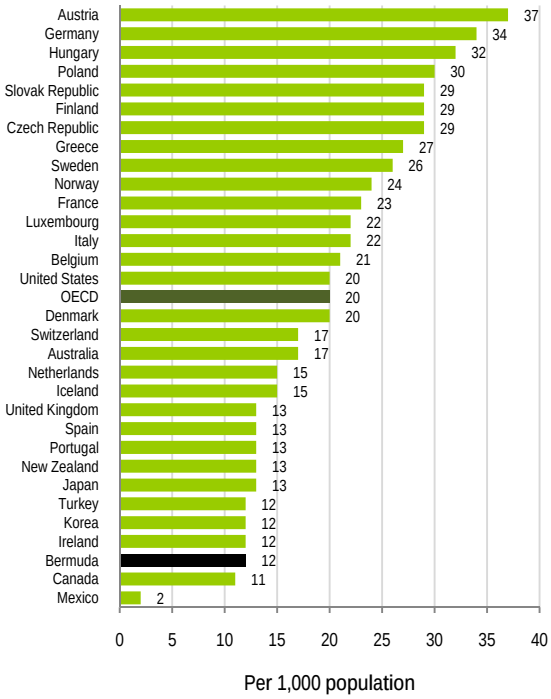
SOURCE: Bermuda Hospitals Board

4.4.3 Hospital discharges per 1,000 population, 2007 (or nearest year)



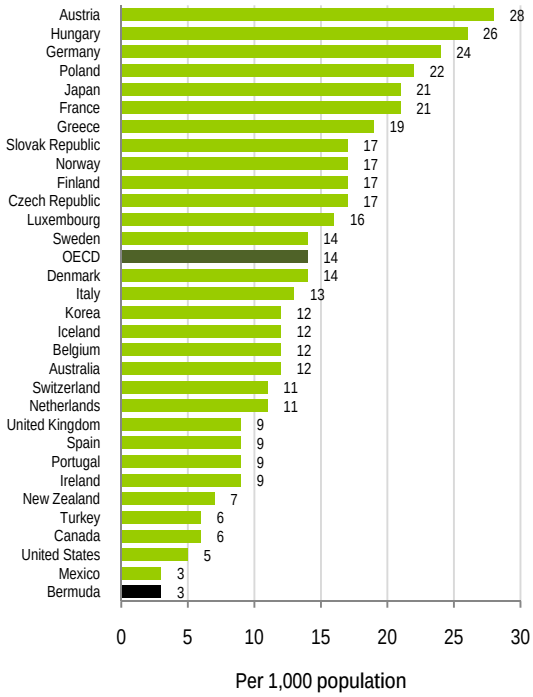
SOURCE: OECD Health Data 2009

4.4.4 Hospital discharges for circulatory diseases per 1,000 population, 2007 (or latest year available)



SOURCE: OECD Health Data 2009

4.4.5 Hospital discharges for cancers per 1,000 population, 2007 (or latest year available)



SOURCE: OECD Health Data 2009

4.5 Average length of stay in hospitals

Average length of stay (ALOS) is used in assessment of quality of care, costs, and efficiency. Inpatients can leave hospital because of the finalisation of treatment, transfers to another healthcare institution, by signing out against medical advice, and death. The average length of stay and the reason for discharge is often dependent on the reason for admission.

Unlike the observed decreases in ALOS in OECD countries, the ALOS in Bermuda has remained relatively steady (Figures 4.5.1 and 4.5.4). Factors influencing the decline in other countries, such as changes in hospital payment methods to prospective pricing systems, have not occurred in Bermuda. Additionally, the case-mix index (CMI) of Bermuda's sole hospital is low which has a direct impact on ALOS.

Figure 4.5.2 shows the ALOS for acute myocardial infarctions (AMI). The yearly variation is reflective of the availability of cardiologists on island. In addition, there have been patients initially admitted for AMI who are no longer receiving acute care and become long-term care patients, but are still included in the ALOS calculation. This inflates the ALOS and accounts for the uncharacteristically high ALOS in 2006/07 and 2007/08. Given the fluctuations in ALOS, a 5-year average was used in the comparison to the OECD countries (Figure 4.5.5). As the 5-year average includes the years with the uncharacteristically high rates, Bermuda appears to have higher ALOS for AMI than all of the OECD countries. However, even if those years are excluded, Bermuda is still well above the OECD average. This reinforces the limitations in efficiency of care related to the availability of cardiologists.

Average length of stay for normal delivery has remained stable at around two days (Figure 4.5.3). Bermuda, similarly to Canada and the United Kingdom, has adopted a philosophy that the best place for a normal baby and mother is at home; therefore, the ALOS for normal delivery in Bermuda is fairly short and below the OECD average (Figure 4.5.6).

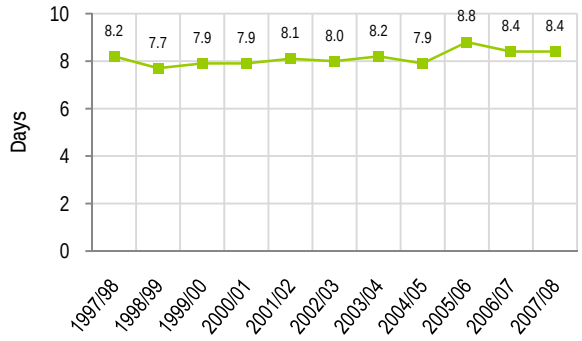
Definition and deviations

Average length of stay (ALOS) for acute care refers to the average number of days that patients spend in hospital. It is generally measured by dividing the total number of days stayed by all patients in acute-care units in hospital during a year by the number of admissions or discharges.

The definition of "acute care" includes all the functions of care covered under "curative care" as defined in the OECD Manual, A System of Health Accounts (OECD, 2000). However, there are variations across countries in the functions of care included/excluded in "acute care", thereby limiting data comparability (e.g. whether or not beds for rehabilitation, palliative care and long-term care are included). In the calculation of ALOS, days and discharges of healthy babies born in hospitals are excluded or only partially counted in some countries. Including healthy newborns would reduce the ALOS in these countries (e.g. by about half-a-day in Canada).

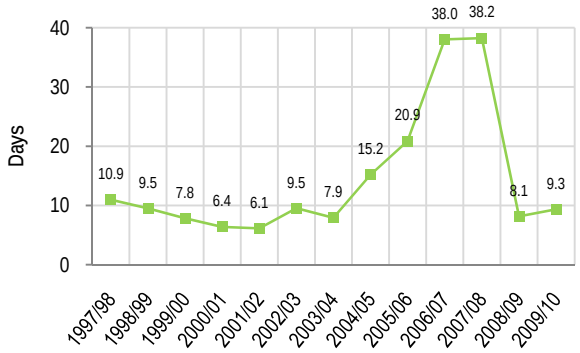
(OECD, 2009, p98)

4.5.1 Average length of stay for acute care (BDA)



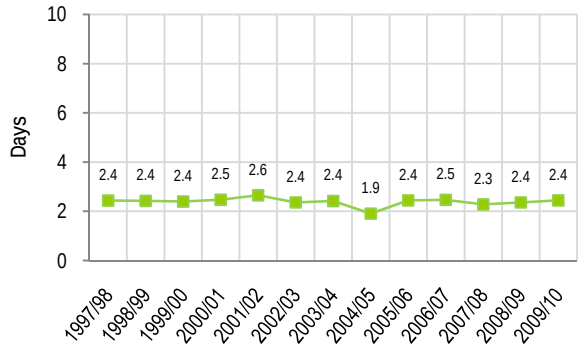
SOURCE: Bermuda Digest of Statistics 2009

4.5.2 Average length of stay following acute myocardial infarction (BDA)



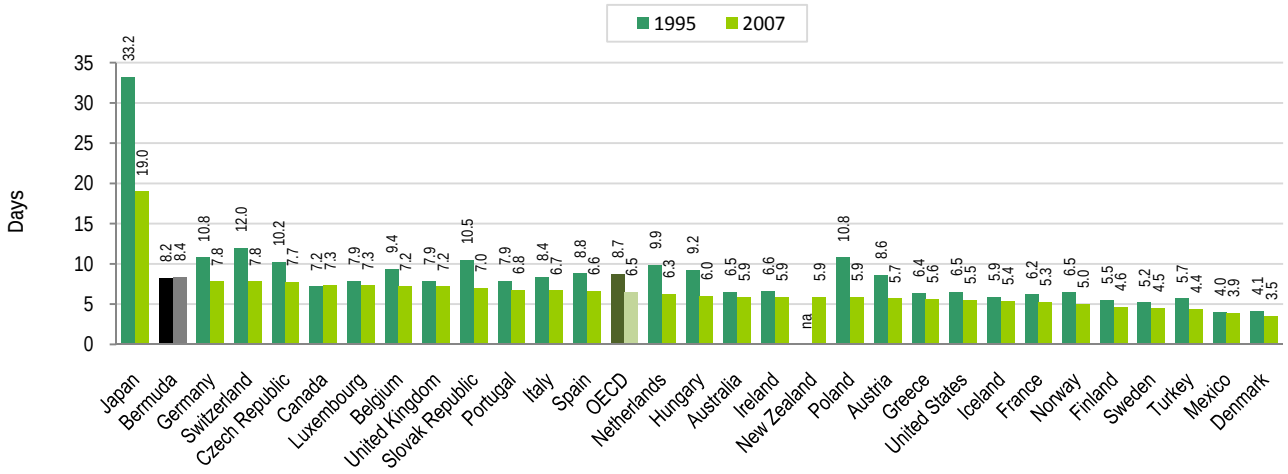
SOURCE: Bermuda Hospitals Board. **NOTE:** Unusually high numbers in 2006/7 and 2007/08 are due to one patient in each year who acquired a total of 2,918 days and 3,312 days, respectively.

4.5.3 Average length of stay for normal delivery (BDA)



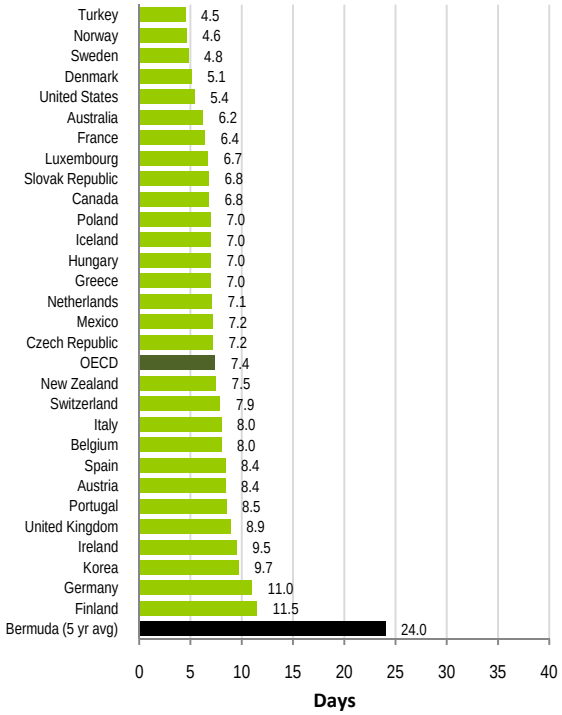
SOURCE: Bermuda Hospitals Board

4.5.4 **Average length of stay for acute care, 2007** (or latest year available)



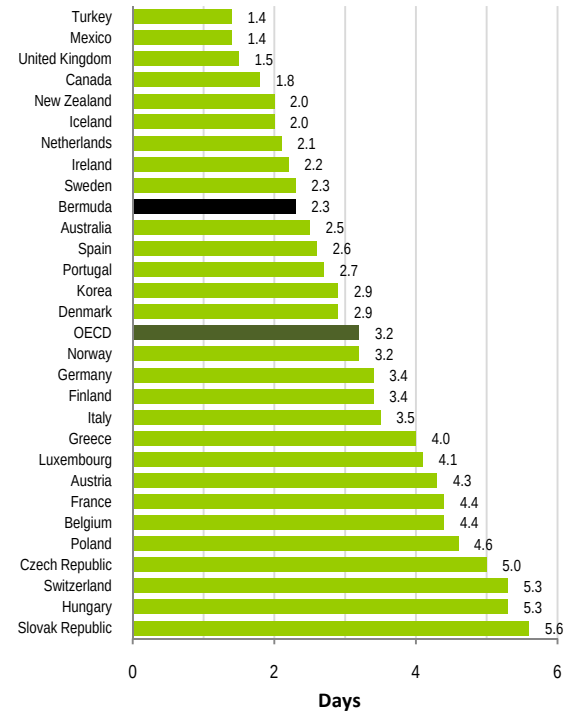
SOURCE: OECD Health Data 2009

4.5.5 **Average length of stay following acute myocardial infarction (AMI), 2007** (or latest year available)



SOURCE: OECD Health Data 2009

4.5.6 **Average length of stay for normal delivery, 2007** (or latest year available)



SOURCE: OECD Health Data 2009

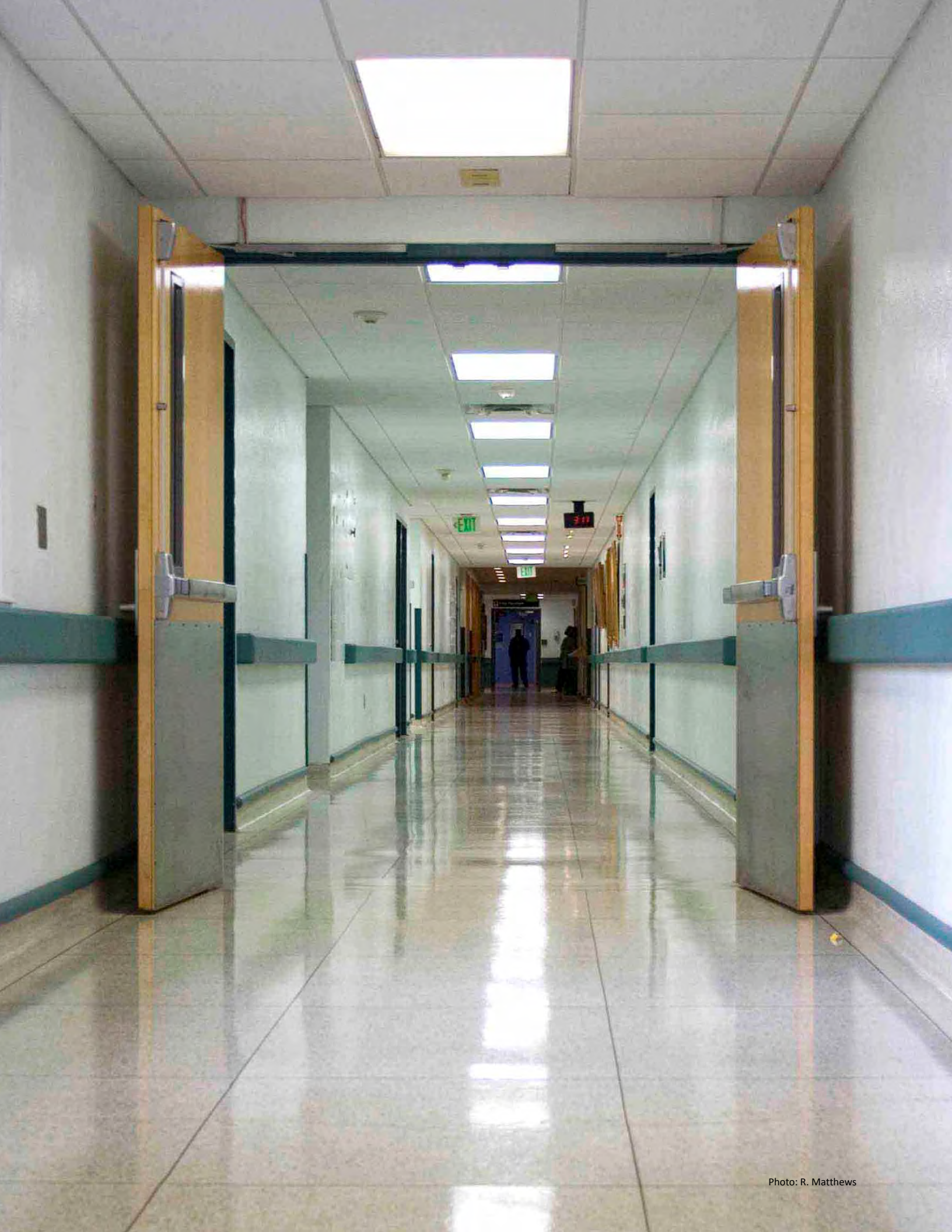


Photo: R. Matthews

4.6 Treatment of renal failure

End-stage renal failure (ESRF) is a condition in which the kidneys are permanently impaired and can no longer function normally. Some of the main risk factors for end-stage renal failure include diabetes and hypertension. When patients reach end-stage renal failure, they require treatment either in the form of dialysis or through kidney transplants. This indicator is therefore a proxy measure of the underlying causes and a measure of the efficiency of care for the underlying causes.

While the number of kidney transplants per year varies, the number of patients being treated for end-stage renal failure has steadily increased (Figure 4.6.1). The number of kidney transplants, while an indicator of the number of patients with ESRF that cannot survive without extensive dialysis sessions, is dependent on available kidneys. Also, Bermuda does not perform kidney transplants, therefore all patients requiring a kidney transplant must travel abroad for surgery. The increase in patients treated for ESRF is related to the increases in diabetes and hypertension in the population and the management of these patients (see Indicator 5.2 Avoidable admissions: diabetes complications and Indicator 5.3 Avoidable admissions: congestive heart failure and hypertension).

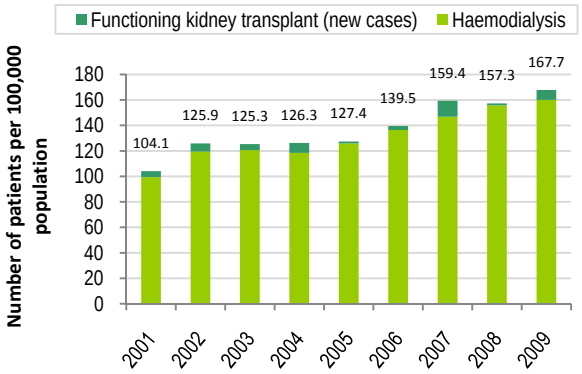
Bermuda's rate of ERSF treatments is considerably higher than the OECD average and just under the rate in the United States (Figure 4.6.2). A comparison of the number of persons with functioning kidney transplants should not be made as Bermuda's indicator definition differs from the OECD definition.

Definition and deviations

The number of patients treated for end-stage renal failure refers to the number of patients at the end of the year who are receiving different forms of renal replacement therapy: haemodialysis/ haemoinfiltration, intermittent peritoneal dialysis, continuous ambulatory peritoneal dialysis, continuous cyclical peritoneal dialysis, or living with a functioning kidney transplant (OECD, 2009, p102).

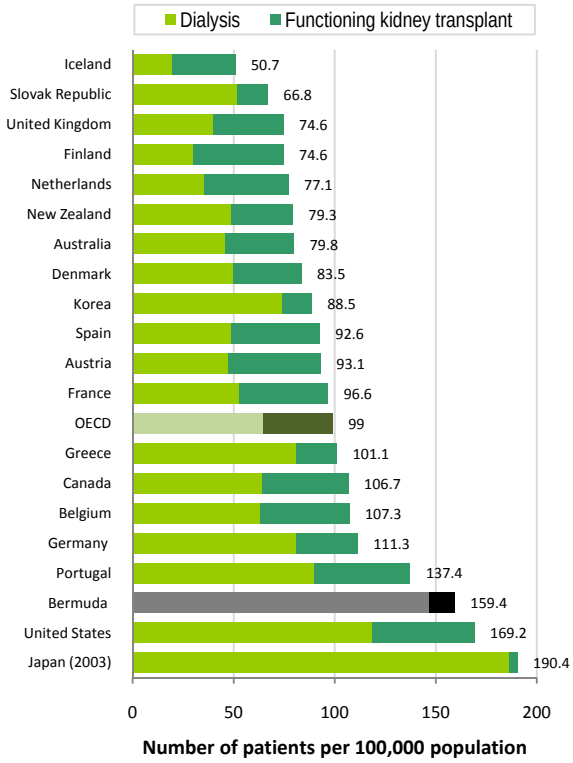
The Bermuda figures for functioning kidney transplants only includes the number of new transplants performed each year, not the number of people living with a functioning kidney transplant.

4.6.1 Patients treated for end-stage renal failure (BDA)



SOURCE: Dr. Beresford Swan Dialysis Unit, KEMH. **NOTE**: All kidney transplants are performed abroad.

4.6.2 Patients treated for end-stage renal failure, 2007



SOURCE: OECD Health Data 2009. **NOTE:** Bermuda data only includes kidney transplants that occurred in 2007. It does not include other people who are living with a functioning kidney transplant.

4.7 Caesarean sections

Historically caesarean section rates have been used as an indicator of access to, and use of, healthcare services during pregnancy and childbirth because caesarean sections were usually performed only when vaginal delivery would put the mother, or baby's, life or health at risk. Recent years have seen a shift to caesarean births due to reasons that are not necessarily medically indicated. As this indicator does not provide information on the reason for undergoing a caesarean section, the extent to which caesarean sections are performed according to clinical need is not possible to determine.[51]

There have been moderate increases in the rate of caesarean sections in Bermuda (Figure 4.7.1). Bermuda's caesarean section rate was higher than the OECD average but lower than the rate in the United States (Figure 4.7.2) The rate of increase, 1997 to 2007, was lower than both the OECD average and much lower than the rate in the United States. Part of this, however, is because Bermuda's rates in 1997 were already higher than both the OECD average and the United States (Figures 4.7.3 and 4.7.4).

Comparisons to the United States are made as currently all obstetricians practicing in Bermuda are US- trained. It is common in the United States to oppose post-maturity (i.e. pregnancies going beyond the estimated date of delivery or estimated date of confinement). These patients are usually offered induction of labour at around 41-42 weeks. If patients refuse induction of labour or fail induction of labour then a caesarean section is performed.

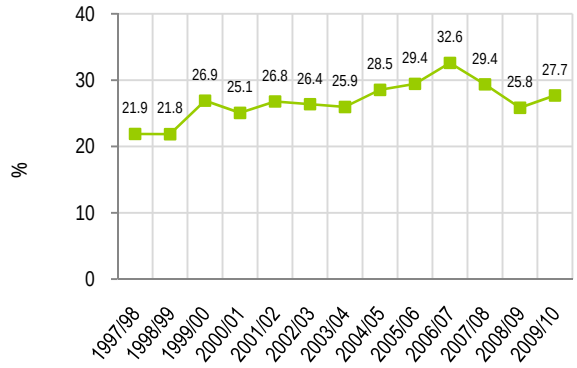
Definition and deviations

Caesarean section rate is the number of caesareans per 100 live births.

In Portugal, the denominator is only the number of live births which took place in National Health Service Hospitals on the mainland (resulting in an over-estimation of caesarean rates). In Mexico, the number of caesarean sections is estimated based on public hospital reports and data obtained from National Health Surveys. Estimation is required to correct for under-reporting of caesarean deliveries in private facilities. The combined number of caesarean deliveries is then divided by the total number of live births as estimated by the National Population Council.

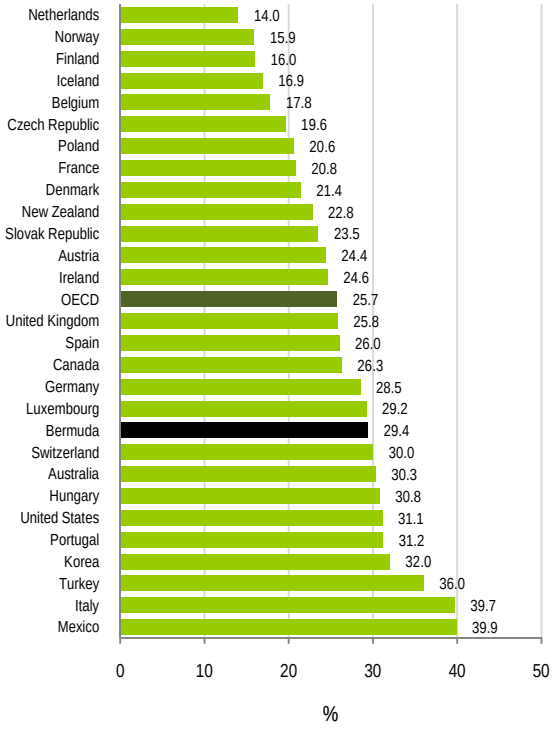
(OECD, 2009, p104)

4.7.1 Caesarean sections per 100 live births (BDA)



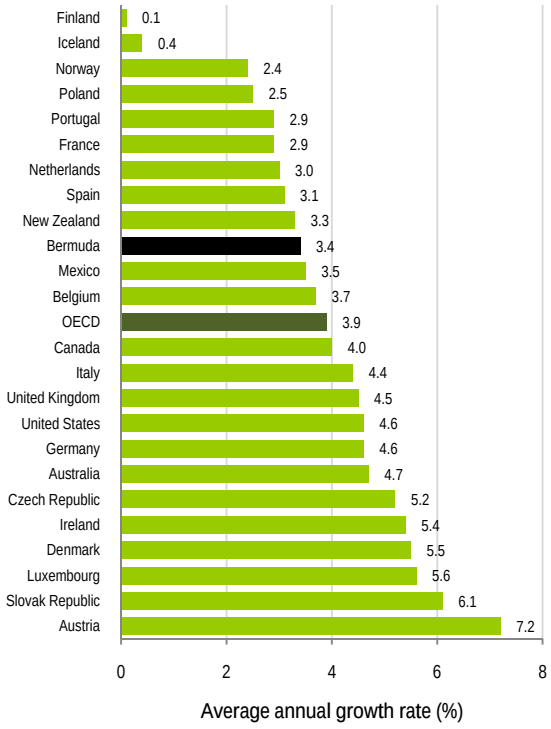
SOURCE: Bermuda Hospitals Board

4.7.2 Caesarean sections per 100 live births, 2007 (or latest year available)



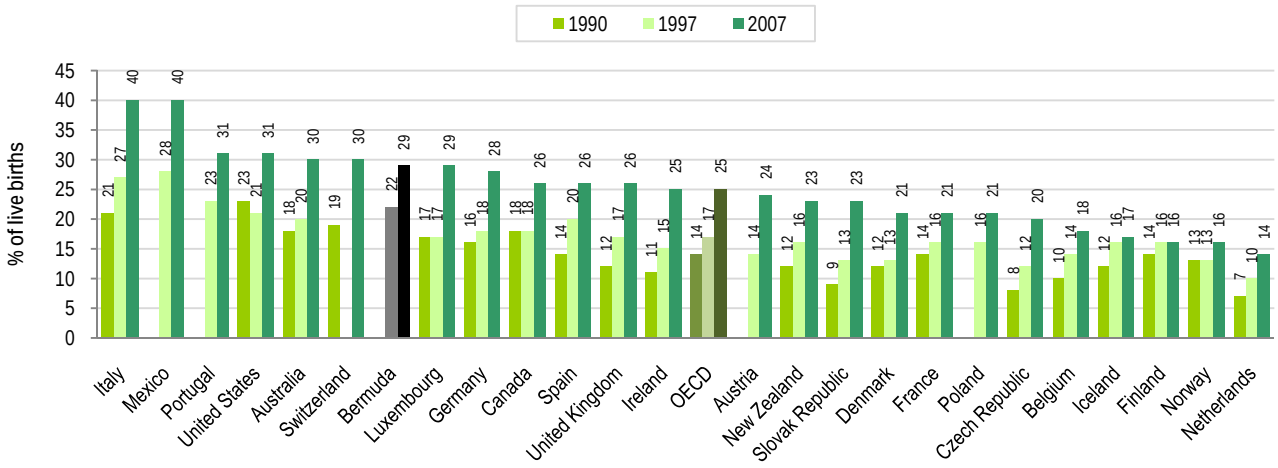
SOURCE: OECD Health Data 2009

4.7.3 Rise in caesarean sections per 100 live births, 1997- 2007 (or latest year available)



SOURCE: OECD Health Data 2009

4.7.4 Caesarean sections per 100 live births, 1990-2007 (or nearest year)



SOURCE: OECD Health Data 2009

4.8 Cataract surgeries

Cataract surgeries consist of removing the lens of the eye which has been affected by cataracts and replacing it with an artificial lens to restore normal vision. The surgery may be carried out as day cases or as in-patient cases. The number of cataract surgeries is an indicator of the prevalence of cataracts in the population and availability of appropriate medical resources. The capacity to perform these surgeries as day cases is an indicator for aspects of accessibility and up-to-date quality of care.

The number of inpatient cataract surgeries declined significantly between 1997/98 and 2009/10. However, in recent years there has been a dramatic increase in the number of cataract surgeries performed as day cases (Figure 4.8.1). While the number of ophthalmologists practicing within Bermuda has not changed over the past ten years (approximately three full time equivalent), the sharp increase in day cases can be attributed to improved techniques and an ageing population.

Bermuda is comparable to the OECD average in terms of the number of cataract surgeries performed per 100,000 population (Figure 4.8.2) and is among the majority of OECD countries in which the share of cataract surgeries carried out as day cases exceeds 90% (Figure 4.8.3).

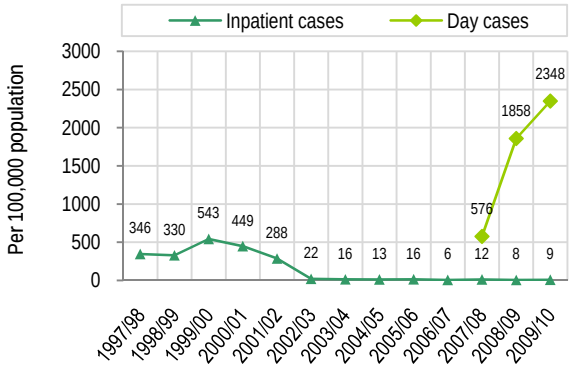
Definition and deviations

This indicator measures the number of cataract surgeries performed in hospitals, including day-cases, per 100,000 population per year.

Caution is required in making cross-country comparisons of available data, given the incomplete coverage of day surgeries in several countries. Denmark only includes cataract surgeries carried out in public hospitals, excluding procedures carried out in the ambulatory sector and in private hospitals. In Ireland too, the data cover only procedures in public hospitals (it is estimated that over 10% of all hospital activity in Ireland is undertaken in private hospitals). The data for Spain only partially include the activities in private hospitals. Classification systems and registration practices for cataract surgeries also vary across countries; for instance, whether they are counted as one intervention involving at least two steps (removal or the lens and replacement with an artificial lens) or as two separate interventions.

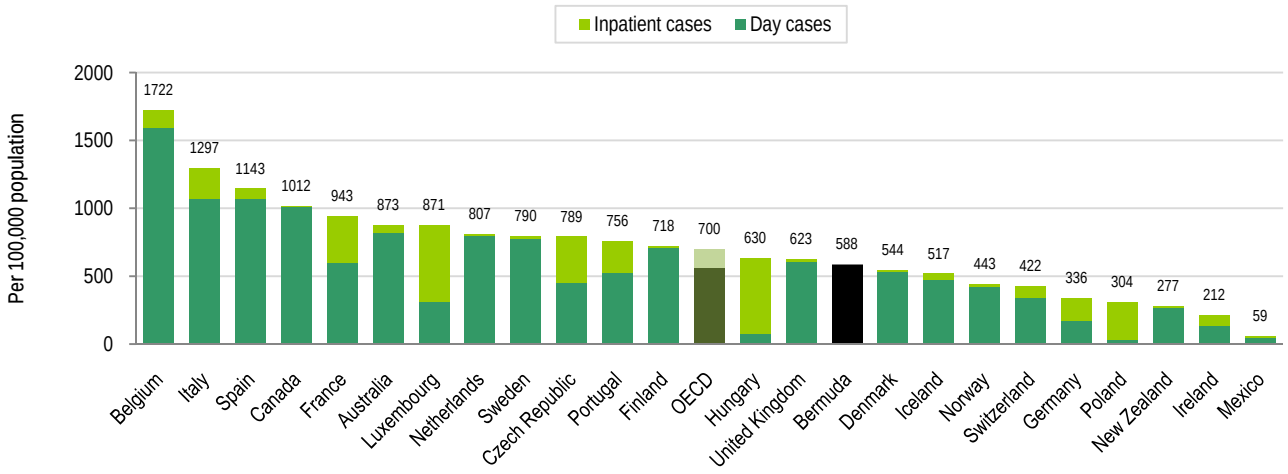
(OECD, 2009, p106)

4.8.1 Number of cataract surgeries, inpatient and day cases, per 100,000 population (BDA)



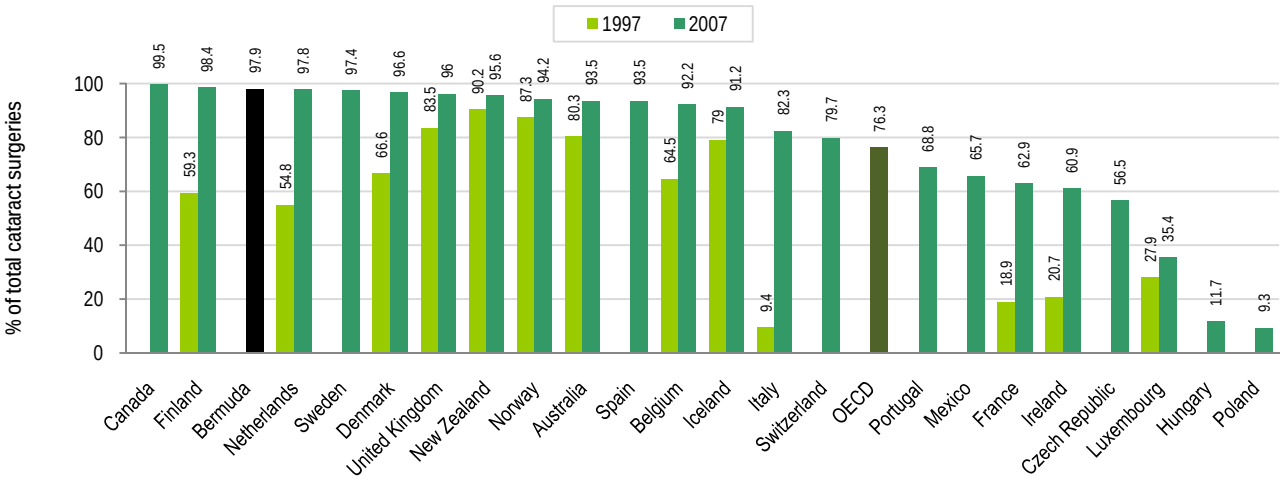
SOURCE: Bermuda Hospitals Board. **NOTE**: Only includes hospital surgeries. Coding and abstracting outpatient surgeries did not occur until November 2007. The decrease in inpatient cataract surgeries is due to surgeries being performed as outpatient.

4.8.2 Number of cataract surgeries, inpatient and day cases, per 100,000 population, 2007 (or nearest year)



SOURCE: OECD Health Data 2009

4.8.3 Share of cataract surgeries carried out as day cases, 1997 and 2007 (or nearest year)



SOURCE: OECD Health Data 2009

5. QUALITY OF CARE

Care for Chronic Conditions

5.1 Avoidable admissions: respiratory disease

Hospitalisations due to asthma and chronic obstructive pulmonary diseases (COPD) could be reduced if managed and treated according to established guidelines. Effective management includes control of exposure to factors that trigger exacerbations, adequate pharmacological management, continual monitoring of the disease, and patient education. Therefore, hospital admission rates for these conditions reflect the relative efficiency of primary care.

Asthma admission rates have fluctuated but there is a general decline (Figure 5.1.1). COPD rates have shown a more consistent decline (Figure 5.1.2). These declines are, at least partly, attributable to community education; there is a school based community asthma nurse and a local charity that specialised in helping persons with asthma and COPD, including the provision of basic necessary equipment and education for effective self-care. In addition there have been reductions in readmissions to hospital for asthma and COPD as discharge planning has improved. As primary physicians and patients adhere to prescribed care plans the patient should not have to be readmitted for respiratory complications. Figures 5.1.3 and 5.1.4 show the trends in asthma and COPD admissions by gender, which follow the same general patterns as the overall rates. The declines are more evident among males who also had higher initial rates of asthma and COPD hospitalisation, which is related to gender differences in smoking behaviour.

Despite the declines in asthma admission rates in Bermuda, the rates are almost twice the OECD averages, overall and by gender (Figures 5.1.5 and 5.1.6). Bermuda does not have the capacity to manage chronic asthma. There are at present no pulmonary specialists, respiratory therapists, or internists specialising in asthma care. Bermuda's COPD admission rates, however, are well below the OECD average and are among the lowest of all countries presented (Figure 5.1.7). These differences can be related to the age of the patients; COPD patients are generally much older than asthma patients and may be more compliant. In addition, reductions in smoking behaviour and improved care plans have a greater effect in this older population.

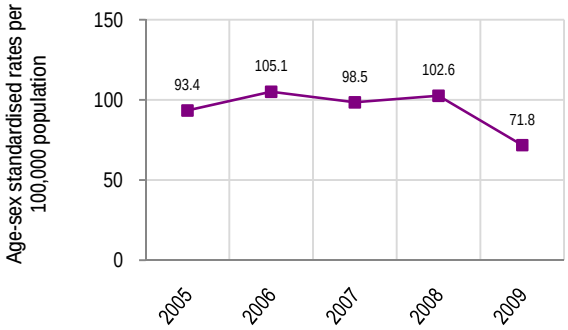
Definition and deviations

The avoidable asthma and chronic obstructive pulmonary disease (COPD) hospital admission rate is defined as the number of hospital admissions of people aged 15 years and over per 100,000 population in that age group per year.

There is evidence of differences in diagnosis and coding between asthma and COPD across countries which points to limitations in the relative precision of the specific disease rates. Direct comparison of the asthma admission rates between the 2007 and 2009 editions of Health at a Glance is cautioned, given the rates for 2009 have been adjusted to take account of differences in the age and sex composition of each country's population and the age cohort has been revised from 18 years to 15 years and over. The prevalence estimates for COPD were self-reported by countries and the validity and comparability of these rates have not been fully assessed.

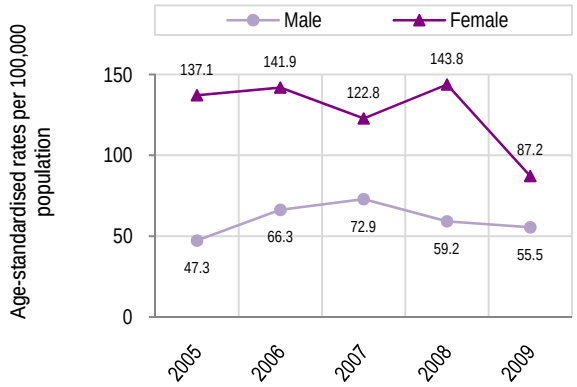
(OECD, 2009, p116)

5.1.1 Asthma admission rates, population aged 15 and over (BDA)



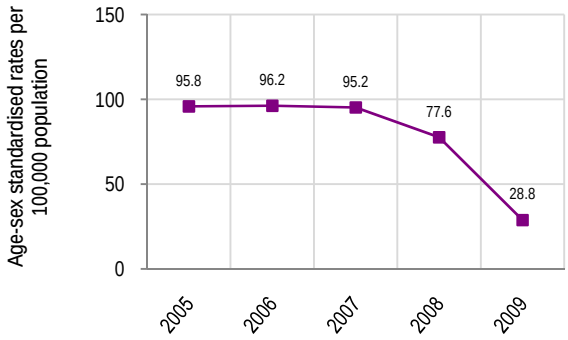
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.1.2 Asthma admission rates, population aged 15 and over, by gender (BDA)



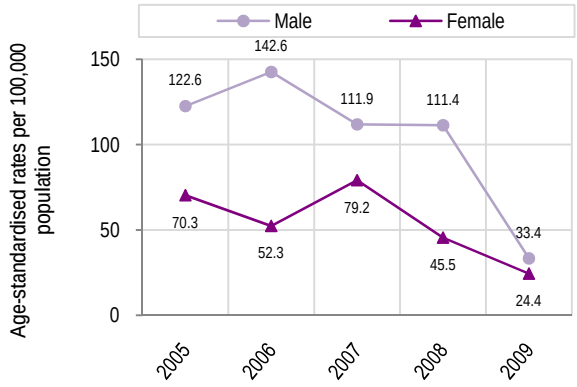
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.1.3 COPD admission rates, population aged 15 and over (BDA)



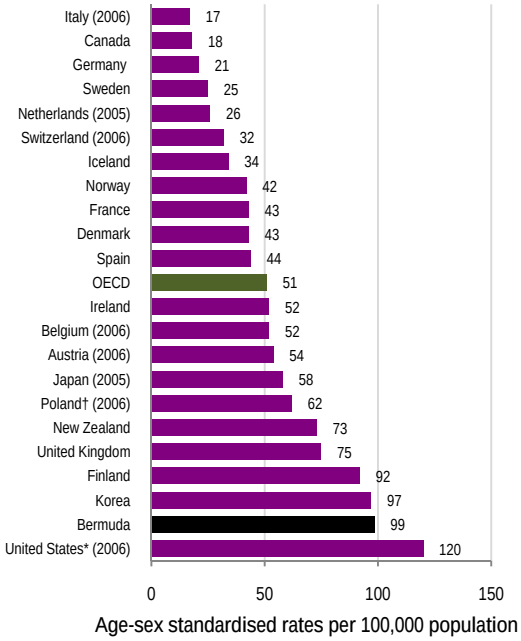
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.1.4 COPD admission rates, population aged 15 and over, by gender (BDA)



SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

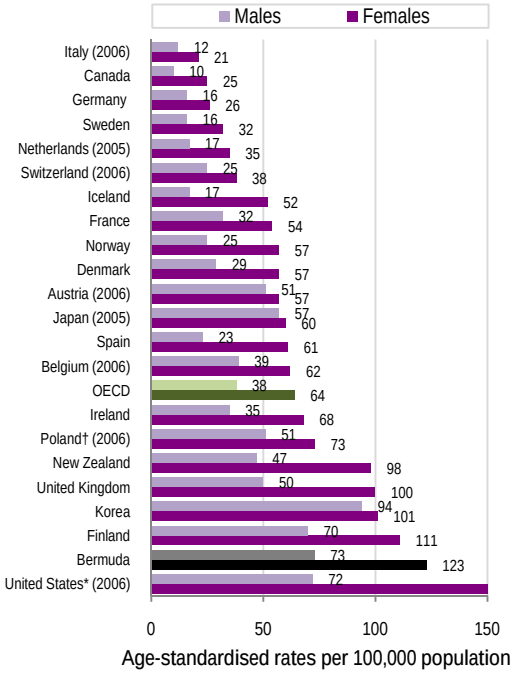
5.1.5 Asthma admission rates, population aged 15 and over, 2007



* Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

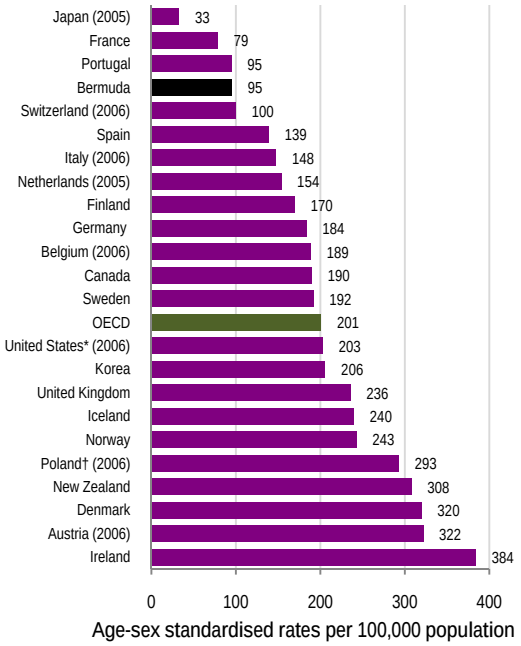
5.1.6 Asthma admission rates, population aged 15 and over, by gender, 2007



* Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

5.1.7 COPD admission rates, population aged 15 and over, 2007



* Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

5.2 Avoidable admissions: diabetes complications

Appropriate diet, exercise, and drug treatment combined with proper foot care can reduce the risk of lower extremity amputation. These measures, in addition to patient education, self-management, screening, and treatment for eye and kidney abnormalities can also prevent most other complications of diabetes that may require hospitalisation. As most diabetes-related health services are available outside of hospital, both admissions for acute diabetic complications and lower extremity amputations are suitable measures of the quality of primary care. As diabetes is a chronic disease and many cases go undiagnosed, years might pass before improvements in patient self-management and clinical practice affect diabetes-related hospitalisation rates.

Following a period of decline, diabetes lower extremity amputation rates have been increasing in recent years (Figure 5.2.1). This pattern is more pronounced among males who also have generally higher rates of amputation than women (Figure 5.2.2). The rate has been relatively stable among females.

Diabetes acute complication admission rates have been increasing (Figure 5.2.3). There has been a steady increase in rates among males, while females show a steady, yet moderate decline, except in 2008 when there was an unusually high rate (Figure 5.2.4). This data indicates that in general, females may be more compliant with treatment plans.

Figures 5.2.5, 5.2.6 and 5.2.7 show Bermuda's rates in comparison to OECD rates. In almost all cases, the Bermuda rates are twice as high as the OECD average and similar to rates in the United States (where rates are inflated due to the inclusion of some day-cases). These elevated rates reiterate the high incidence of diabetes in Bermuda and the need for standardisation of care and management of persons with diabetes among general practitioners. It is expected that the recently published Guidelines for Diabetes Care in Bermuda 2009,[52] will greatly assist in addressing this issue.

While the United States and Bermuda both have high rates of diabetes-related lower extremity amputation and high diabetes prevalence, a strong correlation is not shown by all of the OECD countries indicating that the underlying rate of diabetes does not explain the variation in amputation rates (Figure 5.2.8).

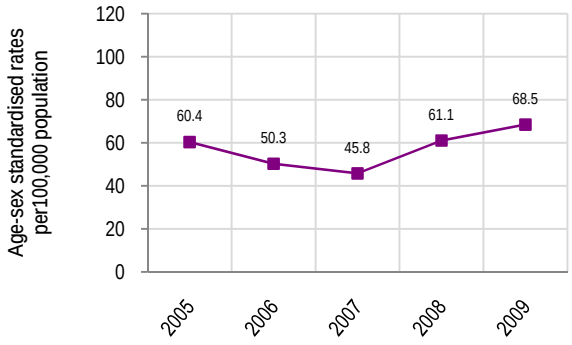
Definition and deviations

Avoidable diabetes acute complication and lower extremity amputation hospital admission rates are defined as the number of hospital admissions of people aged 15 years and over per 100,000 population in that age group per year.

Coding practices for primary and secondary diagnoses between countries might affect indicator rates. The rates have been adjusted to take account of differences in the age and sex composition of each country's population. The definition of the lower extremity amputation indicator includes amputation of the foot and toes in addition to more major amputations, such as above ankle, through knee and up to hip amputations. Minor amputations of the toe and foot do not necessarily indicate poor quality of care, as they may be carried out to prevent major amputations. In addition, given some minor amputations can be performed in certain primary care settings, clinical practices between countries might also affect indicator rates. Since definition relies on specific procedure codes, different classification systems in use across countries may impact on the comparability of the data.

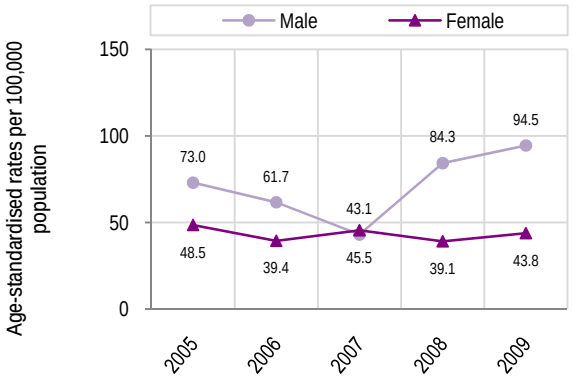
(OECD, 2009, p118)

5.2.1 Diabetes lower extremity amputation rates, population aged 15 and over (BDA)



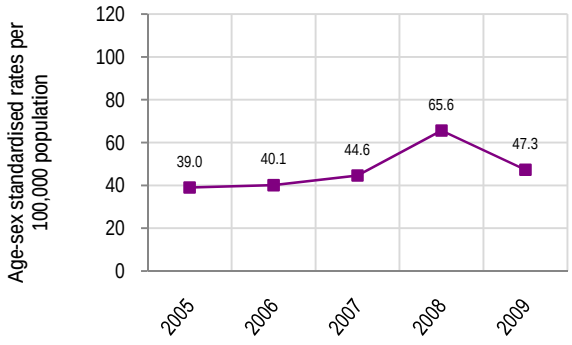
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.2.2 Diabetes lower extremity amputation rates, population aged 15 and over, by gender (BDA)



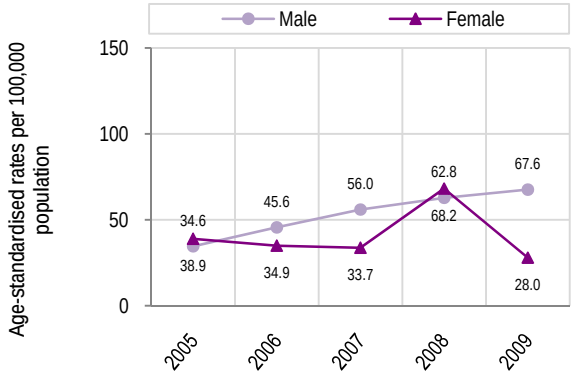
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.2.3 Diabetes acute complications admission rates, population aged 15 and over (BDA)



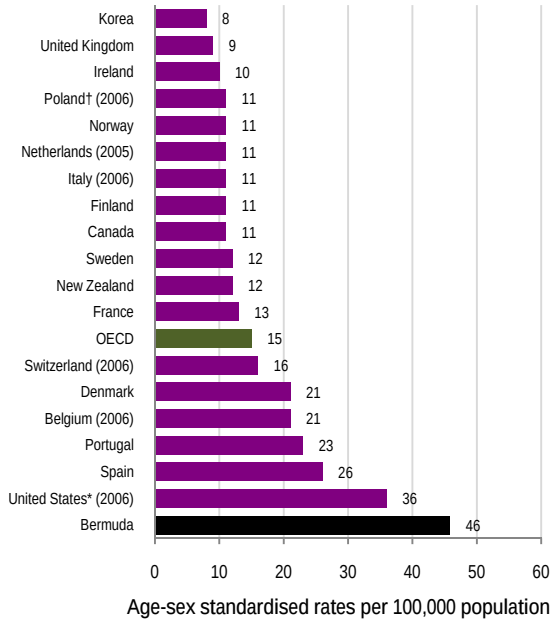
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.2.4 Diabetes acute complications admission rates, population aged 15 and over, by gender (BDA)



SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

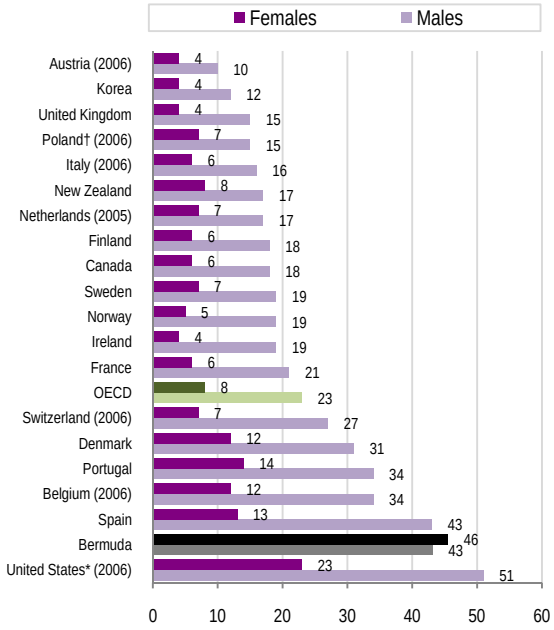
5.2.5 Diabetes lower extremity amputation rates, population aged 15 and over, 2007



*Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

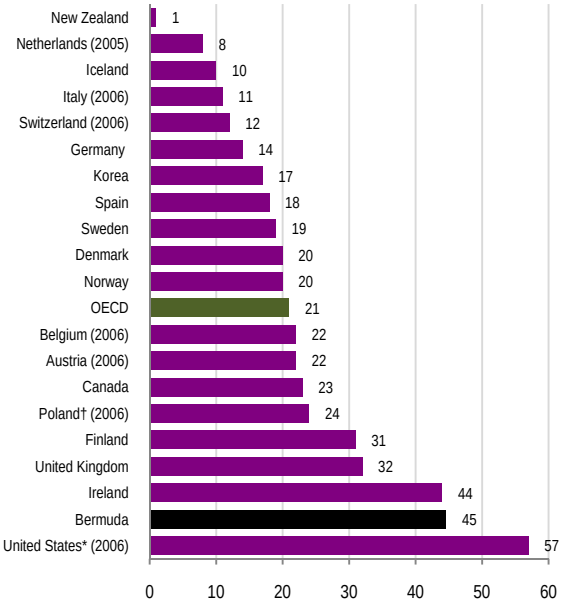
5.2.6 Diabetes lower extremity amputation rates, population aged 15 and over, by gender, 2007



*Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

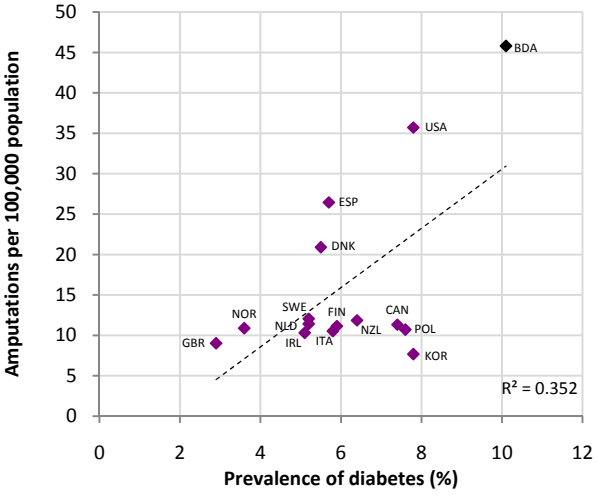
5.2.7 Diabetes acute complications admission rates, population aged 15 and over, 2007



*Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

5.2.8 Diabetes lower extremity amputation rates and prevalence of diabetes, 2007



SOURCE: OECD Health Care Quality Indicators Database 2009. The total rates have been age-sex standardised to the 2005 OECD population. Diabetes prevalence (aged 20-79 years) are estimates made by the International Diabetes Federation (2006) Diabetes Atlas 3rd Edition. The 95% confidence intervals are represented by H in the relevant charts.

Photo: R. Matthews

5.3 Avoidable admissions: congestive heart failure and hypertension

Hospital admission for congestive heart failure (CHF) and hypertension are indicators of the quality of primary care. Provided that persons with these conditions adhere to appropriately prescribed treatment, the improved medications and outpatient therapies now available can reduce admissions, decrease morbidity and mortality, and improve their quality of life.

Hospital admissions for CHF, although decreasing, are very common in Bermuda (Figure 5.3.1). Bermuda's rate is higher than the rates in most OECD countries, but lower than the US rate (Figure 5.3.5). Declines in CHF admission rates have occurred irrespective of gender, although the decline is more pronounced among males (Figure 5.3.2). As with the overall rate, the CHF admission rate by gender is also substantially higher than the OECD average (Figure 5.3.6).

Hospital admission rates for hypertension are generally low compared to other OECD countries (Figure 5.3.7), but the trend in Bermuda remains unclear. Overall, hypertension admission rates increased between 2005 and 2008 followed by a decline in 2009 (Figure 5.3.3). Future years of data are needed to see if this decline continues. However given the rates by gender one may anticipate a stabilisation of the overall rate because the gender-specific rates appear to be converging following a period of wide variation (Figure 5.3.4).

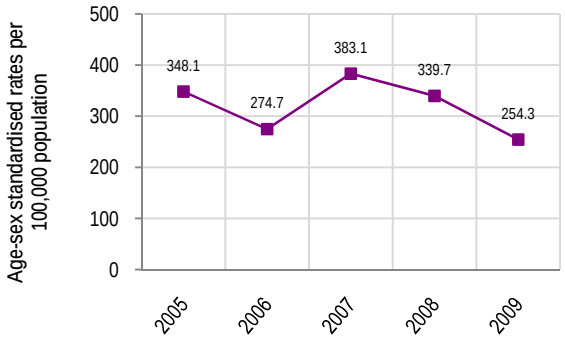
Any decrease in these rates, congestive heart failure and hypertension, can be partly attributed to better adherence to improved discharge instructions and detailed discharge plans resulting in fewer readmissions to hospital.

Definition and deviations

The avoidable CHF and hypertension hospital admission rates are defined as the number of hospital admissions of people aged 15 years and over per 100,000 population in that age group per year. The rates have been adjusted to take account of differences in the age and sex composition of each country's population. Given the technical definition of these indicators includes the specification of procedure codes, the different classification systems in use across countries may impact on the comparability of the data.

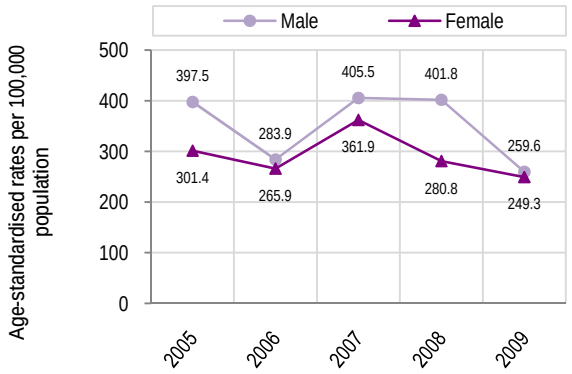
(OECD, 2009, p120)

5.3.1 CHF admission rates, population aged 15 and over (BDA)



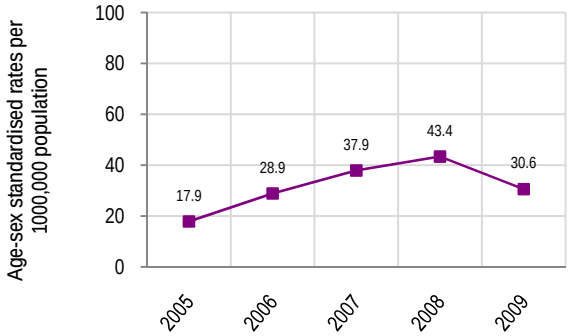
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.3.2 CHF admission rates, population aged 15 and over, by gender (BDA)



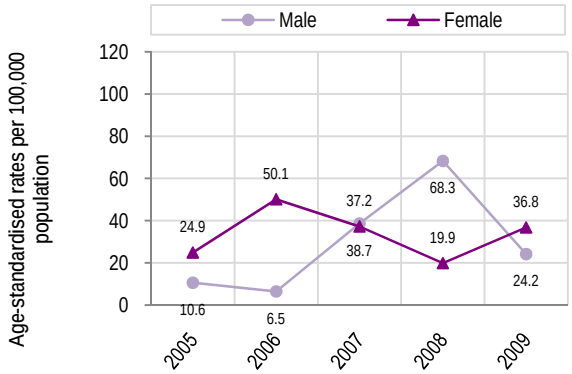
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.3.3 Hypertension admission rates, population aged 15 and over (BDA)



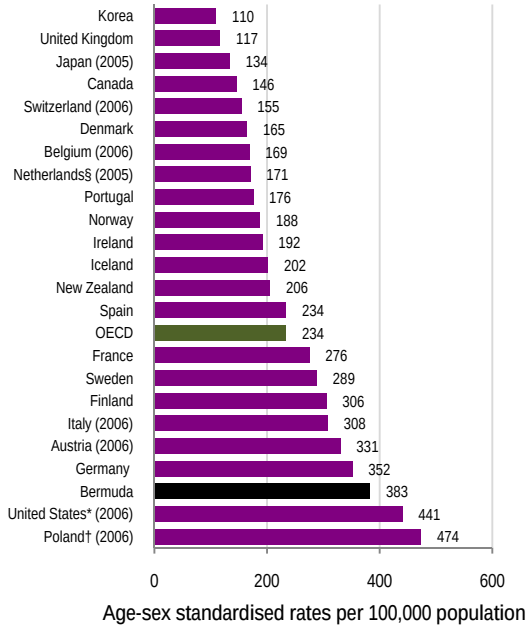
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.3.4 Hypertension admission rates, population aged 15 and over, by gender (BDA)



SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

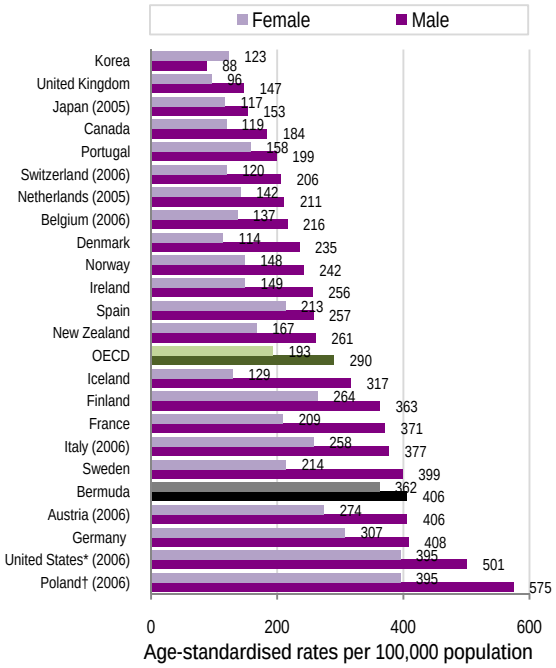
5.3.5 CHF admission rates, population aged 15 and over, 2007



Rates are age-sex standardised to 2005 OECD population. *Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates. § Includes admissions for additional diagnosis codes, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009.

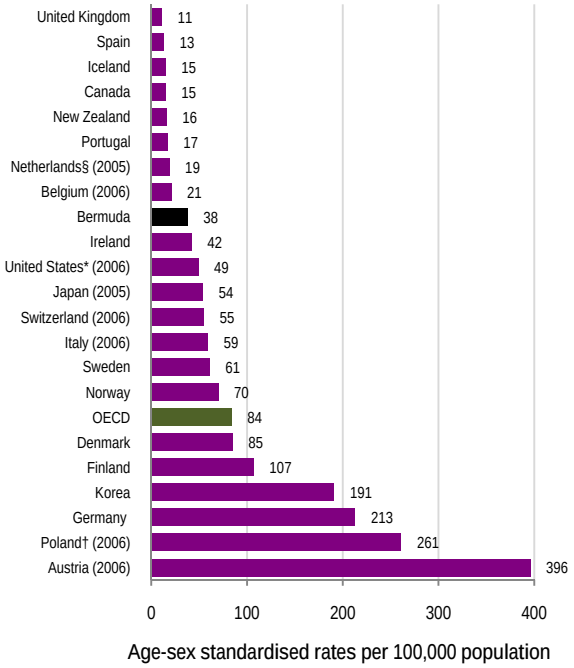
5.3.6 CHF admission rates, population aged 15 and over, by gender, 2007



Rates are age-sex standardised to 2005 OECD population. *Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates. § Includes admissions for additional diagnosis codes, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009.

5.3.7 Hypertension admission rates, population aged 15 and over, 2007



Rates are age-sex standardised to 2005 OECD population. *Does not fully exclude day cases. † Includes transfers from other hospital units, which marginally elevates rates. § Includes admissions for additional diagnosis codes, which marginally elevates rates.

SOURCE: OECD Health Care Quality Indicators Data 2009.

Acute Care for Chronic Conditions

5.4 In-hospital mortality following acute myocardial infarction

Rapid treatment of acute myocardial infarctions, commonly known as heart attacks, reduces heart muscle damage, improves heart muscle function, and subsequently lowers the death rate. In addition, early recognition of heart attacks by patients themselves or bystanders, emergency retrieval times, and quality of the emergency services have an effect on case-fatality. A wide variety of hospital resources need to be mobilised to provide care for this illness so the AMI case-fatality rate is a good measure of acute care quality.

There have been declines in the AMI in-hospital case-fatality rate (Figure 5.4.1). This decline is more evident in males than females, though there is no clear trend in female rates (Figure 5.4.2). This is likely due to differences in the recognition of AMI in males and females. Prompt recognition and diagnosis of heart attacks is essential for effective treatment but women tend to experience fewer typical symptoms of heart attack than men, which results in a more difficult, and hence delayed, diagnosis.

In comparison to OECD countries, Bermuda's AMI in-hospital case-fatality rate is higher than the OECD rates, with the crude rate being higher than all OECD countries (Figure 5.4.3). Looking at the age-standardised rates, the overall rate is closer to the OECD average, while the male rate is below the average and the female rate is higher (Figure 5.4.4). The higher rates in Bermuda are likely due to resources, which limit efficient on-island treatment. Severe cases require overseas transfers to tertiary care centres, and some may not survive through the transfer process.

While actual rates are above the OECD average, Bermuda's rate of decline in AMI in-hospital mortality has been more rapid than reported by the other countries (Figure 5.4.5). Local hospital improvements may have contributed to this decline, though further research is needed to determine the causes conclusively.

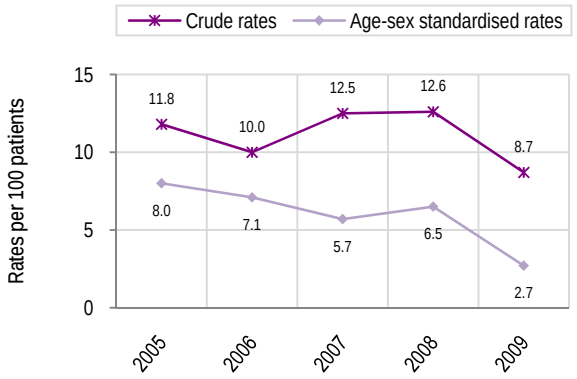
Definition and deviations

The in-hospital case-fatality rate following acute myocardial infarction (AMI) is defined as the number of people who die within 30 days of being admitted (including same day admissions) to hospital with an AMI. Both crude and age-sex standardised rates are presented. Standardised rates adjust for differences in age (45+ years) and sex and facilitate more meaningful international comparisons. Crude rates are likely to be more meaningful for internal consideration by individual countries and enable a more direct comparison with the crude rates presented for this indicator in Health at a Glance 2007.

Ideally, rates would be based on individual patients; however, not all countries have the ability to track patients in and out of hospital, across hospitals or even within the same hospital because they do not currently use a unique patient identifier. Therefore, this indicator is based on individual hospital admissions and restricted to mortality within the same hospital. Differences in practices in discharging and transferring patients may influence the findings.

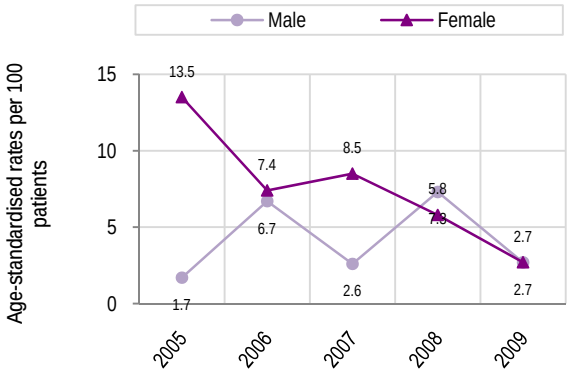
(OECD, 2009, p122)

5.4.1 In-hospital case-fatality rates within 30 days after admission for AMI (BDA)



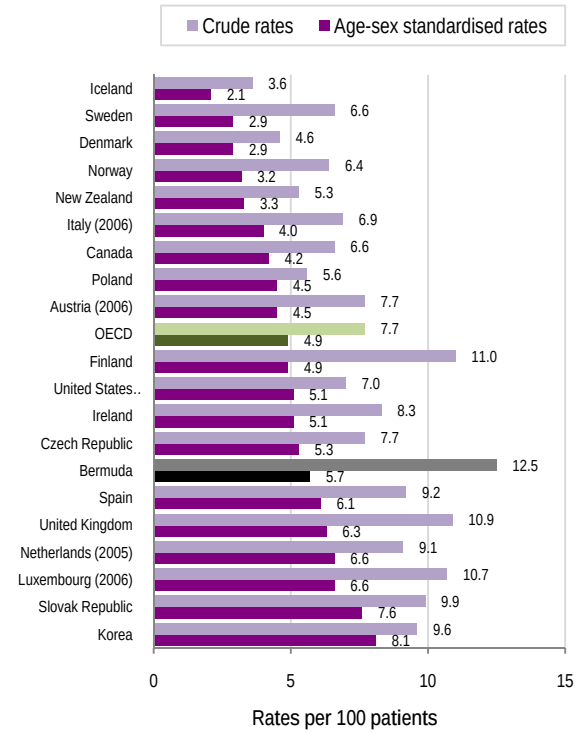
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population (45+).

5.4.2 In-hospital case-fatality rates within 30 days after admission for AMI, by gender (BDA)



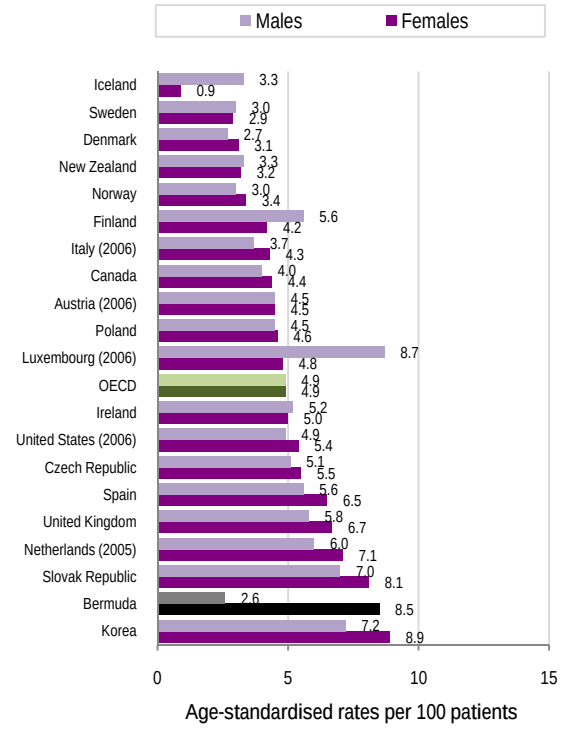
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population (45+).

5.4.3 In-hospital case-fatality rates within 30 days after admission for AMI, 2007



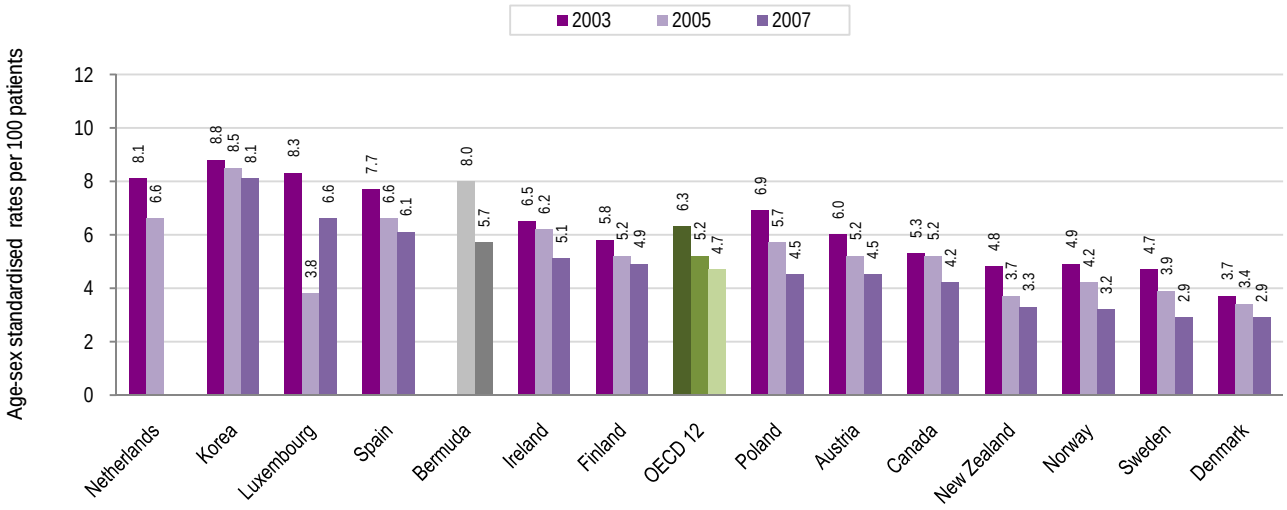
SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population (45+).

5.4.4 In-hospital case-fatality rates within 30 days after admission for AMI, by gender, 2007



SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population (45+).

5.4.5 Reduction in in-hospital case-fatality rates within 30 days after admission for AMI, 2003-07 (or nearest year available)



SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population (45+).


No P1
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V5
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mm
II 0.2
V5 0.8
aVL -0.1
V5
0.8
SpO2
%
97
NIBP
mmHg Sys Dia
145/84
Mean (108)
15 min
T1
°C
T1
Silence Alarms
Alarms Setup
Monitor Setup
Take Snapshot
Record/ Print
Help
Admit/ Discharge
Pt. Data & Trends
Other Patients
Auto On/Off
Start Cancel
Zero P1
Zero P2
Zero P4
Start C.O.
Zero P3
NIBP
P1
P4
P3

5.5 In-hospital mortality following stroke

As appropriate and timely treatment can improve survival from stroke, the in-hospital case-fatality rate measures the quality of the treatment of acute exacerbations of chronic cardiovascular diseases in hospitals. The mortality/case-fatality rate is also important for comparing stroke outcomes between jurisdictions, and trends can reflect changes in prevention, treatment, and other factors.

The in-hospital case-fatality rates following ischemic stroke have remained relatively stable, while the rates following haemorrhagic stroke have declined (Figures 5.5.1 and 5.5.2). This is seen more clearly in the age-standardised rates. The crude rates are similar to the OECD average, but once age-standardised the rate for ischemic stroke remains below the OECD average, while the rate for haemorrhagic stroke was significantly above the OECD average and higher than all of the OECD countries (Figures 5.5.3 and 5.5.4). It should be noted, however, that the benchmark year was a year with one of the highest case-fatality rates for haemorrhagic stroke during the period under review.

Figure 5.5.5 illustrates that a correlation exist between case-fatality rates for ischemic and haemorrhagic stroke. This infers that countries achieving better survival for one type of stroke typically do well for the other type.[53] This is expected as the initial steps of care for stroke patients are similar, regardless of the type of stroke.

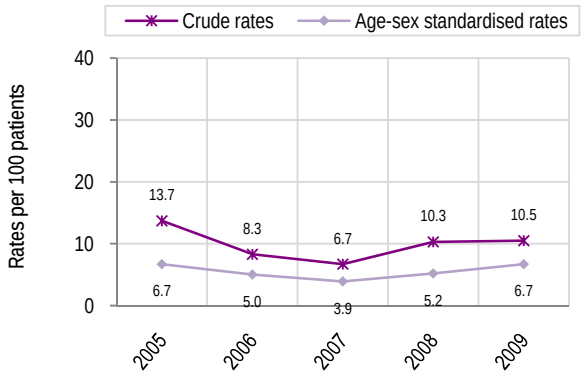
Definition and deviations

The in-hospital case-fatality rate following ischemic and hemorrhagic stroke is defined as the number of people who die within 30 days of being admitted (including same day admissions) to hospital. Both crude and age-sex standardised rates are presented. Standardised rates adjust for differences in age (45+ years) and sex and facilitate more meaningful international comparisons. Crude rates are likely to be more meaningful for internal consideration by individual countries and enable a more direct comparison with the crude rates presented for this indicator in Health at a Glance 2007.

Ideally, rates would be based on individual patients, however, not all countries have the ability to track patients in and out of hospital, across hospitals, or even within the same hospital given they do not currently use a unique patient identifier. Therefore, this indicator is based on unique hospital admissions and restricted to mortality within the same hospital. Differences in practices in discharging and transferring patients may influence the findings.

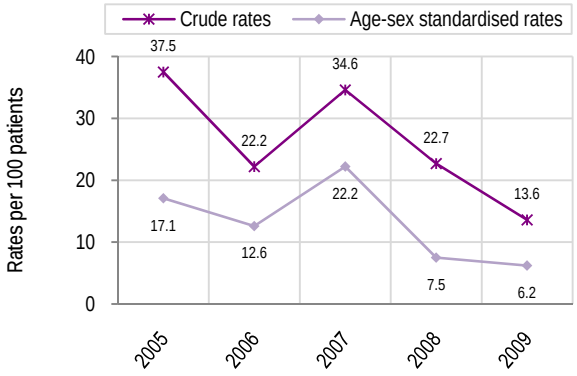
(OECD, 2009, p124)

5.5.1 In-hospital case-fatality crude rates within 30 days after admission for ischemic stroke (BDA)



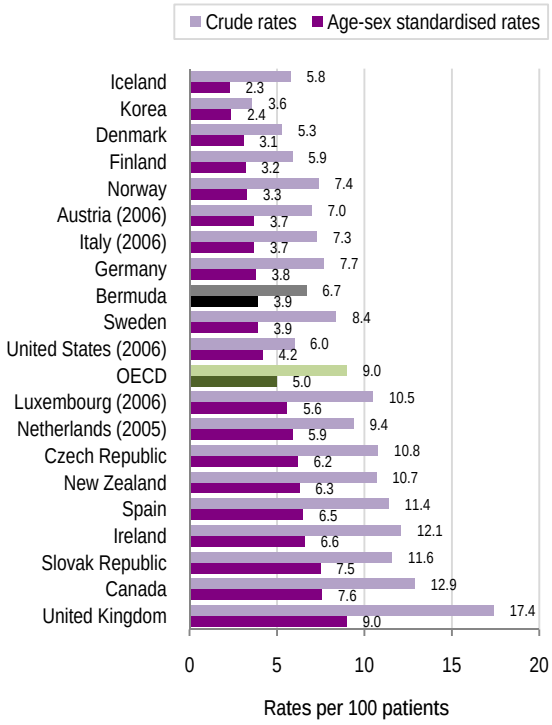
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population (45+).

5.5.2 In-hospital case-fatality crude rates within 30 days after admission for hemorrhagic stroke (BDA)



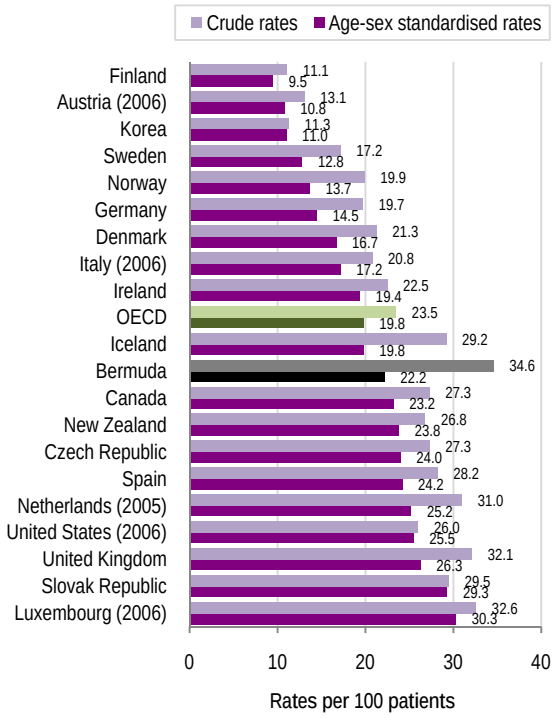
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population (45+).

5.5.3 In-hospital case-fatality rates within 30 days after admission for ischemic stroke, 2007



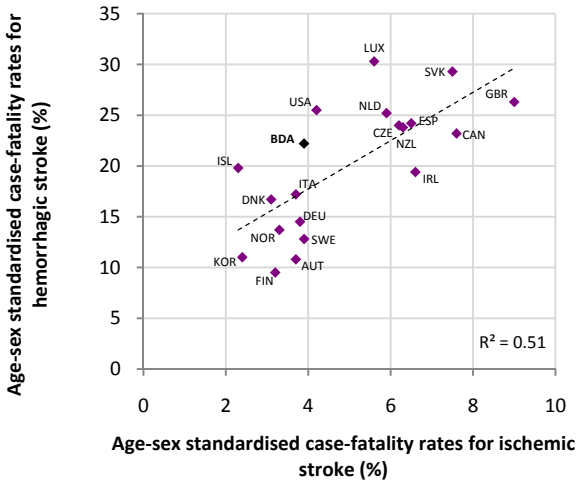
SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population (45+).

5.5.4 In-hospital case-fatality rates within 30 days after admission for hemorrhagic stroke, 2007



SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population (45+).

5.5.5 In-hospital case-fatality rates within 30 days after admission for ischemic and hemorrhagic stroke, 2007



SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population (45+).

Care for Mental Disorders

5.6 Unplanned hospital re-admissions for mental disorders

There are a number of factors which can influence readmissions to hospital for mental disorders. These include the initial length of stay, discharge planning, and the availability of community and outpatient services. Re-admission rates, therefore, are reflective of the overall functioning of mental health services.[54]

There has been a moderate decline in unplanned readmissions for schizophrenia (Figure 5.6.1). This is mainly accounted for by the unplanned schizophrenia readmissions of males in recent years as the rate in females increased over the same period following a few years of decline (Figure 5.6.2). This interpretation should be treated with caution as the annual rates by gender fluctuate during the period under review. The same is true for the unplanned bipolar disorder readmissions in which there was an overall decline (Figure 5.6.3) which again is mainly accounted for by the decline in male readmissions (Figure 5.6.4).

Bermuda's overall rate of unplanned schizophrenia readmissions is comparable to, but slightly above, the OECD average (Figure 5.6.5). However, the gender differences are markedly different from the OECD countries, with the rate for males being higher than all OECD countries and the rate for females being near the lowest of all the countries (Figure 5.6.6). However, it must be noted that the year selected for comparison (2007) was a somewhat anomalous year for Bermuda in which, for the period under review, the rate for males was the highest recorded and the rate for females the lowest. More recent years show a convergence of the male and female rates that is more in accordance with the gender distribution of unplanned schizophrenia readmissions of the OECD countries.

Bermuda's rates for unplanned bi-polar disorder readmissions, overall and gender-specific, are also above the OECD average (Figures 5.6.7 and 5.6.8). These higher than average rates, including the rates for unplanned schizophrenia readmissions, are partly due to the infrastructure and resources available for mental health in Bermuda. There is a lack of community-based group homes which would allow people with mental disorders to transition back into the community following discharge from hospital. However, more are being added. In the 2010 Mental Health Plan, moves were made to introduce more community based treatment with the philosophy of the National Service Framework in the UK. Their readmission rates are much smaller than the OECD average, so it will be relevant to track possible future changes in these figures.

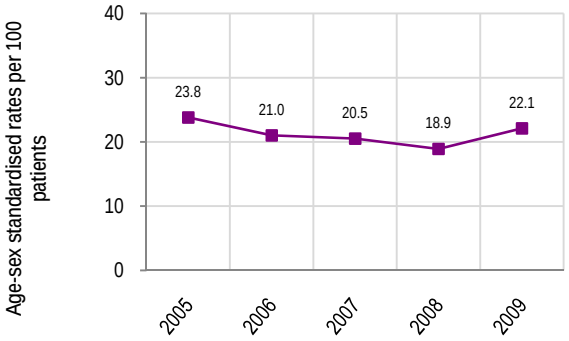
Definition and deviations

The indicator is defined as the number of unplanned re-admissions per 100 patients with a diagnosis of schizophrenia and bipolar disorder per year. The denominator is comprised of all patients with at least one admission during the year for the condition. A re-admission is considered unplanned when the patient is admitted for any mental disorder to the same hospital within 30 days of discharge. Same-day admissions (less than 24 hours) are excluded.

The absence of unique patient identifiers in many countries does not allow the tracking of patients across facilities. Rates are, therefore, biased downwards as re-admissions to a different facility cannot be observed. However, the eight countries which were able to estimate re-admission rates to the same or other hospitals show that rates based on the two different specifications were closely correlated and ranking of countries was similar. This suggests that re-admissions to the same hospital can be used as a valid approximation.

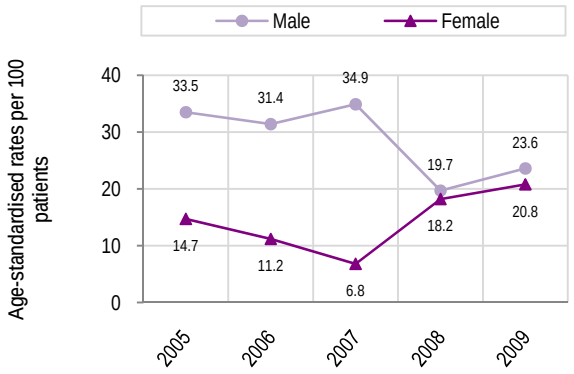
(OECD, 2009, p126)

5.6.1 Unplanned schizophrenia re-admissions to the same hospital, total (BDA)



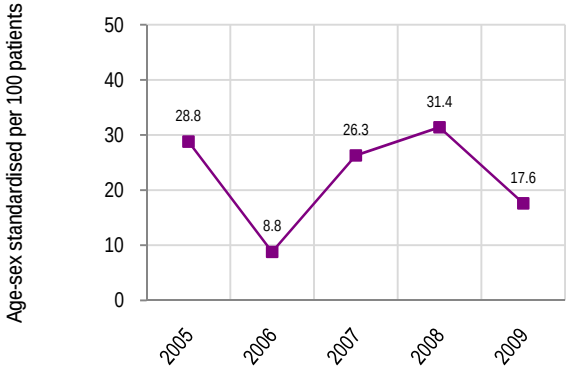
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.6.2 Unplanned schizophrenia re-admissions to the same hospital , by gender (BDA)



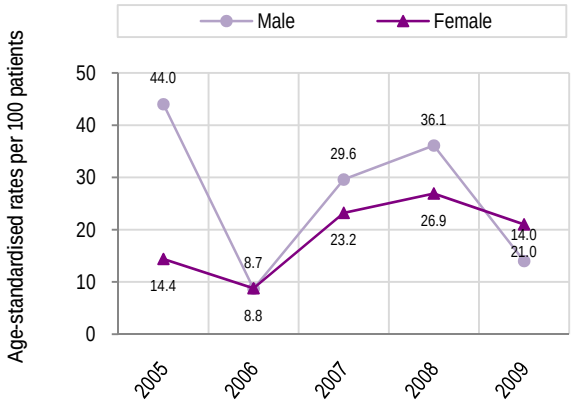
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.6.3 Unplanned bipolar disorder re-admissions to the same hospital, total (BDA)



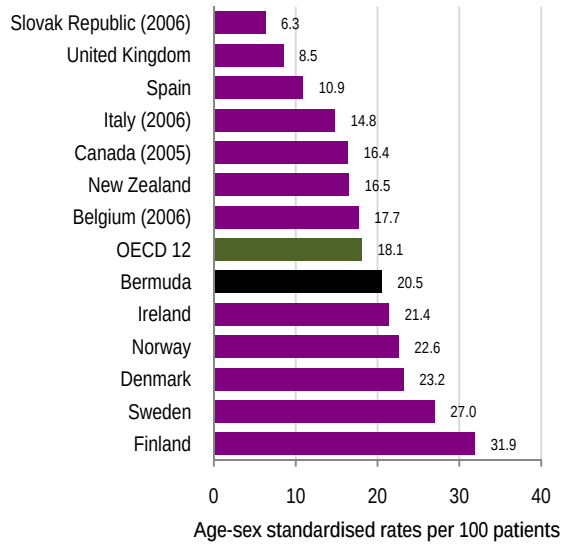
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.6.4 Unplanned bipolar disorder re-admissions to the same hospital, by gender (BDA)



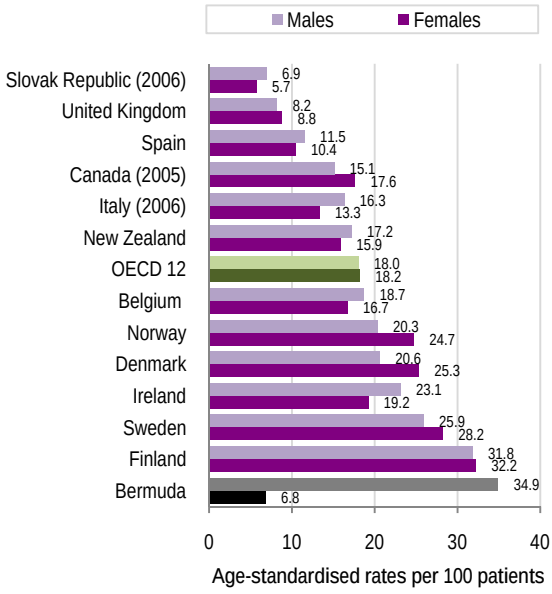
SOURCE: Bermuda Hospitals Board. Rates are age-sex standardised to 2005 OECD population.

5.6.5 Unplanned schizophrenia re-admissions to the same hospital, total, 2007



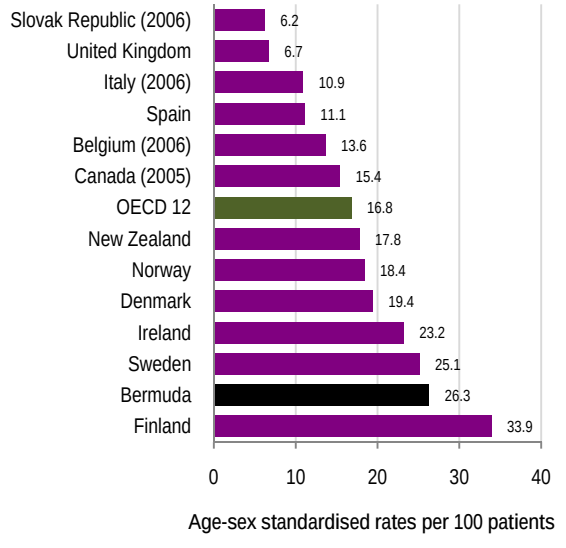
SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

5.6.6 Unplanned schizophrenia re-admissions to the same hospital, by gender, 2007



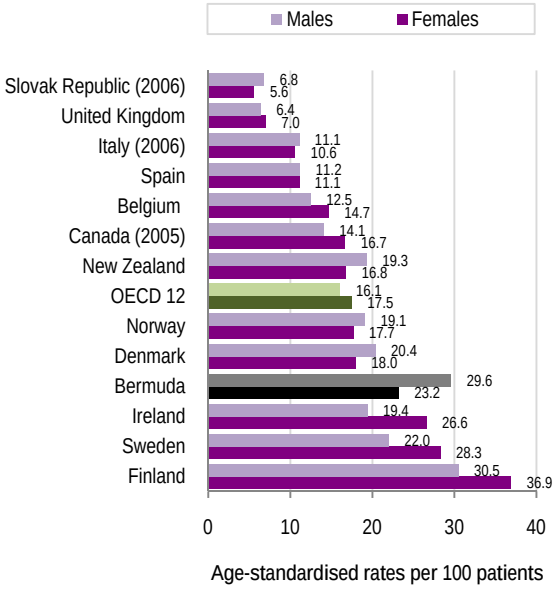
SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

5.6.7 Unplanned bipolar disorder re-admissions to the same hospital, total, 2007



SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

5.6.8 Unplanned bipolar disorder re-admissions to the same hospital, by gender, 2007



SOURCE: OECD Health Care Quality Indicators Data 2009. Rates are age-sex standardised to 2005 OECD population.

Cancer Care

5.7 Screening and mortality for cervical cancer

Among all malignant tumours, cervical cancer is the one that can be most effectively controlled by screening. Early detection of pre-cancerous cells and subsequent treatment can prevent the development of cervical cancer. As cancer of the cervix can have a long latency period, years might pass before changes in behaviour or clinical practice affect mortality rates. Information collected on screening is therefore more useful than mortality data in assessing the effectiveness of cervical cancer prevention programmes.

Figure 5.7.1 shows the cervical cancer mortality rate from 2000 to 2007. It can be seen that although cervical cancer is not a common cause of death in Bermuda, there is a wide variation in the annual rate. Given this variation, it is difficult to determine a trend. To modify the effect of the variations, five-year averages were used to compare Bermuda's cervical cancer mortality rates to the OECD countries (Figure 5.7.3). This method shows that for most years, Bermuda compared favourably to the OECD countries at well below the OECD average.

Figure 5.7.2 shows the cervical cancer screening rates for 2006. Cervical cancer screening rates are very high in Bermuda, significantly above the OECD average, and are comparable to the rates in the United States and United Kingdom. Comparing Bermuda only to the OECD countries that used surveys to determine screening rates, Bermuda has the highest rates.

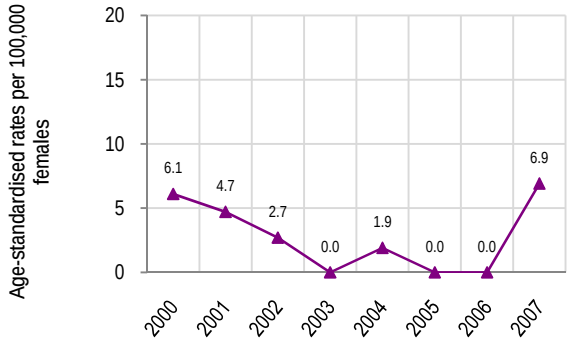
Definition and deviations

Screening rates for cervical cancer reflect the proportion of patients who are eligible for a screening test and actually receive the test. Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database. See indicator 1.8 "Mortality from cancer" for definition, source and methodology underlying the cancer mortality rates.

As policies regarding screening periodicity differ across countries, the rates are based on each country's specific policy. An important consideration is that some countries ascertain screening based on surveys and others based on encounter data, which may influence the results. If a country has an organised screening programme, but women receive care outside the programme, rates may be underreported. Survey-based results may also underestimate the rates due to recall bias.

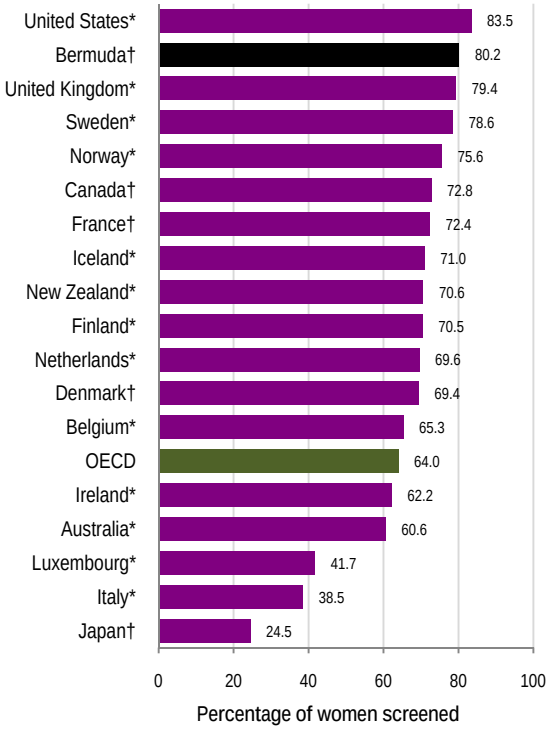
(OECD, 2009, p128)

5.7.1 **Cervical cancer mortality, females** (BDA)



SOURCE: Department of Health, Government of Bermuda. Rates are age standardised to 1980 OECD population.

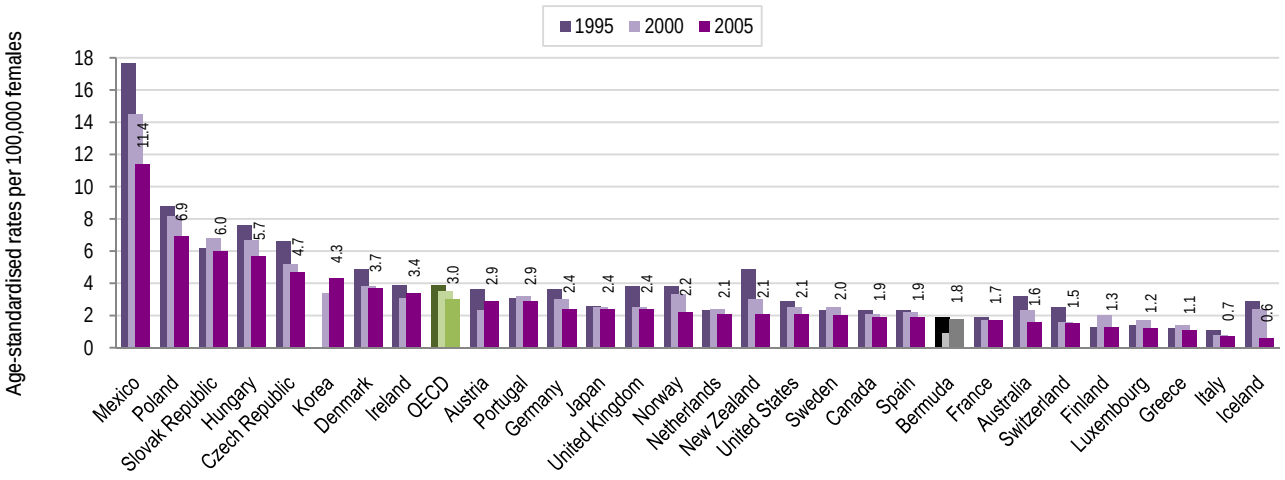
5.7.2 **Cervical cancer screening, percentage of females screened aged 20-69, 2006** (or nearest year)



* Programme † Survey

SOURCE: OECD Health Data 2009 (cancer screening; mortality data extracted from WHO Mortality Database and age standardised to 1980 OECD population).

5.7.3 **Cervical cancer mortality, females, 1995 to 2005** (or nearest year)



SOURCE: OECD Health Data 2009 (cancer screening; mortality data extracted from WHO Mortality Database and age standardised to 1980 OECD population). **NOTE:** Bermuda data shows a five year average of 2001-05, 2002-06, and 2003-07.

5.8 Screening and mortality for breast cancer

Mammography screening leading to early detection and treatment of breast cancer can reduce breast cancer deaths. Mortality from breast cancer is therefore an indicator of the effectiveness of screening and treatment. As breast cancer can have a long latency period, years might pass before changes in behaviour or clinical practice affect population mortality.

Mortality rates from breast cancer have generally declined in Bermuda (Figure 5.8.1). Although they remain above the OECD average, the rate of decline appears to be more rapid in Bermuda than in the OECD countries (Figure 5.8.3). Bermuda's mammography screening rates are well above the OECD average (Figure 5.8.2). The impact of the high mammography screening rates should be seen in further reductions in breast cancer mortality in the future due to the time lag between diagnosis and death and the development of improved treatments. Accordingly, the current mortality rates are reflective of the screening rates and treatment available in prior years, which are not presented here.

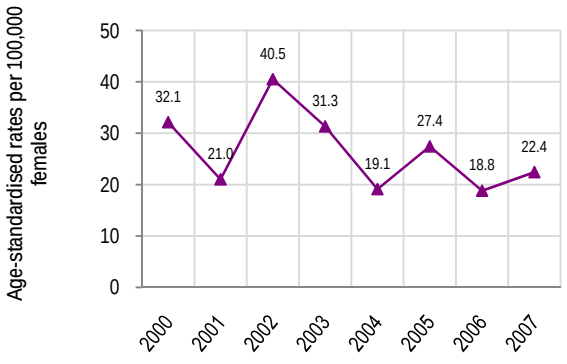
Definition and deviations

Mammography screening rates reflect the proportion of eligible female patients who are actually screened. As policies regarding target age groups and screening periodicity differ across countries, the rates are based on each country's specific policy. Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database.

As policies regarding target age groups and screening periodicity differ across countries, the rates are based on each country's specific policy. Some countries ascertain screening based on surveys and others based on encounter data and this may influence results. If a country has an organised screening programme, but women receive care outside of the programme, rates may be underreported. Survey-based results may also underestimate rates due to recall bias.

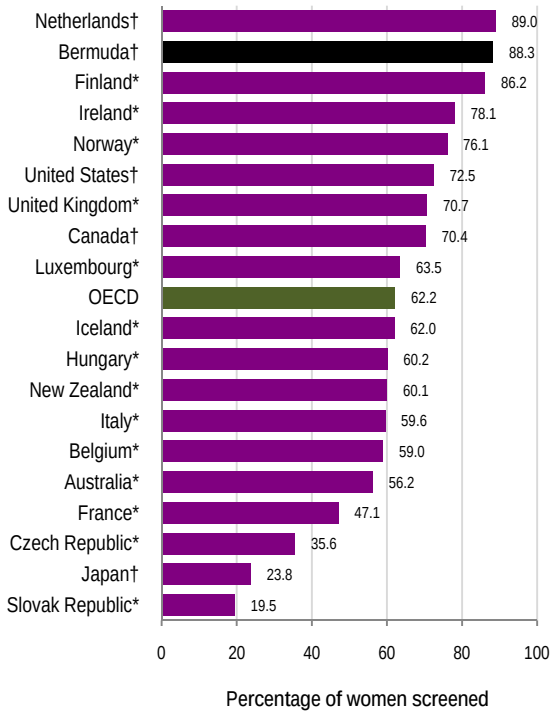
(OECD, 2009, p130)

5.8.1 **Breast cancer mortality, females** (BDA)



SOURCE: Department of Health, Government of Bermuda. Rates are age standardised to 1980 OECD population.

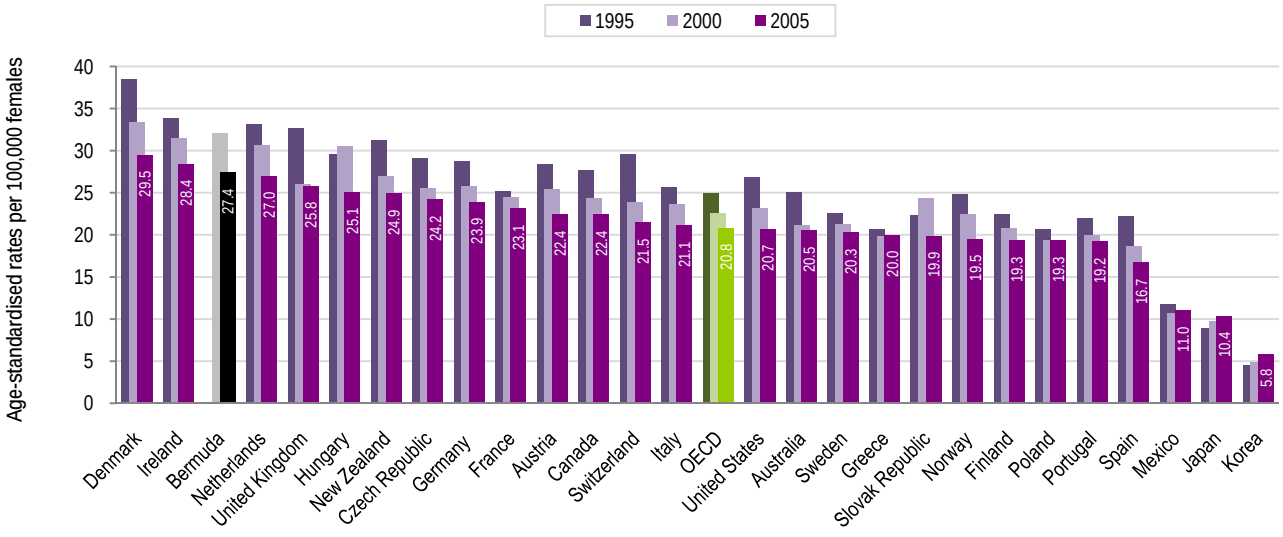
5.8.2 **Mammography screening, percentage of women screened aged 50-69, 2006** (or nearest year)



* Programme † Survey

SOURCE: OECD Health Data 2009 (cancer screening; mortality data extracted from WHO Mortality Database and age standardised to 1980 OECD population).

5.8.3 **Breast cancer mortality, females, 1995 to 2005** (or nearest year)



SOURCE: OECD Health Data 2009 (cancer screening; mortality data extracted from WHO Mortality Database and age standardised to 1980 OECD population).

5.9 Mortality from colorectal cancer

Mortality from colorectal cancer is an indicator of the underlying prevalence of colorectal cancer in the population and the effectiveness of screening and treatment. Early detection with stool occult blood testing and sigmoidoscopy/colonoscopy, treatment of precancerous lesions, and treatment in the early stages of cancer decrease mortality from colon and rectum cancer. Physical activity, healthy diet, and avoidance of overweight might reduce risk. Because colon and rectum cancer have a long latency period, years might pass before changes in behaviour or clinical practice patterns affect population mortality.

While mortality rates from colorectal cancer have fluctuated over the years, they remain low compared to the OECD countries (Figures 5.9.1 and 5.9.2). This demonstrates physician and patient compliance with standard screening and treatment recommendations.

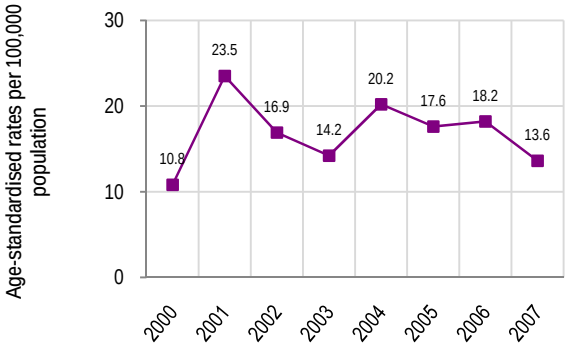
As Bermuda's data did not include the colorectal cancer mortality rate for 1995, the ten-year difference cannot be ascertained. Additionally, the 2000 base year used for Bermuda's comparison was a year with an unusually low colorectal cancer mortality rate.

Definition and deviations

Mortality rates are based on the crude number of deaths according to selected causes in the WHO Mortality Database. Mortality rates presented here vary from the ICD 10 definition of colorectal cancer employed in *Health at a Glance 2007* by also including anal cancer.

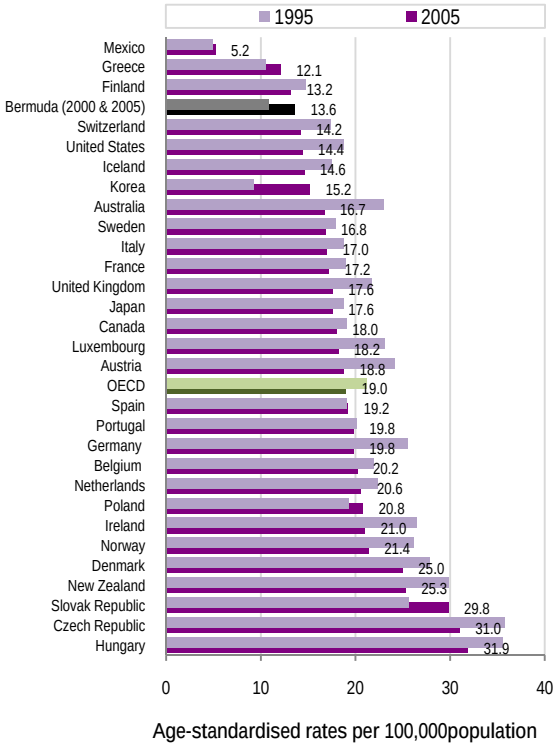
(OECD, 2009, p132)

5.9.1 **Colorectal cancer mortality** (BDA)



SOURCE: Bermuda Hospitals Board. Rates are age standardised to 1980 OECD population.

5.9.2 **Colorectal cancer mortality, 1995 to 2005** (or nearest year)



SOURCE: OECD Health Data 2009 (mortality data extracted from WHO Mortality Database and age standardised to 1980 OECD population).

Care for Communicable Diseases

5.10 Childhood vaccination programmes

Immunisation is essential for reducing morbidity and mortality associated with vaccine-preventable diseases. Vaccination rates are used to monitor coverage of immunisation programmes and to guide disease eradication and elimination efforts. Vaccination rates under 100% do afford protection to the population due to the effect of herd immunity. Childhood vaccination rates are therefore good indicators of health system performance.

Figure 5.10.1 shows the vaccination rates for pertussis, measles, and hepatitis B for children aged two years. There have been fluctuations in the vaccination rates for pertussis, measles, and hepatitis B, but all have remained relatively high. There was a decline in the measles vaccination rate in 2006 possibly due to public concerns internationally regarding the erroneously alleged link between the MMR (measles-mumps-rubella) vaccine and autism; however, since then measles vaccination rates have steadily increased. Hepatitis B vaccine uptake has not been as high as the other immunisations; however, this is not necessarily related to the fluctuating incidence of hepatitis B in the population - these cases have been in older adults, not mothers and children (Figure 5.10.2).

Vaccination rates for diphtheria, pertussis (whooping cough) and tetanus (DPT) and polio under 1 year of age have been consistently high (Figure 5.10.3).

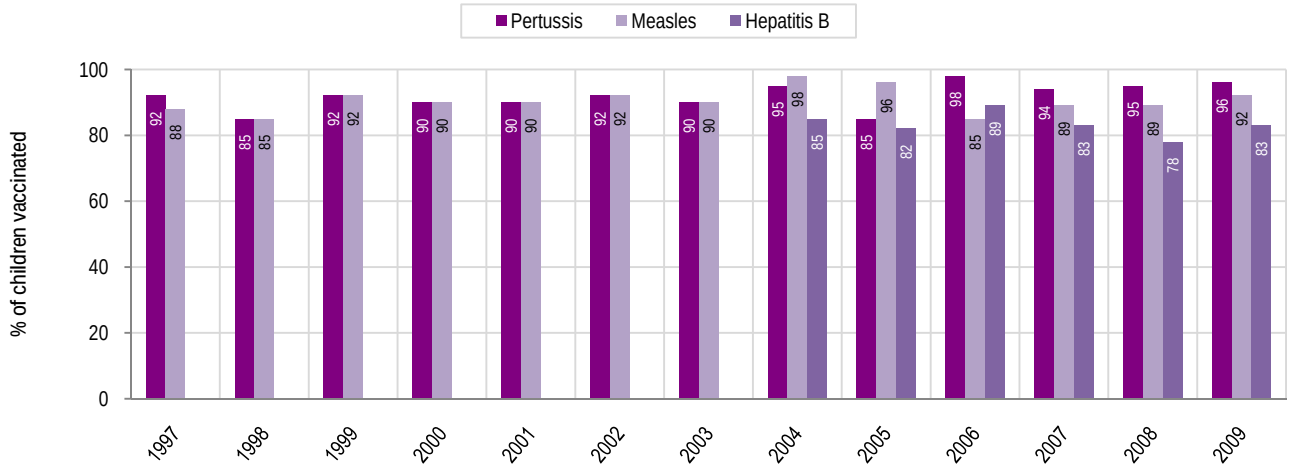
Vaccination rates for pertussis are on par with the OECD average, while rates for measles are lower and rates for hepatitis B are lower still (Figures 5.10.4, 5.10.5 and 5.10.6). The incidence of hepatitis B is higher than the OECD average (Figure 5.10.7). This may be the result of persons with long-standing chronic infection being detected in recent years due to increased testing.

Definition and deviations

Vaccination rates indicate the percentage of children at the appropriate age that have received the respective vaccination in the recommended timeframe. Childhood vaccination policies differ slightly across countries. Thus, these indicators are based on the actual policy in a given country.

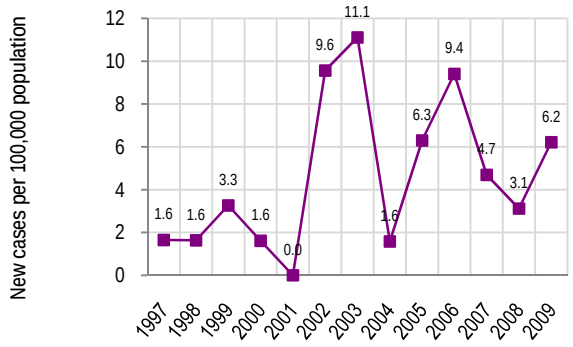
(OECD, 2009, p134)

5.10.1 Vaccination rates for pertussis, measles, and hepatitis B, children aged 2 (BDA)



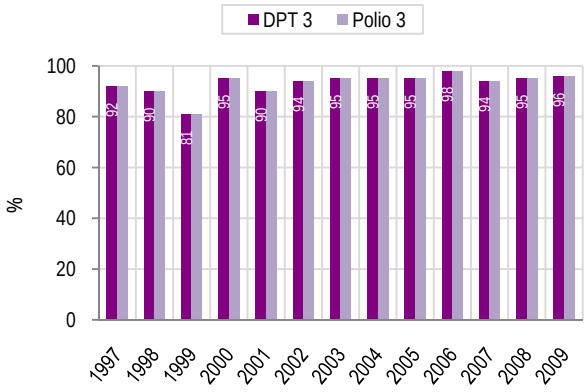
SOURCE: Department of Health, Government of Bermuda

5.10.2 Incidence of hepatitis B, total population (BDA)



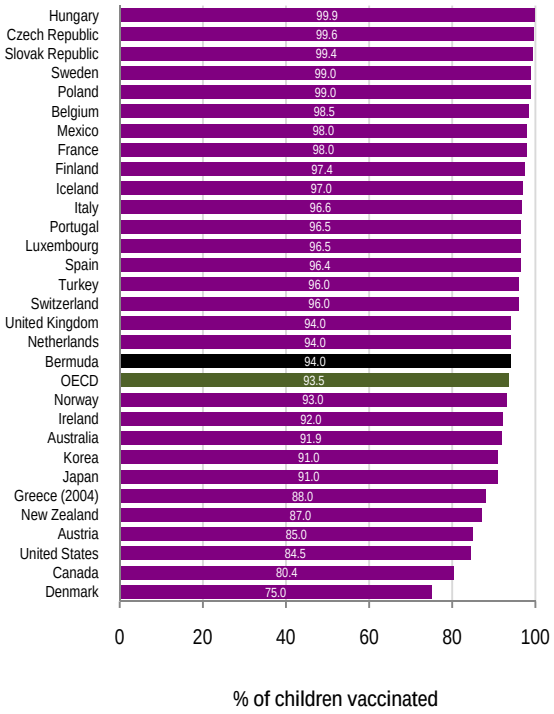
SOURCE: Department of Health, Government of Bermuda

5.10.3 Immunisation coverage of DPT3 and Polio (under 1 year of age) (BDA)



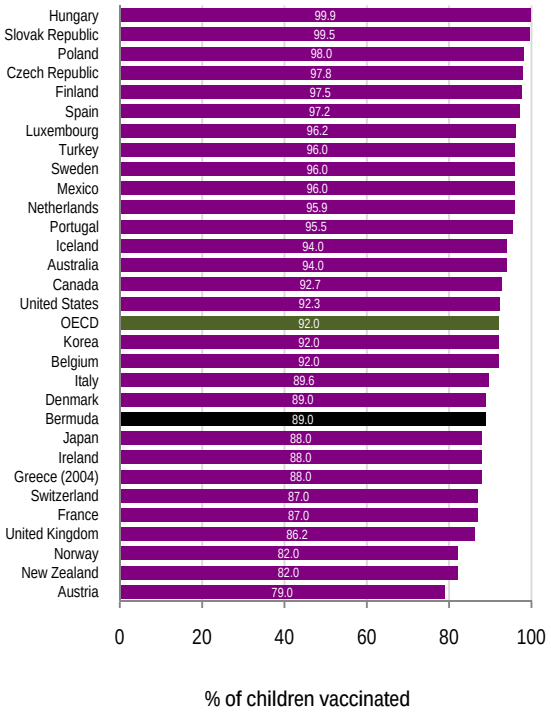
SOURCE: Department of Health, Government of Bermuda

5.10.4 Vaccination rates for pertussis, children aged 2, 2007 (or latest year available)



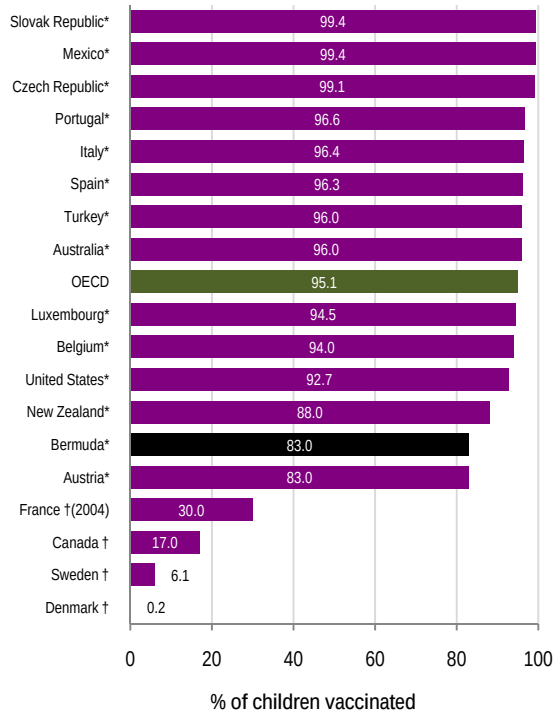
SOURCE: OECD Health Data 2009

5.10.5 Vaccination rates for measles, children aged 2, 2007 (or latest year available)



SOURCE: OECD Health Data 2009

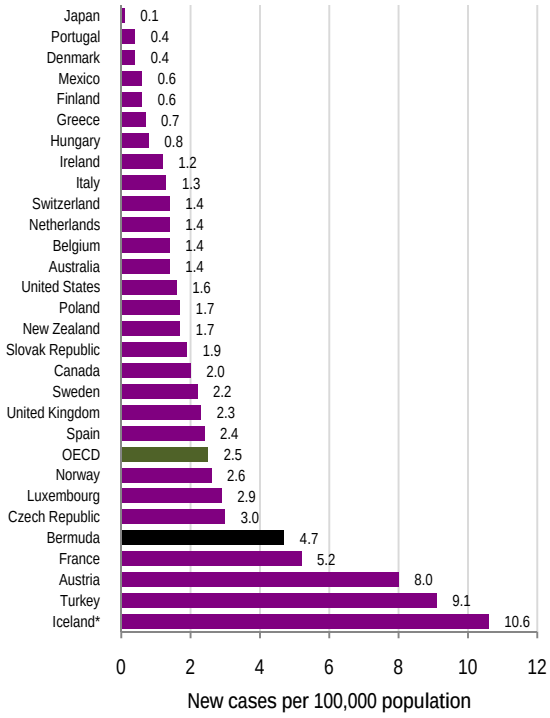
5.10.6 Vaccination rates for hepatitis B, children aged 2, 2007 (or latest year available)



†Not required and/or not routinely provided by age 2. *Required and/or routine immunisation.

SOURCE: OECD Health Data 2009

5.10.7 Incidence of hepatitis B, total population, 2007 (or latest year available)



*Based on a three-year average.

SOURCE: OECD Health Data 2009

5.11 Influenza vaccination for elderly people

Vaccination of persons at risk for complications from influenza, especially the elderly and persons with chronic health conditions, is important for reducing the associated morbidity and mortality. This indicator is also reflective of the acceptance of preventive health services by patients and health practitioners, public awareness of vaccination programmes and availability of vaccine.

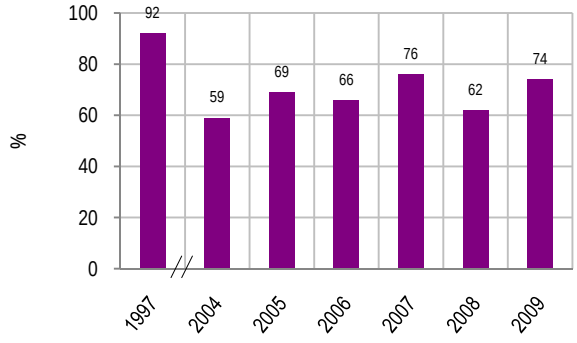
Figure 5.11.1 shows the proportion of persons aged 65 years and older who were vaccinated for influenza. The high vaccination rate in 1997 and the lower rate in 2004 are both associated with vaccine supply. There was an increased demand for influenza vaccination in 1997, as there had been a worldwide shortage of vaccine in previous years. With another worldwide vaccine shortage in 2004, the vaccine was not highly promoted due to the uncertainty of availability in Bermuda. The limited promotion resulted in limited uptake. Since then, rates have been higher but varying by year. Bermuda's 65+ influenza vaccination rates have fluctuated but remain higher than the OECD average (Figure 5.11.2 and 5.11.3).

Definition and deviations

Influenza vaccination rate refers to the number of people aged 65 and older who have received an annual influenza vaccination, divided by the total number of people over 65 years of age. The main limitation in terms of data comparability arises from the use of different data sources, whether survey or programme, which are susceptible to different types of errors and biases. For example, data from population surveys may reflect some variation due to recall errors and irregularity of administration.

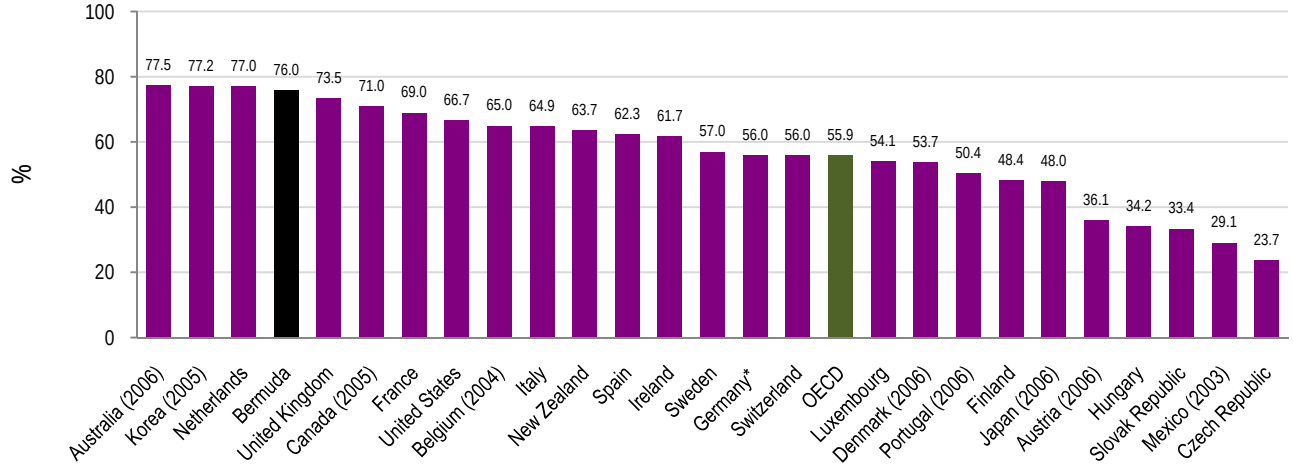
(OECD, 2009, p136)

5.11.1 Influenza vaccination coverage, population aged 65 and over (BDA)



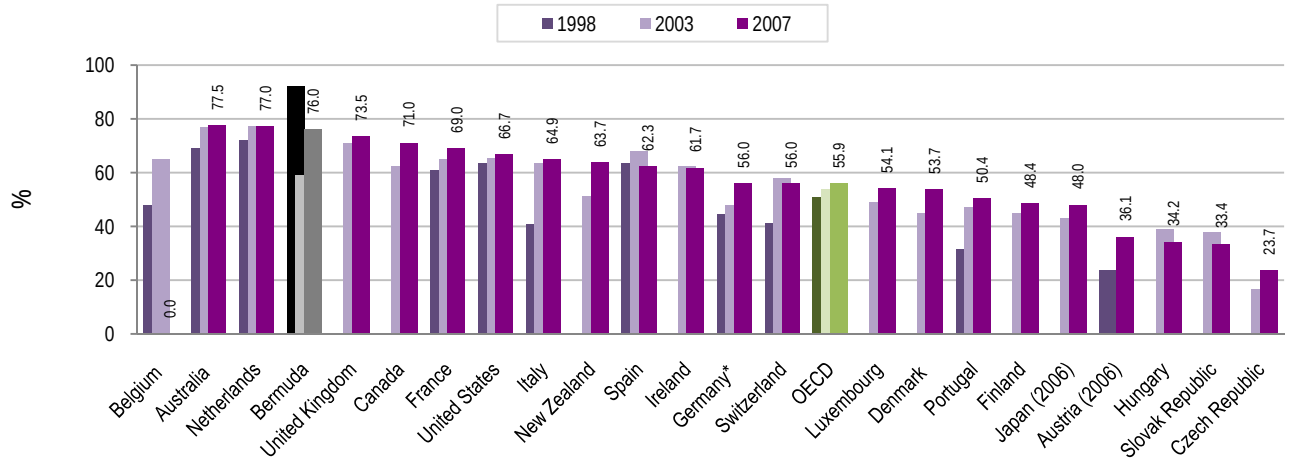
SOURCE: Department of Health, Government of Bermuda

5.11.2 Influenza vaccination coverage, population aged 65 and over, 2007 (or latest year available)



SOURCE: OECD Health Data 2009

5.11.3 Influenza vaccination coverage, population aged 65 and over, 1998 - 2007 (or nearest year available)



SOURCE: OECD Health Data 2009

6. ACCESS TO CARE

6.1 Unmet healthcare needs

Self-reported unmet need for healthcare is an indicator for equity of access to healthcare services. It gives insight into the need for care and the obstacles that stand in the way of the actual use of healthcare services. This indicator therefore provides useful information on how to overcome the obstacles for use and improve health.[55]

Although the majority of the population reported that their healthcare needs were being met, 11% reported some unmet need (Figure 6.1.1). The most common reasons given for unmet medical care was inadequate insurance coverage followed by lack of specialist care and facilities locally (Figure 6.1.2). Figure 6.1.3 shows the reasons for unmet healthcare need by broad categories of household income. Those respondents with a household income of less than BDA $50,000 were more likely to report unmet need due to lack of insurance coverage and those with a household income of BDA $100,000 plus were more likely to report unmet need due to lack of specialist care and facilities locally. Some respondents in these income groups also reported a perception that care in Bermuda was low-quality or not up-to-date. Respondents with the median income category of BDA $50,000 – $100,000 were split about evenly between both of the fore-mentioned reasons. Interestingly, only the middle income bracket reported lack of government assistance as a barrier to healthcare needs. In seven OECD countries for which data is available the difference between income levels in unmet care need due to cost varied, with the UK having the lowest disparity between above average and below average income levels (8% vs. 9%, respectively), and the US having the highest (25% vs. 52%) (Figure 6.1.4). Bermuda data indicates significant income differences in reporting of unmet healthcare needs due to cost, with 27% for above average income earners, and 65% for below average income earners.

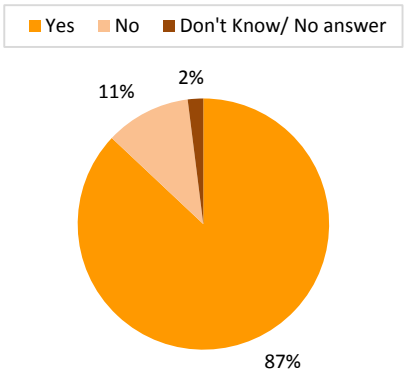
Definition and deviations

In order to determine unmet medical care, individuals are typically asked questions to determine whether there was a time in the previous 12 months when they felt they needed healthcare services but did not receive them, followed by a question to determine why the need for care was unmet.

Information on both unmet care and socioeconomic status are derived from the same survey, although specific questions and answers, along with age groups surveyed and the measures used to grade socio-economic status can vary across surveys and countries. The differences in the survey question between Bermuda and the OECD countries allow for limited comparisons.

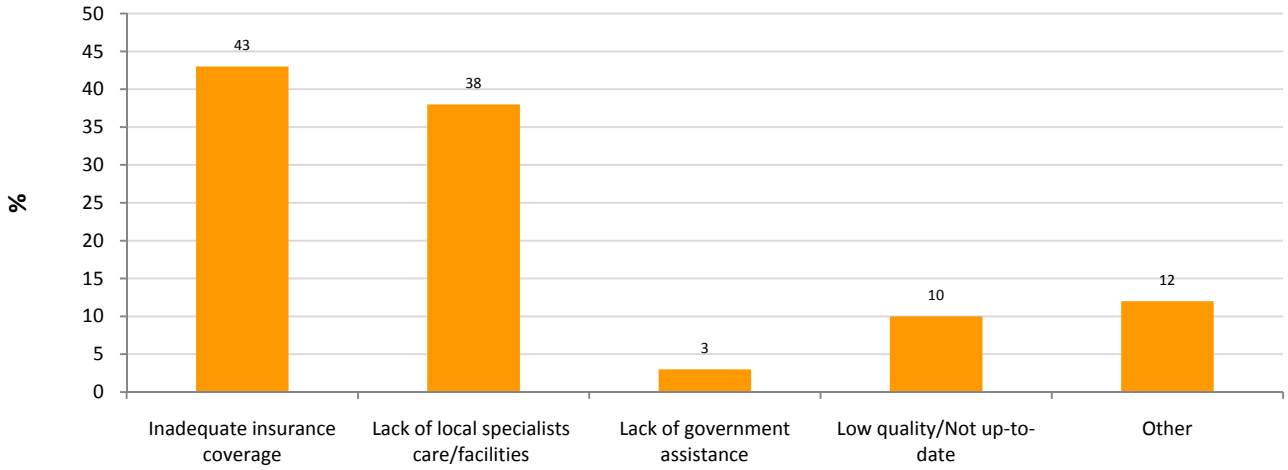
(OECD, 2009, p142)

6.1.1 Healthcare needs being met, 2005 (BDA)



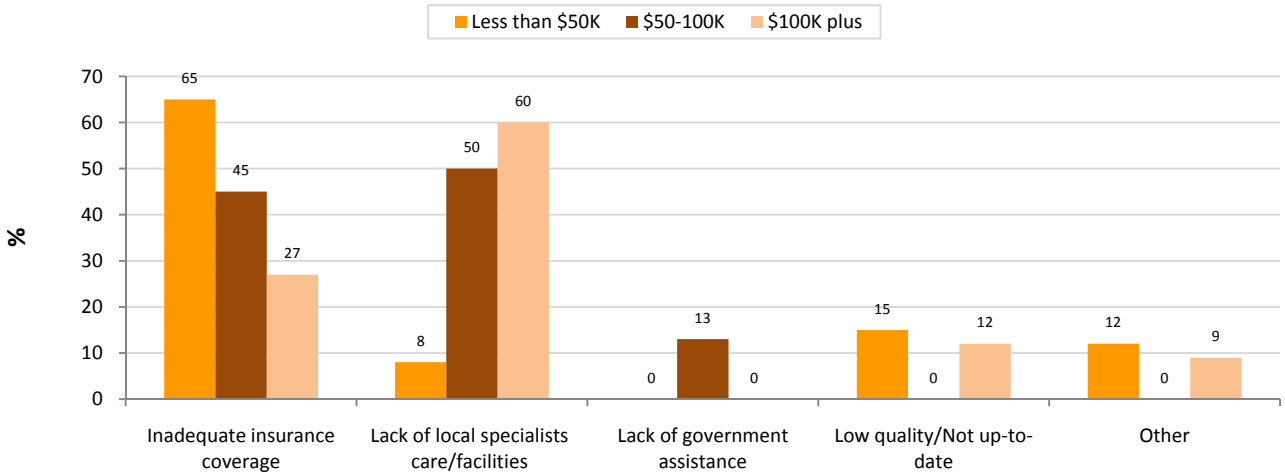
SOURCE: Bermuda Government Ministry of Health & Family Services 2005 Public Perception Study Final Report

6.1.2 Selected reasons for unmet healthcare needs, 2005 (BDA)



SOURCE: Bermuda Government Ministry of Health & Family Services 2005 Public Perception Study Final Report. **NOTE:** Results show condensed categories from the original report.

6.1.3 Selected reasons for unmet healthcare needs, by income, 2005 (BDA)



SOURCE: Bermuda Government Ministry of Health & Family Services 2005 Public Perception Study Final Report. **NOTE:** Results show condensed categories from the original report.

6.1.4 Unmet care need* due to costs, by income group, 2007

*Did not get medical care, missed medical test, treatment or follow-up, did not fill prescription or missed doses.
SOURCE: Commonwealth Fund (2008). **NOTE:** The Bermuda Government Ministry of Health & Family Services 2005 Public Perception Study Final Report asked participants "Why do you believe your current healthcare needs are NOT being met?" Results shown here were condensed from categories in the original report which reflect cost issues (i.e. "high insurance rates", "inadequate insurance coverage", and "too expensive/ cost of healthcare"). The Bermuda income categories have defined annual household income of BDA $100,000 or above as “above average”, and BDA $50,000 or less as “below average”.

6.2 Burden of out-of-pocket health expenditure

Out-of-pocket spending on health is an important indicator of health system performance because of the financial risk it can present for households and individuals. Out-of-pocket expenditure refers to direct payments for health goods and services. These payments include charges, co-payments, and deductibles. It does not include payments that the individual may recover from their insurer. Without adequate coverage households are at risk of incurring high and potentially catastrophic healthcare expenditures, which can force them into poverty. High out-of-pocket payments can also result in people not seeking care when they need it, or forgoing medical treatment altogether.[56]

In Bermuda it is estimated that out-of-pocket expenditure represented less than 2.6% of final household consumption between 2003 and 2007 (Figure 6.2.1). In 2008 this went up to 2.9%, indicating an increased burden on households. The 2007 figure compares favourably to the OECD average of 3.0% (Figure 6.2.2). In this regard, Bermuda is similar to the US and Canada (2.8%), but compares poorly to the UK where the burden on households is 1.6%. In contrast, in Switzerland 5.9% of households consumption was on out-of-pocket payments. There is no publicly available data on the extent to which Bermuda households are affected by catastrophic health expenditure.

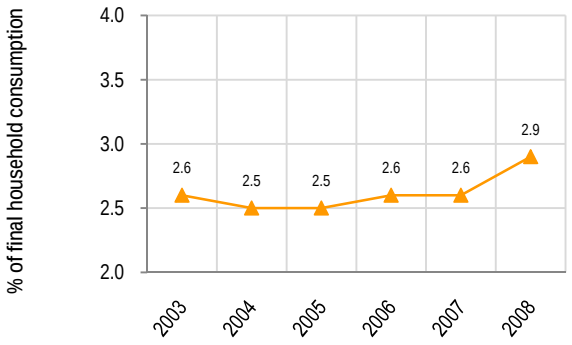
Definition and deviations

The World Health Organisation defines household out-of-pocket spending as the direct outlays of households, including gratuities and in-kind payments made to health practitioners and to suppliers of pharmaceuticals, therapeutic appliances and other goods and services. This includes household direct payments to public and private providers of health-care services, non-profit institutions, and non-reimbursable cost-sharing, such as deductibles, co-payments and fees for services (WHO, 2003a).

The OECD defines out-of-pocket payments as expenditures borne directly by a patient where insurance does not cover the full cost of the health good or service. They include cost-sharing, self-medication and other expenditure paid directly by private households. Some households face very high out-of-pocket payments. In some countries they also include estimations of informal payments to healthcare providers. Some households face very high out-of-pocket payments. Catastrophic health expenditure is commonly defined as payments for health services exceeding 40% of household disposable income after subsistence needs are met. Information on out-of-pocket expenditure is collected through household expenditure surveys in a number of OECD countries.

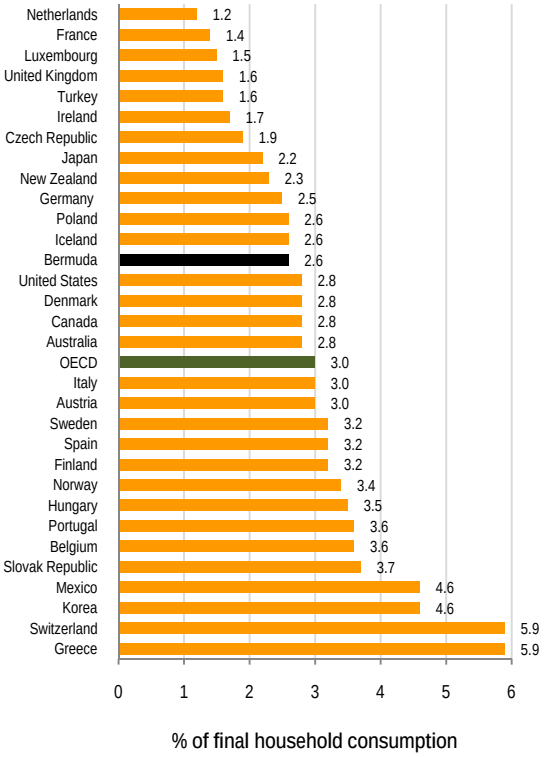
(OECD, 2009, p146)

6.2.1 Out-of-pocket expenditure as a share of final household consumption (BDA)



SOURCE: National Health Accounts Report 2010 and Department of Statistic, Government of Bermuda

6.2.2 Out-of-pocket expenditure as a share of final household consumption, 2007 (or nearest available year)



SOURCE: OECD Health Data 2009

6.3 Inequalities in doctor consultations

Differences in doctor consultations by income indicate whether or not cost is a barrier to the utilisation of health services. As people with low income may have equal or greater need of health services, decreased utilisation of health services may increase these needs resulting in greater inequalities.

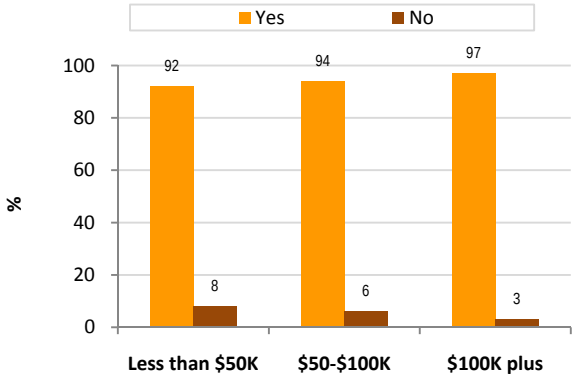
The percentage of people visiting a doctor in the past twelve months increased, although slightly, with income level (Figure 6.3.1). Figure 6.3.2 shows the percentage of persons visiting a specialist in the past 12 months. The same slight increase is seen from the low to the middle income group, but persons with a household income of BDA $100,000 plus were much more likely to have seen a specialist. This is similar to the trend in countries where private insurance coverage is high and patients are able to access specialists directly.

Definition and deviations

In the Ministry of Health and Family Services' "2005 Public Perception Study", participants were asked: "Within the past 12 months have you or a member of your immediate household visited a family doctor?" and "Within the past 12 months have you or a member of your immediate household visited a specialist?" (See 4.1 Consultations with doctors). Using this same data, results are presented according to household income groups in order to identify any inequalities.

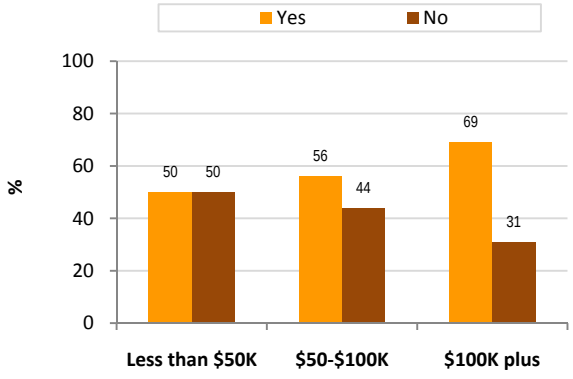
The OECD indicator differs from that provided by the Ministry of Health and Family Services' study, in which consultations with doctors refer to the number of ambulatory contacts with physicians (both generalists and specialists) (OECD, 2009, p150). Therefore comparisons to OECD countries cannot be made.

6.3.1 Percentage of people visiting family doctor in past 12 months, by income, 2005 (BDA)



SOURCE: Ministry of Health and Family Services 2005 Public Perception Study

6.3.2 Percentage of people visiting specialist in past 12 months, by income, 2005 (BDA)



SOURCE: Ministry of Health and Family Services 2005 Public Perception Study


ANEROID SPHYGMOMANOMETER
mmHg
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300

6.4 Inequalities in dentist consultations

Often times it is early detection of a disease that saves a person's life. Through comprehensive oral exams, dentists can identify signs of nutritional deficiencies and numerous other general diseases such as oral cancer, microbial infections, immune disorders, and injuries. Poor oral health can have a significant impact on general health. Additionally, there is a strong link between some oral diseases and chronic diseases (e.g. diabetes, cardiovascular diseases, chronic obstructive pulmonary diseases and cancer). These diseases tend to have shared preventable risk factors which are associated with lifestyles.[57, 58]

Although oral health has improved within numerous countries over the years, it remains a global issue – even more so for the underprivileged, whether in developing or developed countries. Studies have demonstrated that in most industrialised countries "traditional treatment" of oral diseases is the fourth most costly disease to treat.[59]

In Bermuda, the proportion of persons in the lowest income group who visited a dentist in the previous year was much lower than the proportion of persons in the middle and high income groups (Figure 6.4.1). This shows a correlation between persons of low income and a low consultation rate, which may suggests that cost is a barrier to obtaining dental care. However, definitive conclusions cannot be drawn until further research is conducted. This correlation may be a result of negative attitudes towards home care and professional treatment by those with a low income. At the time of the survey, more persons in Bermuda had medical insurance than dental insurance. The Bermuda Government's Health Insurance Plan introduced dental coverage in 2008. Future surveys will show the resulting impact of increased dental coverage on current inequalities in dentist consultations.

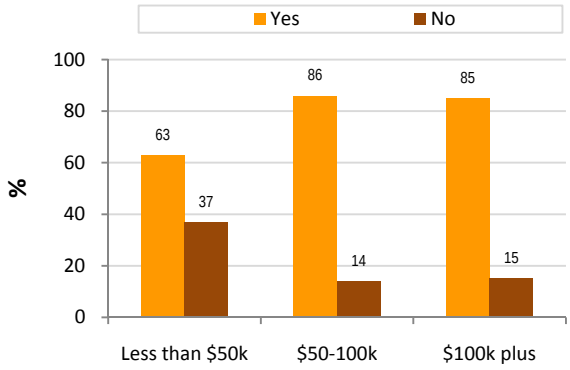
Although Bermuda uses a differently calculated indicator, it is evident that the dental consultation variation by income is similar to the variation in the represented OECD countries (Figure 6.4.2).

Definition and deviations

In the Ministry of Health and Family Services 2005 Public Perception Study, participants were asked, 'Within the past 12 months have you or a member of your immediate household visited a dentist?' Results are presented according to household income groups in order to identify any inequalities.

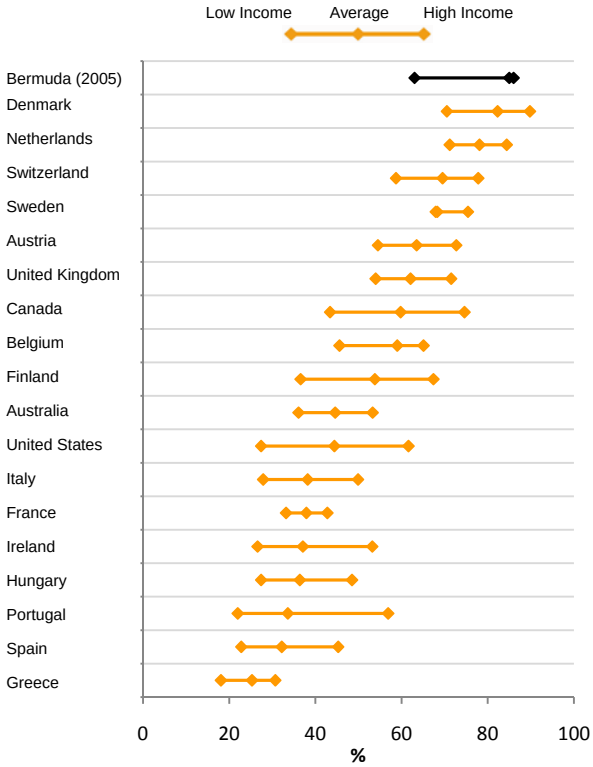
The OECD indicator differs from that provided above in which consultations with dentists refer to the probability and the number of contacts with dentists. Estimates usually come from health interview or household surveys, and rely on self-report, although some countries provide administrative data. Inequalities in dental consultations are here assessed in terms of people's income (OECD, 2009, p152).

6.4.1 Percentage of residents visiting a dentist in past 12 months, by income group, 2005 (BDA)



SOURCE: Ministry of Health and Family Services 2005 Public Perception Study

6.4.2 Probability of a dental visit in the past 12 months, by income group, 2000 (or latest year available)



SOURCE: Van Doorslaer et al. (2004)

6.5 Inequalities in cancer screening

Given the importance of screening for breast and cervical cancers in reducing associated morbidity and mortality and that risks for these cancers, especially cervical cancer, may differ by socioeconomic status, this indicator is important for evaluating participation in screening initiatives by income.

Cervical cancer screening participation rates increased markedly with increasing household income (Figure 6.5.1). This may be related to insurance coverage and/or physician use patterns, e.g. persons with lower income tend to use physicians for curative care rather than preventive care. Another factor for lower rates may be the nature of cervical screening, which is more invasive than screening methods for other forms of cancer. In comparison with selected OECD countries, Bermuda's cervical cancer screening rates were higher and the inequalities were narrower than most countries, except the UK, Italy and the Czech Republic (Figure 6.5.3).

Breast cancer screening participation rates also increased with household income, although the increase was not as marked (Figure 6.5.2). Bermuda's rates across the income categories were among the highest of the represented countries, and show the lowest level of income inequality (Figure 6.5.4)

Definition and deviations

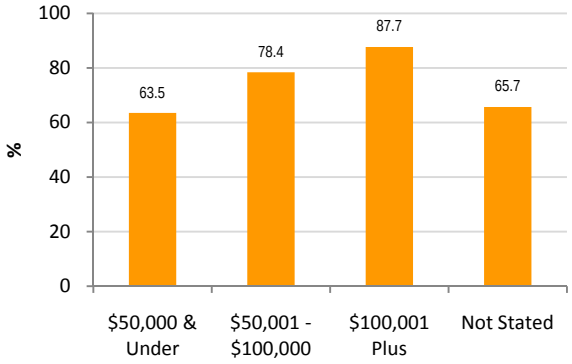
Breast and cervical screening participation rates measure the proportion of females, of a given age, who have received a recent mammogram, breast exam, pap smear, or pelvic exam. Information is generally derived from health surveys or from the screening programme administrative data (OECD, 2009, p154).

There are slight differences in the way data was gathered between Bermuda and OECD countries. For OECD countries rates by wealth quintiles were derived from health surveys of women aged 25-64 years (cervical) and 50-69 years (breast) who reported that they had been screened within the three years prior to the survey.

Bermuda, on the other hand, used data from the "Health Survey of Adults & Children in Bermuda (2006)", where figures were calculated for cervical cancer screening of women aged 25-64 years and for breast cancer screening of women aged 50-59 years. Results show the percentage of women who reported cancer screening in the two years prior to the survey and is broken down according to household income groups in order to identify any inequalities. Bermuda figures are broken down into three income brackets (low, middle and high).

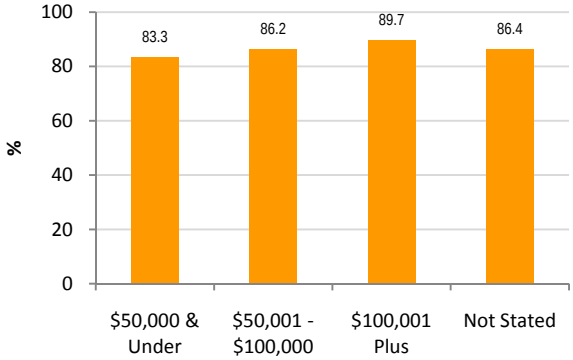
Caution is required when interpreting screening estimates based on self-reported health surveys because participants are inclined to overestimate desirable behaviours.

6.5.1 Percentage of women receiving a Pap test in past year, by income, 2006 (BDA)



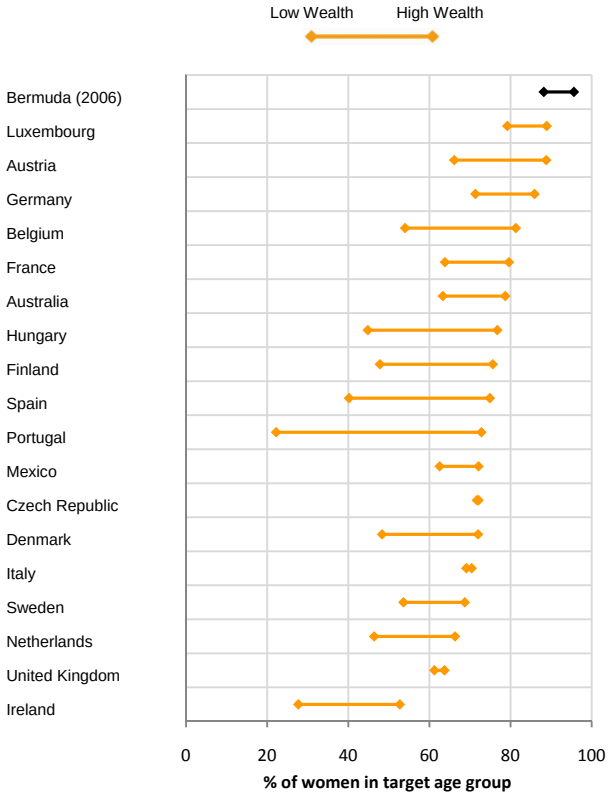
SOURCE: Health Survey of Adults & Children in Bermuda 2006. **NOTE:** Data presented refers to women aged 18 years and older.

6.5.2 Percentage of women 40 years and older receiving a mammogram in past year, by income, 2006 (BDA)



SOURCE: Health Survey of Adults & Children in Bermuda 2006.

6.5.3 Cervical cancer screening in selected OECD countries, by wealth quintile, 2002-04



SOURCE: Gakidou, Nordhagen & Obermeyer (2008).

6.5.4 Breast cancer screening in selected OECD countries, by wealth quintile, 2002-04

SOURCE: WHO (2008).

NOTE: Bermuda figures are broken down into three income brackets (low, middle and high), rather than wealth quintiles. Results in figure 6.5.1 include all women aged 18 and over. Figure 6.5.2 includes women 40 years and older. Figures 6.5.3 and 6.5.4 include different age brackets; for cervical 25 -64 years, and for breast 50 - 69 years. The data source for some countries may be different to that used for reporting breast and cervical cancer screening in Chapter 5. Since these studies were conducted, a number of countries, including Ireland, have introduced national population-based screening.

7. HEALTH EXPENDITURE AND FINANCING

7.1 Health expenditure per capita

Total health expenditure per capita is the total amount spent on healthcare by a community divided by the population. It expresses how much was spent per person on average. Total expenditure includes all expenditure by private health providers, Government services, hospitals, overseas care, charities, and administration. In Bermuda, public sector expenditure includes the Bermuda Hospitals Board and the Ministry of Health. The private sector expenditure comprises of private physicians, dentists, other providers, services and appliances, prescription drugs, overseas care and health insurance administration. The figures are expressed using a common currency unit.

Bermuda's total health expenditure per capita in 2007 was USD PPP $4,959 (Figure 7.1.2). In relation to the OECD, this places Bermuda as the country with the second-highest level of expenditure, surpassed only by the US. Bermuda compares unfavourably to the OECD average expenditure of USD PPP $2,984. Since 1999 45% to 47% of expenditure has been in the public sector, and 55% to 53% in the private sector (Figure 7.1.1). However, in 2007 expenditure was split evenly between two sectors. Healthcare expenditure has been increasing above GDP growth in Bermuda, as in all OECD countries.

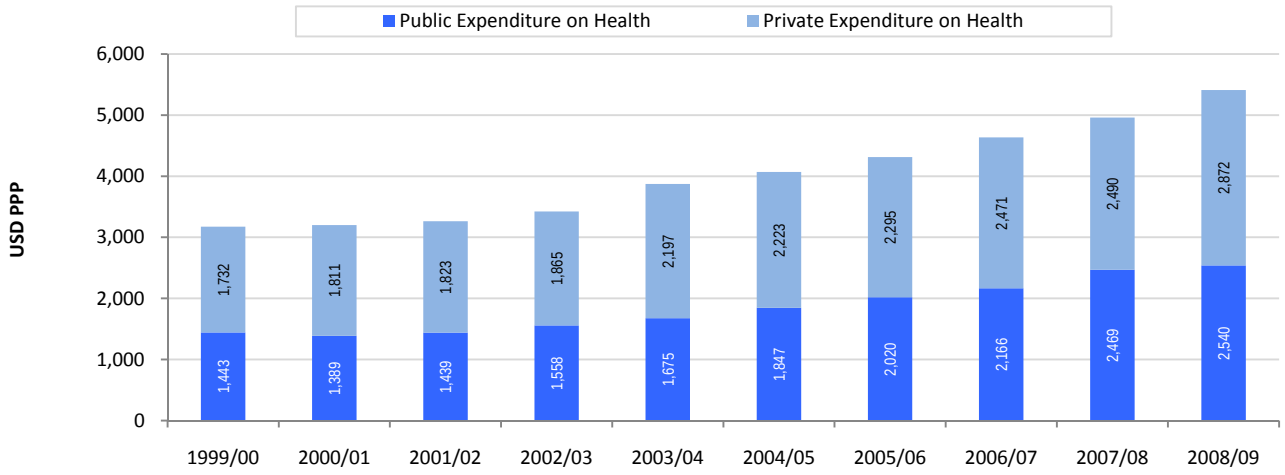
Definition and deviations

Total expenditure on health measures the final consumption of health goods and services (i.e. current health expenditure) plus capital investment in healthcare infrastructure. This includes spending by both public and private sources on medical services and goods, public health and prevention programmes and administration. Countries' health expenditures are converted to a common currency (US dollar) and adjusted to take account of the different purchasing power of the national currencies, in order to compare spending levels. It is referred to as purchasing power parity (PPP). Economy-wide (GDP) PPPs are used as the most available and reliable conversion rates (OECD, 2009, p160).

The Bermuda figures are from the National Health Accounts Report 2010, adjusted for PPP. The annual figures reported apply the fiscal year with the greatest proportion of any calendar year. For example, 2007 figures reflect fiscal year 2007/08 because it includes nine months of 2007.

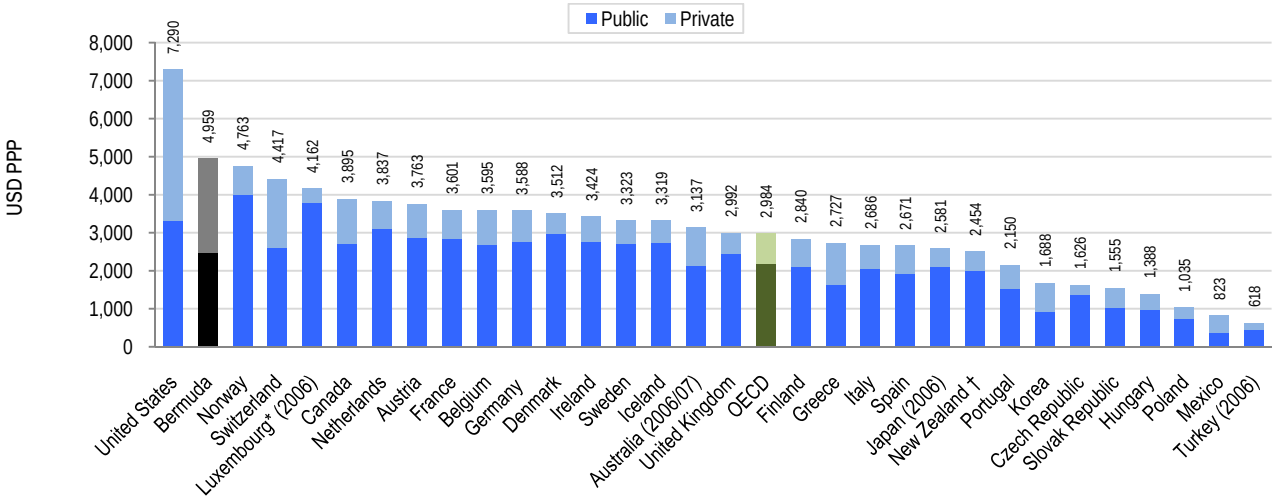
The growth rates presented in Figure 7.1.4 have been adjusted to take account of series breaks that are in most cases due to the implementation of the System of Health Accounts. To remove these breaks, the real growth in the year of the series break has been assumed to be the average growth of the preceding and following years (OECD, 2009, p160).

7.1.1 Total health expenditure per capita, public and private (BDA)



SOURCE: National Health Accounts Report 2010

7.1.2 Total health expenditure per capita, public and private, 2007



*Health expenditure is for the insured population rather than resident population. †Current health expenditure.

SOURCE: OECD Health Data 2009

7.2 Health expenditure in relation to GDP

Total health expenditure as a share of Gross Domestic Product (GDP) describes the proportion of national wealth that was spent on healthcare. It expresses the percentage of economic activity in a country that is attributed to the health system. The proportion of household expenditure dedicated to healthcare costs is also significant as an indicator of burden on households.

Bermuda's total health expenditure represented 8.5% of GDP in 2007 (Figure 7.2.2). This compares well with the OECD average of 8.9%. The level of health expenditure as a share of GDP has remained largely constant since 2003, with more of the variation accounted for by private sector expenditure. Between 2003 and 2008 public expenditure oscillated between 4.0% and 4.3% of GDP, while private expenditure has ranged between 4.2% and 5.1% of GDP (Figure 7.2.1).

Bermuda's total health expenditure as a share of total household consumption has increased steadily since 2004, reaching 17.8% in 2007 (Figure 7.2.2). This estimate indicates that on average, healthcare costs represented nearly 18% of all household spending. Bermuda has the second highest level of health expenditure as a share of household consumption, which compares unfavourably to OECD countries where the average is 12.9% (Figure 7.2.4). However, Figure 7.2.5 shows that Bermuda is aligned with OECD countries in the proportion of total health spending per capita in relation to national wealth or GDP per capita.

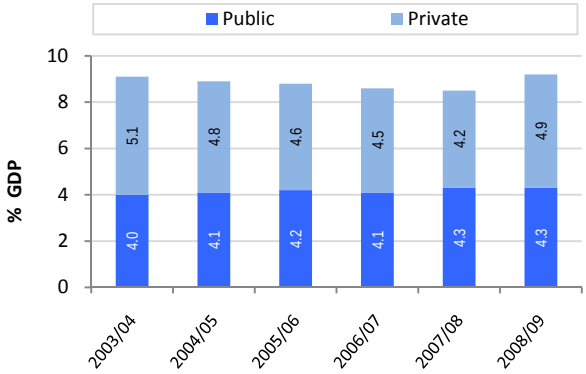
Definition and deviations

Gross Domestic Product (GDP) = final consumption + gross capital formation + net exports. Actual final consumption of households includes goods and services used by households or the community to satisfy their individual needs. It includes final consumption expenditure of households, general government and non-profit institutions serving households.

Differences in the relative positions of countries according to the ratio of total health expenditure to GDP and current health expenditure to actual final consumption expenditure are due to differences in the level of investments (in the economy as a whole, and in the health sector), in the balance of foreign trade across countries, and in net income from abroad. These adjustments are significant for countries such as Luxembourg, Ireland and Norway.

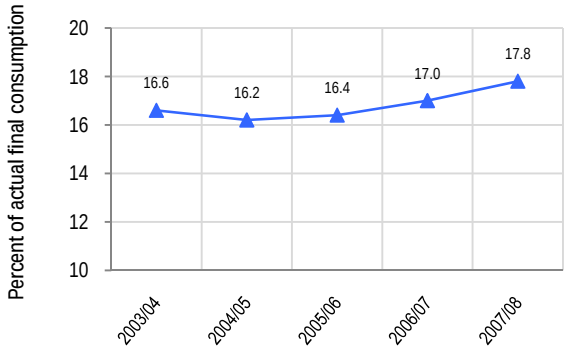
(OECD, 2009, p162)

7.2.1 Total health expenditure as a share of GDP (%) (BDA)



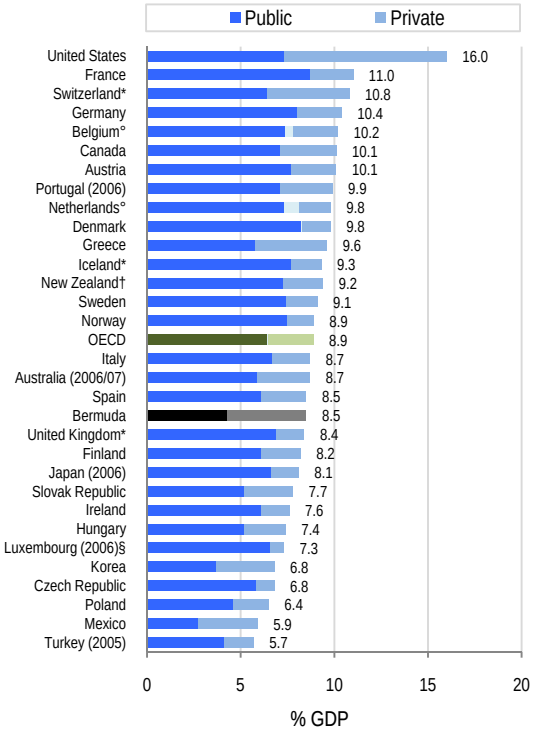
SOURCE: National Health Accounts Report 2010; Department of Statistics GDP Reports

7.2.2 Current health expenditure as a share of household consumption (BDA)



SOURCE: National Health Accounts Report 2010; Department of Statistics GDP Reports

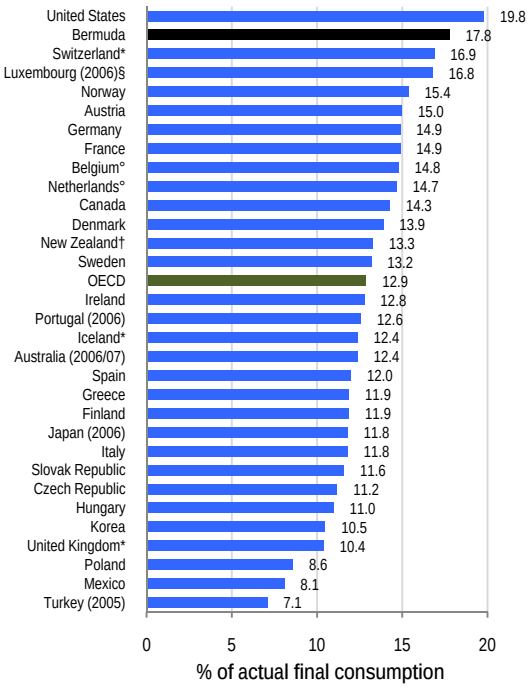
7.2.3 Total health expenditure as a share of GDP, 2007



*Total expenditure on health in both figures. †Current expenditure on health in both figures. °Public and private expenditures are current expenditures (excluding investments). §Health expenditure is for the insured population rather than resident population.

SOURCE: OECD Health Data 2009

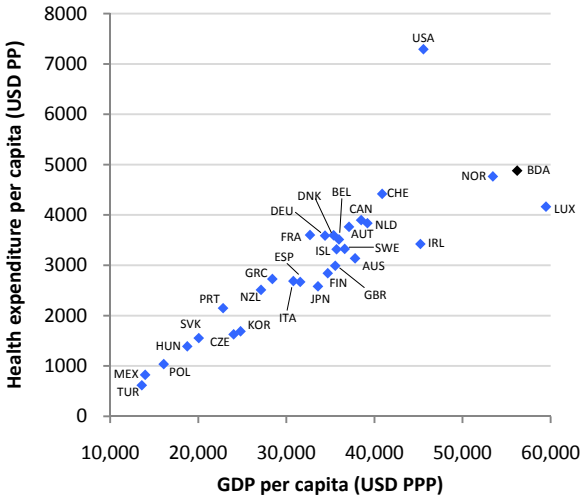
7.2.4 Current health expenditure as a share of household consumption, 2007



*Total expenditure on health in both figures. †Current expenditure on health in both figures. °Public and private expenditures are current expenditures (excluding investments). §Health expenditure is for the insured population rather than resident population.

SOURCE: OECD Health Data 2009

7.2.5 Total health expenditure per capita and GDP per capita, 2007



SOURCE: OECD Health Data 2009

7.3 Health expenditure by function

Health spending occurs in a variety of sectors that provide health services ranging from individual care in the community such as medical and dental treatment, to hospital care, and population health such as control of communicable diseases. The level of expenditure dedicated to each sector varies between countries and is dependent on structural and resource factors, but provides information on the patterns of investment and priority given to each.

Health expenditure in collective, in-patient and out-patient services increased steadily since 2003 (Figure 7.3.1). Between 2003 and 2008 in-patient expenditure increased by 36%, outpatient and ambulatory care expenditure by 37.6%, and collective services/public health expenditure increased by 32%. Expenditure on public health prevention programmes has been constant, between 5% and 5.9% of total health expenditure in the same period (Figure 7.3.2), which places Bermuda among the countries with the highest proportion of health expenditure dedicated to public health, and above the OECD average of 3% (Figure 7.3.4). Figure 7.3.4 shows Bermuda's health system expenditure by all functions, indicating the greatest area of growth has been hospital costs locally and overseas. Bermuda Hospitals Board accounted for 37% of total health expenditure in 2003 and 40% in 2008, while overseas costs represented 11% of total expenditure in 2003, and 16% in 2008.

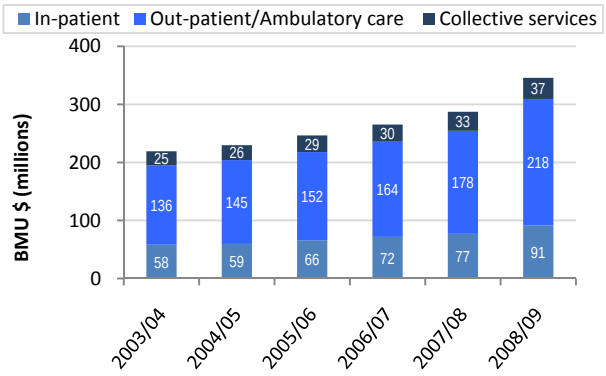
Definition and deviations

The functional approach of the System of Health Accounts defines the boundaries of the health system. Total health expenditure consists of current health spending and investment. Current health expenditure comprises personal healthcare (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (public health services and health administration). Curative, rehabilitative and long-term care can also be classified by mode of production (in-patient, day care, out-patient and home care). Outpatient and ambulatory care include diagnosis, observation, treatment and rehabilitation (OECD, 2009, p164).

Bermuda presently does not break down current health expenditure according to the categories defined by the System of Health Accounts. As a result, data is presented only for inpatient, out-patient and collective services.

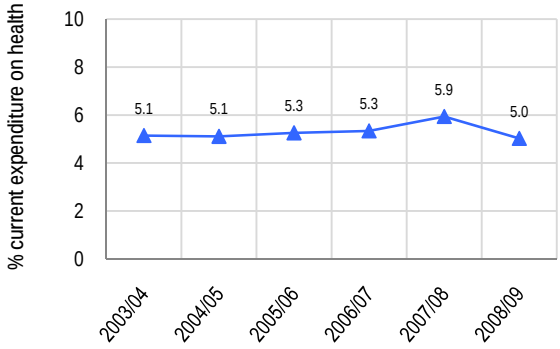
Factors limiting the comparability across countries include estimations of long-term care expenditure. Also, in some cases, expenditure in hospitals is used as a proxy for in-patient care services, although hospital expenditure may include spending on out-patient, ancillary, and in some cases drug dispensing services (Orosz and Morgan, 2004).

7.3.1 Current health expenditure by function of healthcare (BDA)



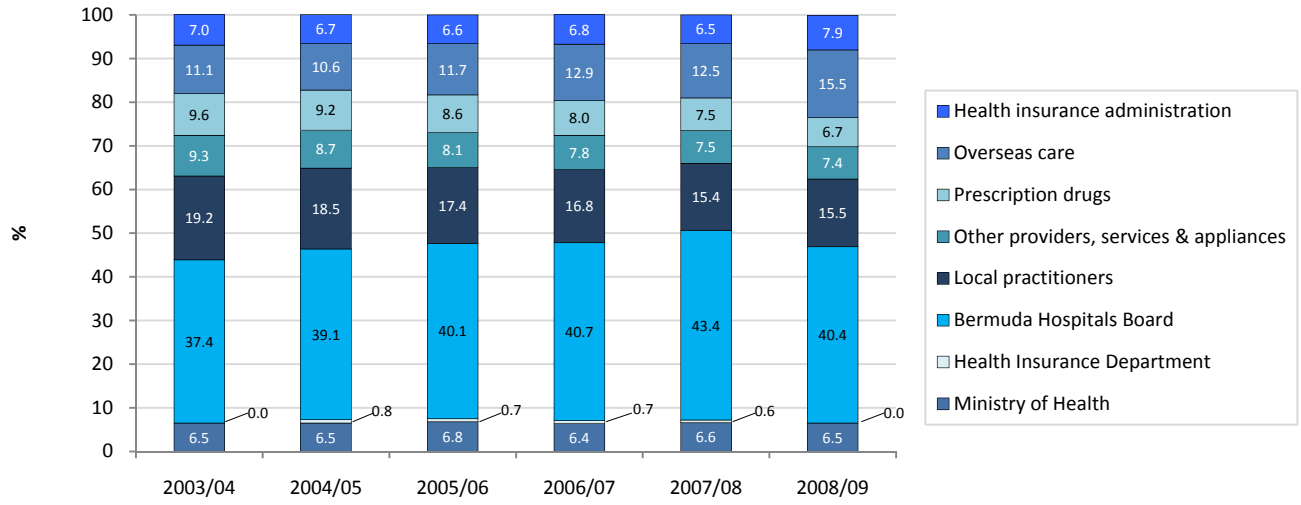
SOURCE: National Health Accounts Report 2010; BHB Annual Reports 2004 - 2009; BHeC Health Insurance Claims Return

7.3.2 Expenditure on organized public health and prevention programmes (BDA)



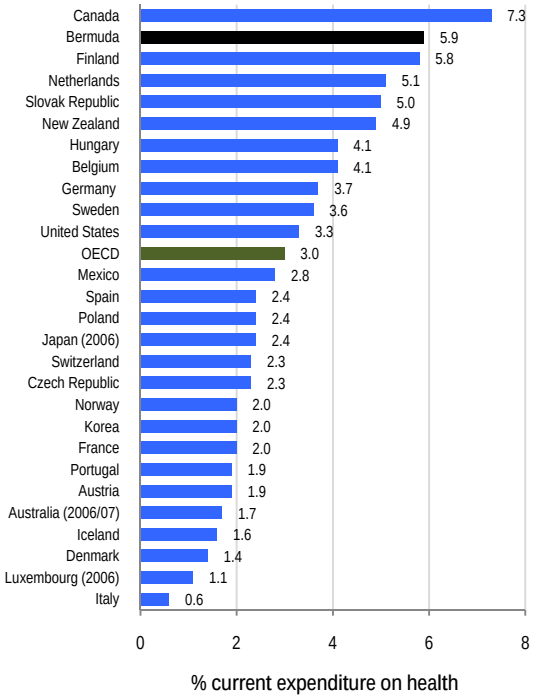
SOURCE: National Health Accounts Report 2010

7.3.3 Total health expenditure, share by function (BDA)



SOURCE: National Health Accounts Report 2010

7.3.4 Expenditure on organised public health and prevention programmes, 2007



SOURCE: OECD Health Data 2009

Photo: R. Matthews

7.4 Pharmaceutical expenditure

Pharmaceutical expenditure is an important indicator because it accounts for a significant proportion of total health spending in many countries. Most countries have experienced an increase in the use of pharmaceuticals as new drugs are developed and population demographics and health status have changed. The increase in drug utilisation has a complex relationship to overall health expenditure, as it can contribute to reduction of hospitalisation. In the OECD, pharmaceutical spending accounted for 15% of total health spending in 2007.[60] Bermuda does not have a comparable figure for overall pharmaceutical expenditure, but spending on prescription drugs alone accounted for 7.5% of total health spending in 2007.[61] However, Bermuda's figures must be treated with caution as they exclude over-the-counter products, which the comparison countries do include.

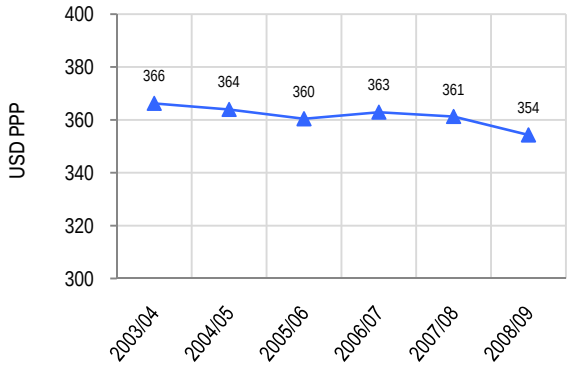
Bermuda's expenditure on pharmaceuticals decreased between 2003 and 2008 in both the total amount spent (Figure 7.4.1) and the share of GDP it represented (Figure 7.4.2). In 2007 Bermuda spent USD PPP $361 per capita on prescription drugs, while the OECD average was USD PPP $461 per capita on prescription and over-the-counter drugs (Figure 7.4.3). However, Bermuda's expenditure on prescription drugs alone was 1.4% of GDP in 2007, while the OECD average was 1.5% of GDP spent on prescription and over-the-counter pharmaceuticals (Figure 7.4.4). Future inclusion of over-the-counter pharmaceuticals in Bermuda's figures may present different trends and comparisons.

Definition and deviations

Pharmaceutical expenditure covers spending on prescription medicines and self-medication, often referred to as over-the-counter products, as well as other medical non-durable goods. It also includes pharmacists' remuneration when the latter is separate from the price of medicines. Pharmaceuticals consumed in hospitals are excluded. Final expenditure on pharmaceuticals includes wholesale and retail margins and value-added tax (OECD, 2009, p166).

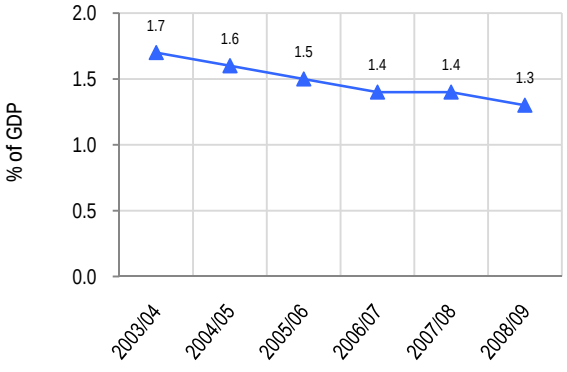
The data presented for Bermuda in this section reflects only private expenditure on prescription drugs. Bermuda presently does not collect data on general pharmaceutical expenditure or on public expenditure on pharmaceuticals.

7.4.1 Expenditure on prescription drugs per capita (BDA)



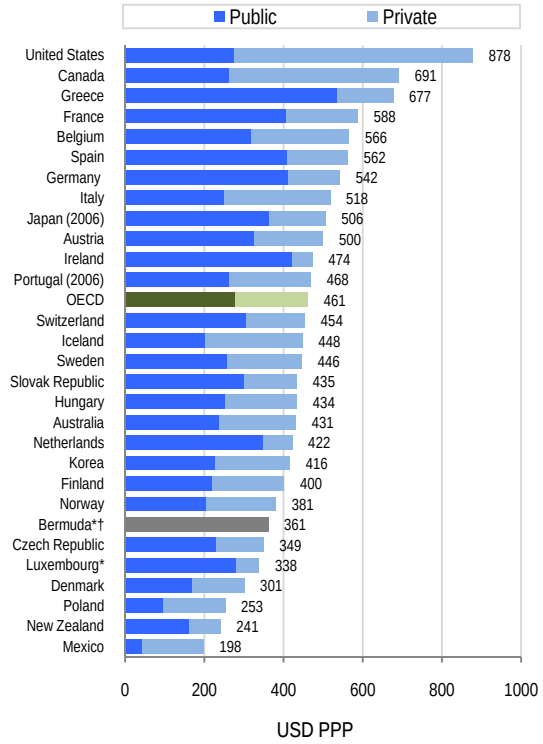
SOURCE: National Health Accounts Report 2010; Department of Statistics, Government of Bermuda

7.4.2 Expenditure on prescription drugs as a share of GDP (BDA)



SOURCE: National Health Accounts Report 2010; Department of Statistics, Government of Bermuda

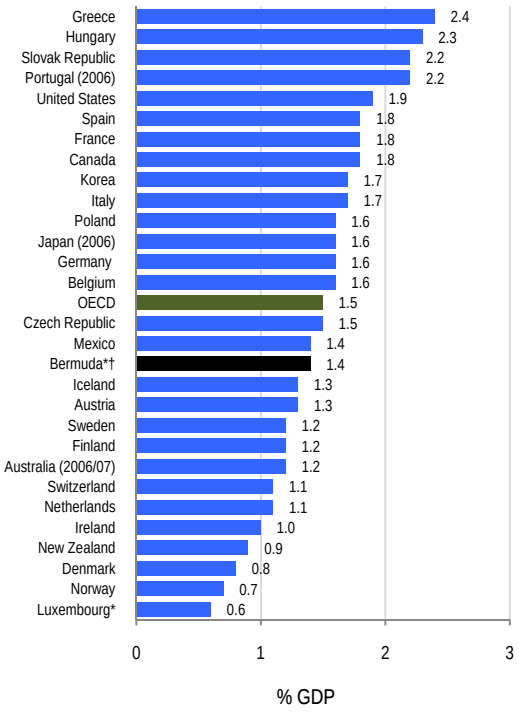
7.4.3 Expenditure on pharmaceuticals per capita, total 2007



*Prescribed medicines only. †Only includes private expenditure.

SOURCE: OECD Health Data 2009

7.4.4 Expenditure on pharmaceuticals as share of GDP, 2007



*Prescribed medicines only. †Only includes private expenditure.

SOURCE: OECD Health Data 2009

7.5 Financing of healthcare

Healthcare systems have to generate funding in order to deliver services. The financing arrangements vary between countries, but all use a mix of public and private sources. This indicator describes the financing arrangement of health systems and the extent of reliance on public and private sources, which can impact equity and access to healthcare if financial risk protection provided by these is insufficient.[62]

Figure 7.5.1 shows that the primary source of financing for healthcare in Bermuda is the private sector, accounting for 71% in 2007. The level has been relatively constant since 2003. Out-of-pocket expenditure has contributed almost 15% of financing, and private health insurance financing has ranged between 52% and 54% (Figure 7.5.2). Bermuda's public share of total financing on health was 29% in 2007. This is significantly below the OECD average of 73%, and places Bermuda as the country with the lowest proportion of public contribution, behind Mexico and the US, where 45% of financing is from the public sector (Figure 7.5.3). Out-of-pocket financing was 14% in 2007 in Bermuda, which compares favourably to the OECD average of 19.5% (Figure 7.5.4). Conversely, Bermuda has the highest reliance on private health insurance to finance healthcare, contributing 52% in 2007. The next highest are the US at 35%, Canada at 13%, and France at 13%. The OECD average is 5.6% (Figure 7.5.4).

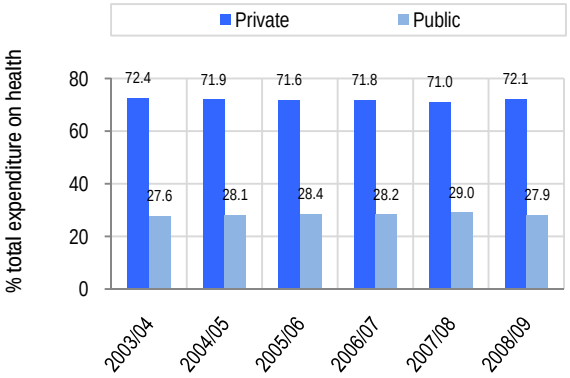
Definition and deviations

There are three elements of healthcare financing: sources of funding (households, employers and the state), financing schemes (e.g. compulsory or voluntary insurance), and financing agents (organisations managing the financing schemes). Here "financing" is used in the sense of financing schemes as defined in the System of Health Accounts. Public financing includes general government revenues and social security funds. Private financing covers households' out-of-pocket payments, private health insurance and other private funds (NGOs and private corporations).

Out-of-pocket payments are expenditures borne directly by the patient. They include cost-sharing and, in certain countries, estimations of informal payments to healthcare providers.

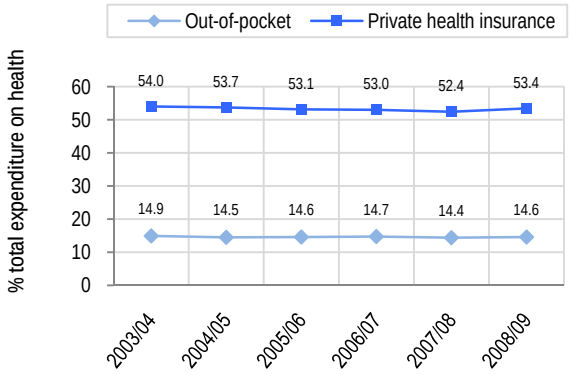
(OECD, 2009, p170)

7.5.1 Share of total financing on health (BDA)



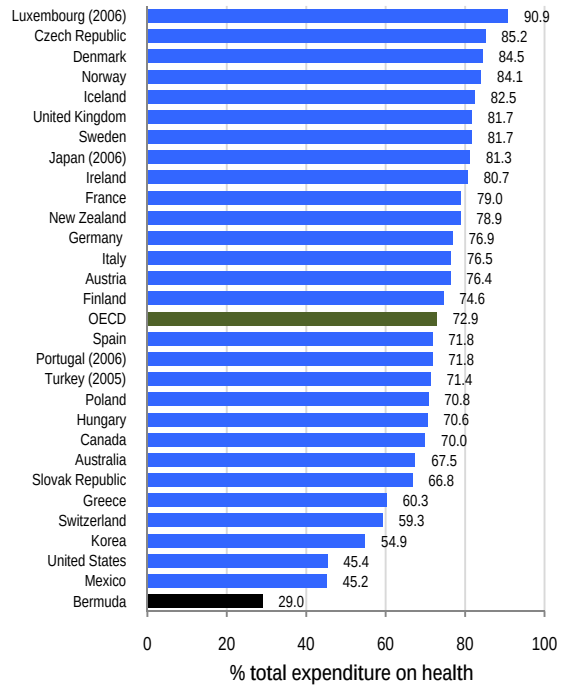
SOURCE: National Health Accounts Report 2010

7.5.2 Out-of-pocket and private health insurance financing (BDA)



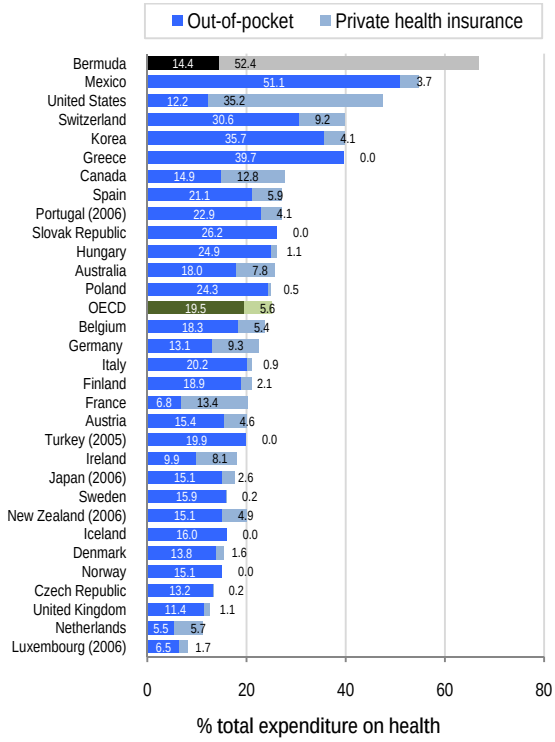
SOURCE: National Health Accounts Report 2010

7.5.3 Public share of total financing on health, 2007



SOURCE: OECD Health Data 2009

7.5.4 Out-of-pocket and private health insurance financing, 2007



SOURCE: OECD Health Data 2009

7.6 Trade in health services (overseas care)

In Bermuda trade in health services is generally referred to as "overseas care". It is also known as medical tourism in other contexts. International trade in health services is of increasing relevance to countries around the world as more people seek care across international borders. However, small jurisdictions such as Bermuda and similar Caribbean islands have a long-standing practice of relying on "overseas care" to fill gaps that a community hospital in a small jurisdiction cannot provide. This is because the volumes and economies of scale necessary to provide complex tertiary treatment cannot be achieved.

Figure 7.6.1 shows that health expenditure dedicated to overseas care has increased significantly since 2003, reaching a peak of BDA $86.5 million in 2008. In 2007 overseas care represented 12.5% of Bermuda's total health expenditure, significantly above other OECD countries (Figure 7.6.2). Importantly, Bermuda's size and isolation require reliance on overseas care so the comparison to OECD countries must be treated with caution. Luxembourg and Iceland have the smallest populations of OECD countries (476,000 and 311,000 respectively) and Luxembourg has the second highest import of health-related travel at 3% of total health expenditure (Figure 7.6.2). The annual growth rate in expenditure on overseas care was 20%, placing Bermuda among the countries with the higher rate of growth (Figure 7.6.3).

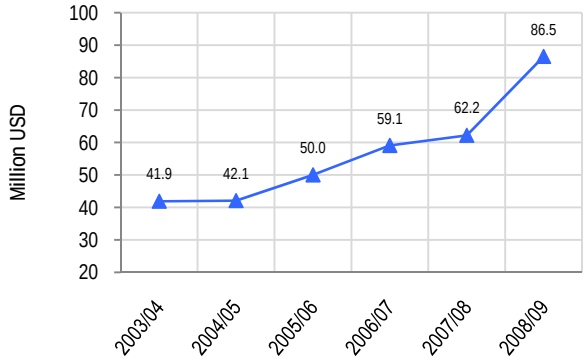
Definition and deviations

According to the Manual on Statistics of International Trade in Services, "Health-related travel" is defined as "goods and services acquired by travellers going abroad for medical reasons". In the balance of payments, trade refers to goods and services transactions between residents and non-residents of an economy.

The System of Health Accounts includes imports within current health expenditure, defined as imports of medical goods and services for final consumption. Of these the purchase of medical services and goods, by resident patients while abroad, is currently the most important in value terms. This trade is not well reported by many of the countries reporting health accounts according to the System of Health Accounts.

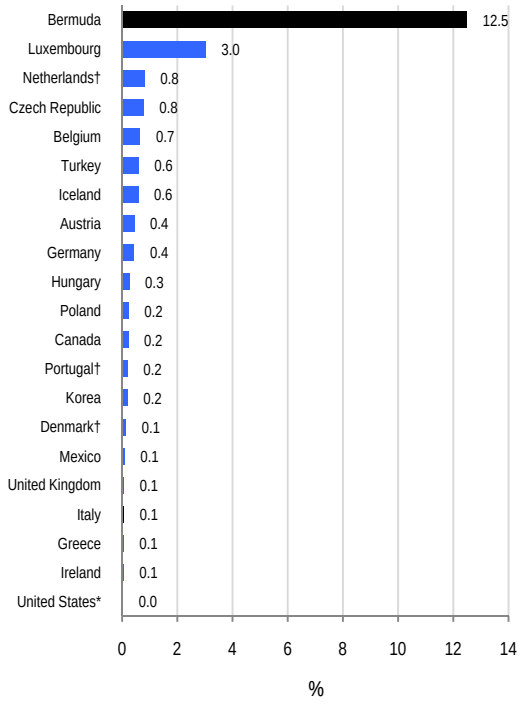
(OECD, 2009, p.172)

7.6.1 **Imports of health-related travel** (BDA)



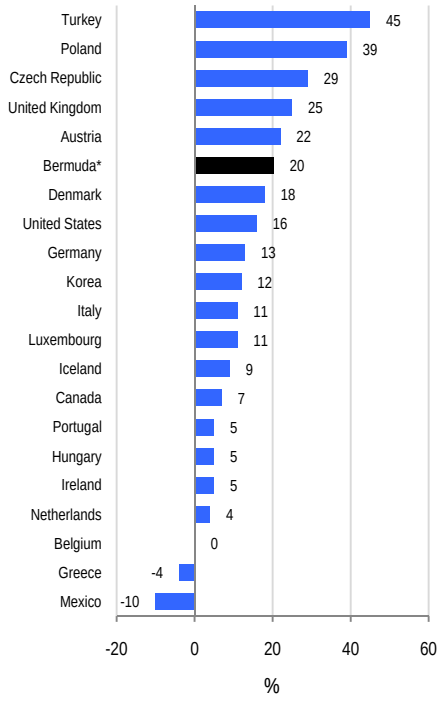
SOURCE: National Health Accounts Report 2010

7.6.2 **Imports of health-related travel as a share of total health expenditure, 2007** (or nearest year)



*Expenditure by patients in foreign countries for treatment (BEA). †System of Health Account concept of imports.
SOURCE: OECD Statistics on International Trade in Services, IMF Balance of Payments Statistics, OECD System of Health Account.

7.6.3 **Annual average growth rate in health travel imports 2004-2007** (or nearest year)



SOURCE: OECD Statistics on International Trade in Services, IMF Balance of Payments Statistics, OECD System of Health Account.

8. DEMOGRAPHICS AND SOCIOECONOMICS

8.1 Population

Population can be considered the main demographic indicator. It is important by itself and required for the calculation of many of the other indicators (denominator for rates and ratios). The age structure and gender distribution of a population is essential for public health and health system planning.

From 1997 to 2010 it is estimated that Bermuda's population increased by 6.6% (Figure 8.1.1). The population increase over this period was greater for females (9.7%) than males (6.9%) (Figure 8.1.2). This is likely related to the age- and gender-specific mortality rates; males die at a greater rate and females die at an older age.

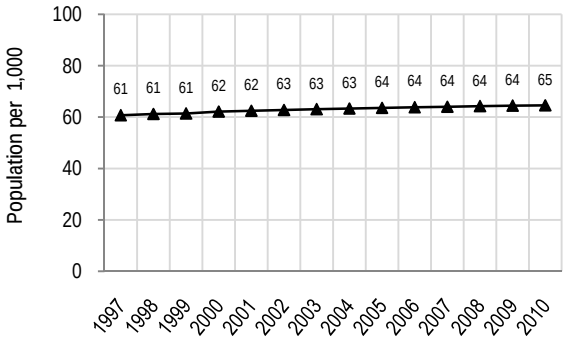
Figures 8.1.3 and 8.1.4 compare the age and gender structure of the population between 2000 and 2009. Looking solely at age, the population aged considerably as the percentage of middle-age persons (45–64 years of age) increased from 24% to 29% and the older population (65 years and over) increased from 11% to 13%. This occurred while the percentage under 15 years fell from 19% to 18% and the percentage of the population of reproductive age (15–44 years) decreased from 46% to 40%.

Definition and deviations

Population refers to all the inhabitants of a country, territory, or geographic area, and the total for a given sex and/or age group at a specific point of time. In demographic terms it is the total number of inhabitants of a given sex and/or age group that actually live within the border limits of the country, territory, or geographic area at a specific point of time, usually mid-year. The mid-year population refers to the actual population at July 1st.

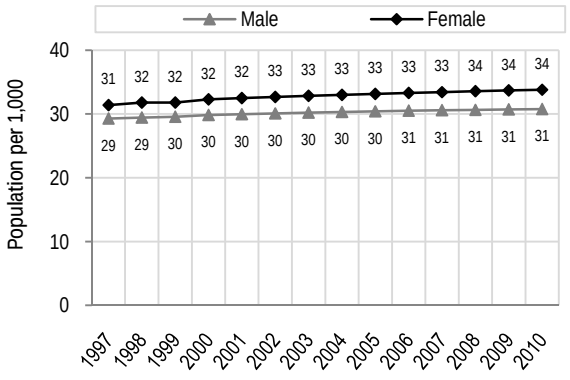
(PAHO, 2007b)

8.1.1 Total population (BDA)



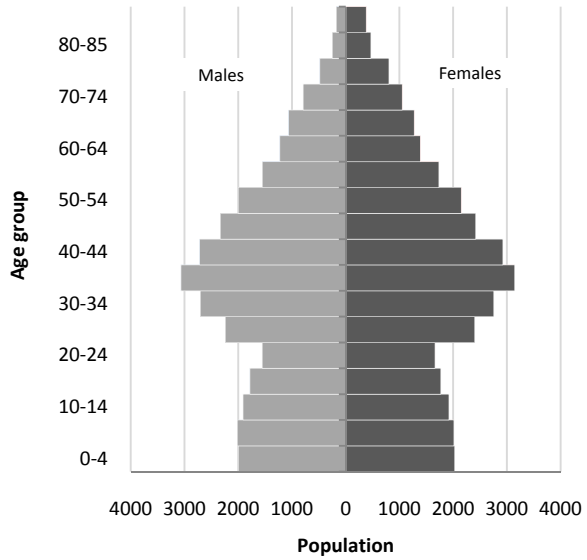
SOURCE: Dept. of Statistics (2006), Mid-Year Population Projections July 1, 2000 to July 1, 2030

8.1.2 Population by gender (BDA)



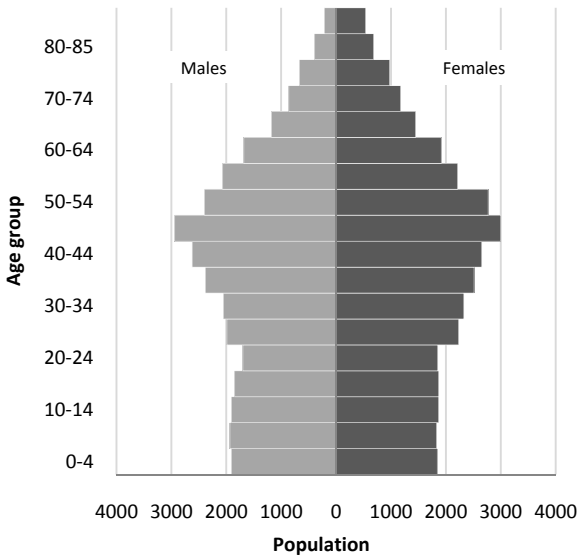
SOURCE: Dept. of Statistics (2006), Mid-Year Population Projections July 1, 2000 to July 1, 2030

8.1.3 Mid-year population by age and sex, 2000 (BDA)



SOURCE: Dept. of Statistics (2006), Mid-Year Population Projections July 1, 2000 to July 1, 2030

8.1.4 Mid-year population by age and sex, 2009 (BDA)



SOURCE: Dept. of Statistics (2006), Mid-Year Population Projections July 1, 2000 to July 1, 2030

8.2 Crude birth rate

Crude birth rate is a basic demographic indicator which is also used, in combination with death and migration rates, to calculate population growth. High birth rates are generally associated with higher levels of health impairments, low life expectancy, and low living standards. Low birth rates are associated with, among other things, economic prosperity (the demographic-economic paradox).

There has been a gradual, yet moderate, decline in the crude birth rate in Bermuda (Figure 8.2.1). This could be reflective of the reduction in the number and proportion of females of reproductive age (15-45 years). While the total population increased between 2000 and 2008/09 the number of females of reproductive age decreased by over 1,000, and the gender balance shifted from 0.96 males per female to 1.1 males per female (Figures 8.1.3 and 8.1.4).

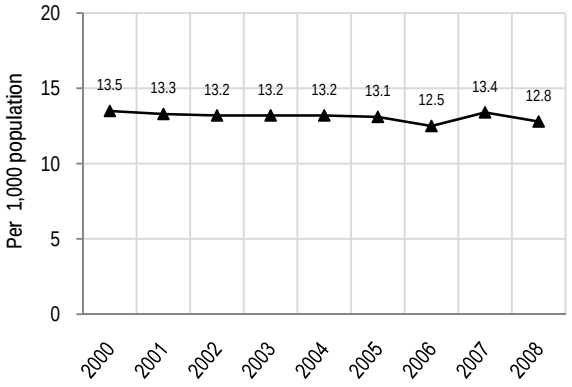
The decline in birth rates has implications for population structure, dependency ratios, and overall population growth. Bermuda's crude birth rate is generally higher than Canada and lower than the United States.[63]

Definition and deviations

Crude birth rate is the ratio between the number of live births in a population during a given year and the total mid-year population for the same year.

(PAHO, 2007b)

8.2.1 Crude birth rate (BDA)



SOURCE: Department of Statistics, Government of Bermuda

8.3 Crude death rate

The crude death rate is a basic demographic indicator which is also used in combination with birth and migration rates to calculate population growth. A decline in the crude death rate indicates that less people died in a given year compared to previous years. Drastic differences between years can indicate fatal epidemics and natural disasters causing excess deaths and an increased death rate. A declining death rate, on the other hand, is influenced by a number of factors including advances in healthcare.

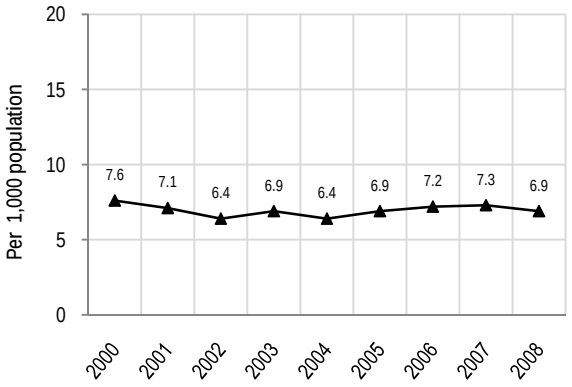
There have been moderate fluctuations in the crude death rate, but there is an overall decline (Figure 8.3.1). This can occur for a combination of reasons, including fewer people dying locally and increased longevity in the population as a whole.

Definition and deviations

Crude death rate is the ratio between the number of deaths in a population during a given year and the total mid-year population for the same year.

(PAHO, 2007b)

8.3.1 Crude death rate (BDA)



SOURCE: Department of Statistics, Government of Bermuda

8.4 Annual birth average

The annual birth average is an important indicator for the planning of healthcare, and other services. In addition, it can be a way of estimating fertility, which combined with life expectancy and estimates of mortality and migration, can assist in the calculation of population projections.

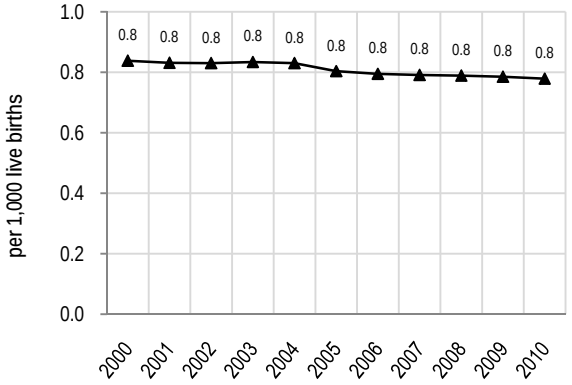
There has been a steady, yet moderate, decrease in Bermuda's annual birth average (Figure 8.4.1). This may be associated with Bermuda's ageing population.

Definition and deviations

Annual birth average refers to the total number of live births expected in a specific year.

(PAHO, 2007)

8.4.1 Annual birth average (BDA)



SOURCE: Department of Statistics, Government of Bermuda

8.5 Annual death average

The annual death average, a method of estimating mortality, is an important indicator for two reasons. Firstly, it is combined with life expectancy and estimates of fertility and migration to produce population projections. Secondly, it can be compared to mortality rates to determine if the population is experiencing a period of excess deaths.

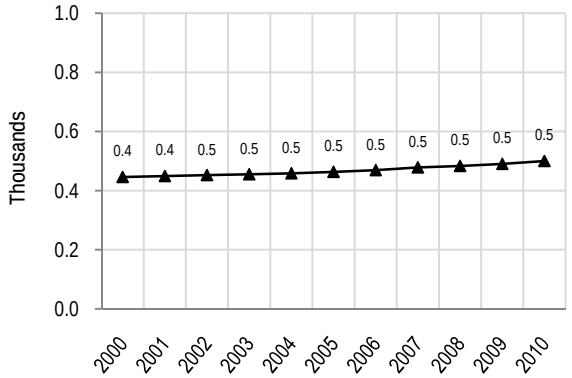
There has been a steady, yet moderate, increase in Bermuda's annual death average (Figure 8.5.1). This may be associated with Bermuda's ageing population.

Definition and deviations

Annual death average refers to the total number of deaths expected in a specific year.

(PAHO, 2007)

8.5.1 Annual deaths average (BDA)



SOURCE: Department of Statistics, Government of Bermuda

8.6 Annual population growth rate

The population growth rate reflects population birth, death, and migration rates. A positive growth rate indicates that the population is increasing, while a negative growth rate indicates that the population is decreasing. A population growth rate of 0 indicates that there is no net change in births, deaths, and migration patterns.

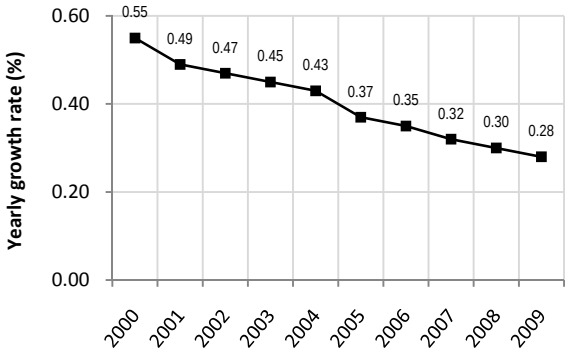
Bermuda's population growth rate is declining (Figure 8.6.1). This means that although the population continues to grow, it is growing at a slower rate each year. This is attributable to lower birth and death rates and longer longevity. However, as growth slows, the average age of the population increases as does the proportion of the elderly. This, in turn, affects dependency ratios and the capacity of a country to support and maintain itself. Immigration policies also influence population growth.

Definition and deviations

Annual population growth rate refers to the annual, average rate of change of the population size. The rate expresses the ratio between the annual increase in the population size and the total population for that year (usually multiplied by 100). The annual increase in the population size is defined as a sum of differences: the difference between births less deaths and the difference between immigrants less emigrants.

(PAHO, 2007b)

8.6.1 Annual population growth rate (BDA)



SOURCE: Department of Statistics, Government of Bermuda

8.7 Total fertility rate

The total fertility rate is a basic demographic indicator. It is the completed fertility of a hypothetical generation and is also used to indicate the replacement level fertility, i.e. the fertility needed to compensate for mortality loss. In developed countries, a rate of 2.1 is considered to be the replacement level.[64]

The total fertility rate has been relatively constant over the years, although it remains below replacement level (Figure 8.7.1). This has implications for population growth and migration.

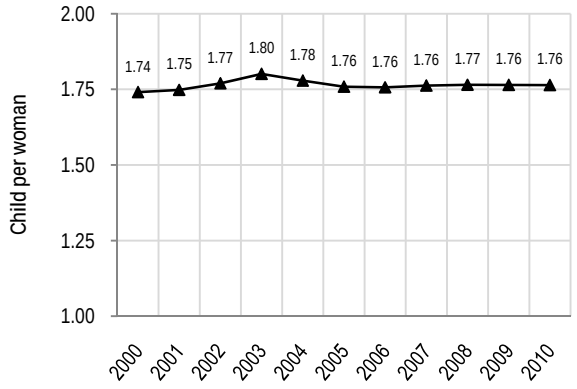
Bermuda's total fertility rate is higher than Canada's rate, but it is lower than the United States rate.[65]

Definition and deviations

The total fertility rate is the expected average number of children that would be born to a woman in her lifetime, if she were to pass through her childbearing years experiencing the current age-specific fertility rates.

(PAHO, 2007b)

8.7.1 Total fertility rate (BDA)



SOURCE: Department of Statistics, Government of Bermuda

8.8 Dependency ratio

Dependency ratios are an indicator of the potential burden on the working population to provide resources and services to the non-working population. Resources include healthcare services and taxation to fund health and social services for the young and the elderly.

Bermuda's dependency ratio is steadily growing (Figure 8.8.1). This is related to increases in longevity and decreases in birth rates, resulting in an ageing population. As the dependency ratio escalates so does the burden on the productive part of the population to maintain the living standards for the economically dependent.

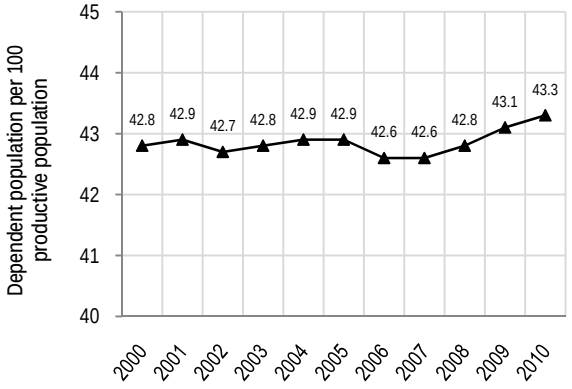
Bermuda's dependency ratio is on par with Canada, but lower than the United States, which also has an ageing population.[66] Most OECD and Caribbean countries have higher dependency ratios.

Definition and deviations

Dependency ratio is the average number of economically dependent population per 100 economically productive population. In demographic terms, economically dependent population is defined as the sum of the population under 15 years of age plus the population 65 years of age and over.

(PAHO, 2007b)

8.8.1 Dependency ratio (BDA)



SOURCE: Department of Statistics, Government of Bermuda

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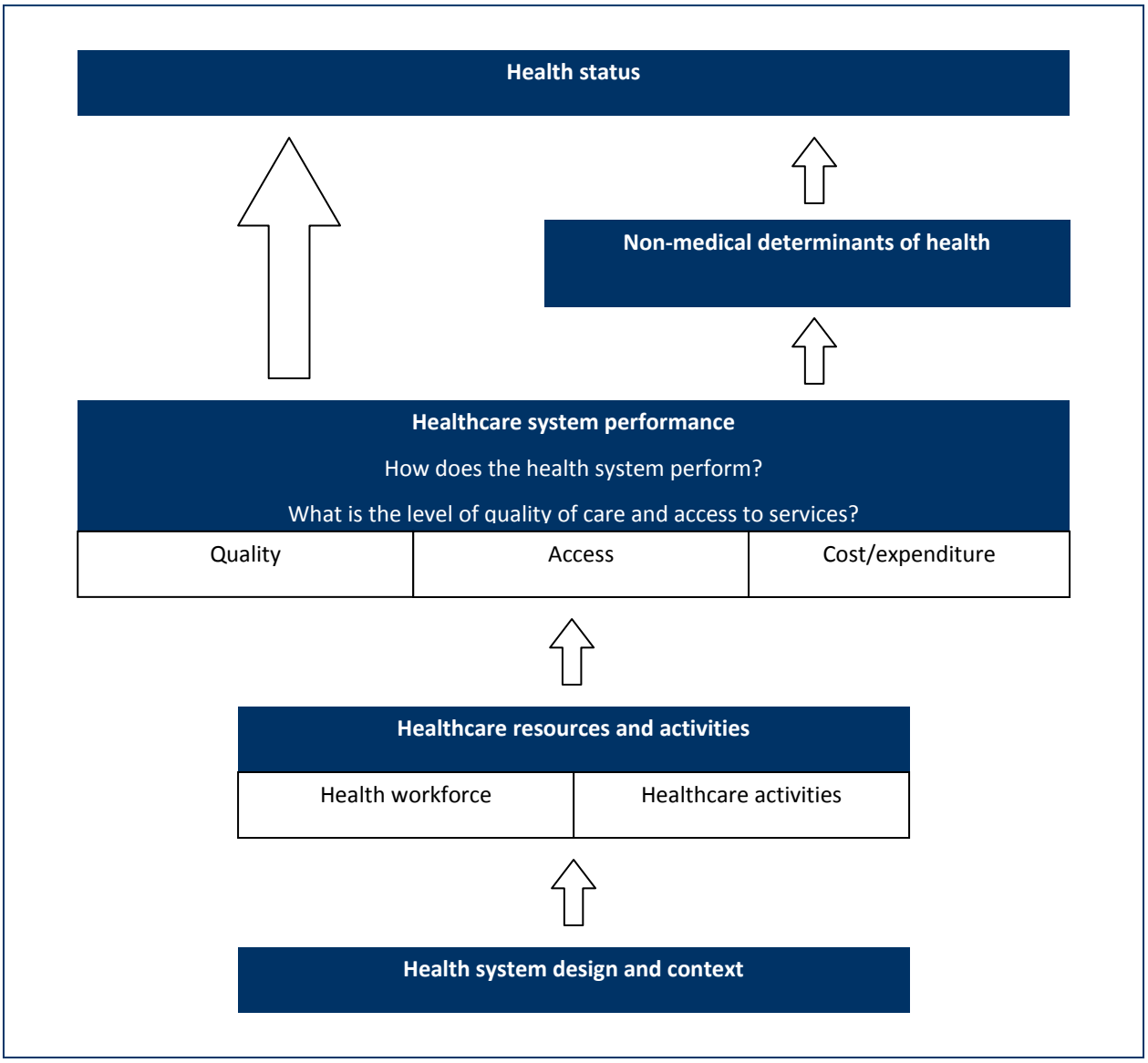
Annex A

OECD Countries (as at November 2009) & ISO Codes

Australia	AUS	Korea	KOR
Austria	AUT	Luxembourg	LUX
Belgium	BEL	Mexico	MEX
Canada	CAN	Netherlands	NLD
Czech Republic	CZE	New Zealand	NZL
Denmark	DNK	Norway	NOR
Finland	FIN	Poland	POL
France	FRA	Portugal	PRT
Germany	DEU	Slovak Republic	SVK
Greece	GRC	Spain	ESP
Hungary	HUN	Sweden	SWE
Iceland	ISL	Switzerland	CHE
Ireland	IRL	Turkey	YUR
Italy	ITA	United Kingdom	GRB
Japan	JPN	United States	USA

Annex B

Conceptual framework for health system performance assessment



Source: Adaptation of the OECD (2009) Health at a Glance 2009: OECD Indicators. OECD Publishing: Paris; and from OECD (2006) "Conceptual Framework for the OECD Health Care Quality Indicators Project", OECD Health Working Paper, No. 23, OECD Publishing, Paris.

Annex C

PAHO Caribbean comparisons

	2007										2009									
	total population (thousands) 2007	Life expectancy at birth (years) 2007			Maternal mortality ratio (100,000 lb) or number of deaths (Nº)			Infant mortality rate (1,000 lb) or number of deaths (Nº)			Total population (thousands) 2009	Life expectancy at birth (years) 2009			maternal mortality ratio (100,000 lb) or number of deaths			Infant mortality rate (1,000 lb) or number of deaths		
		total	male	female	ratio	(Nº)	year	rate	(Nº)	year		total	male	female	ratio	(Nº)	year	rate	(Nº)	year
Bermuda	64	79.0	76.3	81.7	125.3	1	2006	3.8	3	2006	65	79.3	76.6	82.1	-	-	2007	4.7	4	2007
Latin Caribbean	35,663	72.0	69.5	74.6	…			34.5			36,404	72.4	70.0	74.8	319.1			34.2		
Cuba	11,268	78.3	76.2	80.4	49.4		2006	5.3		2006	11,204	78.8	76.9	81.0	46.5		2008	4.7		2008
Dominican Republic	9,760	72.2	69.3	75.5	80.0		2006	30.6		2006	10,090	72.7	70.0	75.6	86.3		2008	29.6		2008
French Guiana	202	75.9	72.6	79.9	n/a	2	2001	10.4		2003	226	76.2	72.8	80.1	…			12.1		2007
Guadeloupe	445	79.2	76.0	82.2	n/a	3	2004	7.1		2005	465	79.3	76.2	82.4	n/a	1	2005	6.1		2007
Haiti	9,598	60.9	59.1	62.8	630.0		2005-06	57.0		2005-06	10,033	61.5	59.7	63.2	630.0		2006	57.0		2006
Martinique	399	79.5	76.5	82.3	-		2004	6.1		2003	405	79.8	76.8	82.5	12.8		2005	8.8		2007
Puerto Rico	3,991	78.7	74.7	82.7	n/a	3	2005	9.3		2005	3,982	79.0	75.0	82.9	n/a	5	2007	8.4		2007
Non-Latin Caribbean	6,960	71.8	69.2	74.5	…			19.9			7,051	71.8	68.6	75.0	…			…		
Anguilla	14	77.5	74.5	80.5	-		2006	n/a	1	2006	14	81.0	78.1	83.3	-		2008	…		
Antigua & Barbuda	69	72.4	70.0	74.9	-		2006	n/a	9	2006	86	75.0	72.8	76.8	-		2008	17.5		2008
Aruba	104	74.2	71.3	77.1	n/a	1	2004	n/a	3	2004	107	74.9	72.3	77.5	n/a	1	2004	n/a	3	2004
Bahamas	331	73.5	70.6	76.3	n/a	5	2005	18.1		2006	342	74.0	71.2	76.7	n/a	4	2007	17.6		2007
Barbados	294	77.3	74.4	79.8	-		2005	14.2		2005	256	77.5	74.6	80.0	-		2007	14.2		2005
Cayman Islands	47	80.2	77.6	82.9	-		2006	n/a	6	2006	49	80.0	77.8	83.1	-		2008	n/a	1	2008
Dominica	69	75.1	72.2	78.2	-		2005	n/a	20	2005	73	76.0	72.6	78.6	n/a	1	2008	n/a	9	2008
Grenada	106	68.7	67.0	70.4	-		2002	19.6		2002	104	75.6	74.0	77.1	-		2007	n/a	13	2008
Guyana	738	66.8	64.2	69.9	161.2		2005	22.0		2005	762	67.4	64.8	70.5	112.5		2007	22.0		2005
Jamaica	2,714	72.6	70.0	75.2	95.0		2001-03	19.9		1998	2,719	72.1	68.8	75.5	…			21.1		2006
Montserrat	10	79.0	76.8	81.3	-		2006	-		2006	5	73.0	74.7	70.7	-		2008	-		2008
Netherlands Antilles	192	75.1	71.3	78.8	…			…			198	76.4	72.9	79.6	…			…		
St. Kitts & Nevis	39	72.7	69.8	75.7	-		2005	n/a	9	2005	40	73.0	70.3	76.3	n/a	1	2008	n/a	10	2008
Saint Lucia	165	73.7	71.9	75.6	n/a	1	2005	15.0		2005	172	74.0	72.1	75.9	n/a	2	2007	15.0		2005
St. Vincent & the Grenadines	120	71.6	69.5	73.8	-		2006	15.7		2005	109	71.8	69.8	74.1	n/a	2	2007	26.2		2006
Suriname	458	70.2	67.0	73.6	n/a	8	2004	19.2		2004	520	69.2	65.7	72.9	184.3		2007	19.8		2007
Trinidad & Tobago	1,333	69.8	67.8	71.8	n/a	5	2003	24.0		2003	1,339	69.7	66.1	73.2	n/a	9	2004	16.5		2004
Turks & Caicos Islands	22	75.0	72.7	77.3	n/a	1	2006	n/a	6*	2006	23	75.0	73.1	77.8	-		2008	n/a	1	2008
Virgin Islands (UK)	24	76.9	75.7	78.1	-		2005	n/a	2	2005	24	77.0	76.0	78.6	-		2008	n/a	7	2008

SOURCE: Health Situation in the Americas: Basic Indicators 2007 and 2009

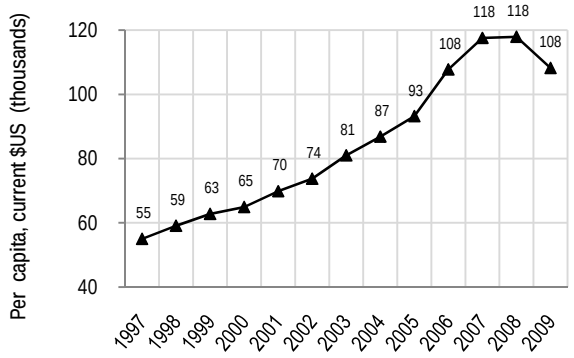
(-) magnitude zero; (n/a) not applicable; (*) preliminary data; (…) data not available

Annex D

Gross National Income

The Gross National Income (GNI) formerly referred to as gross national product (GNP), measures the total domestic and foreign value added and claimed by residents, at a given period in time (usually a year) expressed in current US dollars using the World Bank Atlas method. GNI is comprised of GDP plus net receipts of primary income (compensation of employees and property income) from non-resident sources (PAHO, 2007). It is an economic indicator which is useful in examining trends within a country and comparing relative wealth across countries. Declines in GNI can occur if a country becomes increasingly in debt and spends large amounts of income servicing this debt, perhaps by selling off resources externally.

Gross National Income (GNI) (BDA)

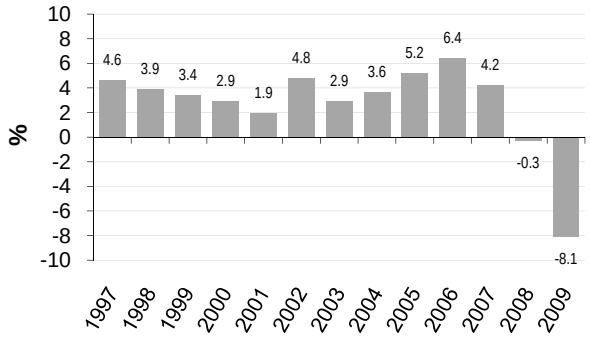


SOURCE: Department of Statistics, Government of Bermuda

Annual real GDP growth rate

The annual real GDP growth rate is the annual, average rate of change of the GDP at market prices based on constant local currency, for a given national economy during a specified period of time. It expresses the difference between GDP values from one period to the next as a proportion of the GDP from the earlier period, usually multiplied by 100.

Annual GDP growth rate (%) (BDA)



SOURCE: Department of Statistics, Government of Bermuda

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