Health at a Glance Asia/Pacific 2010



OECD

Health at a Glance: Asia/Pacific 2010



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A corrigendum has been issued for this page. See: http://www.oecd.org/dataoecd/3/5/46897775.pdf

Foreword

This first edition of *Health at a Glance: Asia/Pacific* presents a set of key indicators on health and health systems for 27 Asia/Pacific countries and economies, including four OECD member countries (Australia, Japan, New Zealand and the Republic of Korea). It builds on the format used in previous editions of *Health at a Glance: OECD Indicators* to present comparable data on health status and its determinants, health care resources and utilisation, and health expenditure and financing.

Extending the Health at a Glance format to countries in the Asia/Pacific region presents challenges. Countries in the region are diverse, and their health issues and levels of health system development often differ. The indicators selected here present a concise and quantitative overview of health and health systems in the Asia/Pacific region, using available information. Alongside the resources of the OECD, the production of *Health at a Glance: Asia/Pacific* benefitted greatly from the statistics of the World Health Organization.

This publication was prepared jointly by the OECD Health Division and the OECD/Korea Policy Centre, under the co-ordination of Luca Lorenzoni and Michael de Looper. Chapter 1 and Chapter 2 were prepared by Michael de Looper. Chapter 3 was prepared by Eunjeong Kang (Korean Institute for Health and Social Affairs), Ravi P. Rannan-Eliya and Ruwanthi Wickramasinghe (Institute for Health Policy, Sri Lanka), and Michael de Looper, Gaetan Lafortune and Valerie Moran. Chapter 4 was written by Luca Lorenzoni and Hyoung-Sun Jeong (Yonsei University, Republic of Korea). This publication benefited from the comments and suggestions of Mark Pearson (Head of OECD Health Division), Martina Pellny and Christopher James (WHO WPRO), and Sunil Senanayake (WHO SEARO).

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Introduction

Health at a Glance: Asia/Pacific 2010 presents a set of key indicators on health and health systems for 27 Asia/Pacific countries and economies, including four OECD member countries (Australia, Japan, New Zealand and the Republic of Korea). It builds on the format used in previous editions of Health at a Glance to present comparable data on health status and its determinants, health care resources and utilisation, and health expenditure and financing.

The indicators have been selected on a basis of being relevant to the health needs of people in the Asia/Pacific region, taking into account the availability and comparability of existing data. The publication takes advantage of the routine administrative and programme data collected by the World Health Organization, especially the Western Pacific and South-East Asia Regional Offices (WPRO and SEARO), as well as special country surveys collecting demographic and health information.

It also draws on the resources of collaborative partnerships of experts and agencies in the Asia/Pacific region, such as the Asia/Pacific National Health Accounts Network (APNHAN).

The indicators are presented in the form of easy-to-read figures and explanatory text.

Structure of the publication

Health at a Glance: Asia/Pacific 2010 is divided into four chapters:

- Chapter 1 on *Health Status* highlights the variations across countries in life expectancy, infant and childhood mortality and major causes of mortality and morbidity, including both communicable and non-communicable diseases.
- Chapter 2 on *Determinants of Health* focuses on non-medical determinants of health. It features the health of mothers and babies, through reproductive health issues, low birthweight and breastfeeding. It also includes lifestyle and behavioural indicators such as smoking and alcohol drinking, nutrition, and underweight and overweight, as well as water and sanitation.
- Chapter 3 on *Health Care Resources and Utilisation* reviews some of the inputs and outputs of health care systems. This includes the supply of doctors and nurses and hospital beds, as well as the provision of primary and secondary health care services, such as doctor consultations and hospital discharges, as well as a range of services surrounding pregnancy, childbirth and infancy.
- Chapter 4 on *Health Expenditure and Financing* examines trends in health spending across Asia/Pacific countries. It also looks at how health services and goods are paid for, and the different mix between public funding, private health insurance,

and direct out-of-pocket payments by households.

Annex B provides some additional tables on the demographic and economic context within which different health systems operate.

Asia/Pacific countries

For this first edition of *Health at a Glance: Asia/Pacific*, 27 regional countries and economies are compared – 22 in Asia (Bangladesh, Brunei Darussalem, Cambodia, China, Democratic People's Republic of Korea, Hong Kong-China, India, Indonesia, Japan, Lao People's Democratic Republic, Macao-China, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand and Vietnam) and five in the Pacific region (Australia, Fiji, New Zealand, Papua New Guinea and Solomon Islands).

Four of these countries are OECD members (Australia, Japan, New Zealand and the Republic of Korea).

Presentation of indicators

Each of the topics covered in this publication is presented over two pages. The first page defines the indicator and notes any significant variations which might affect data comparability. It also provides brief commentary highlighting the key findings conveyed by the data. On the facing page is a set of figures. These typically show current levels of the indicator and, where possible, trends over time. In some cases, an additional figure relating the indicator to another variable is included.

Averages

In text and figures, 'Asia-xx' refers to the unweighted average for Asian countries and economies, where 'xx' is the number of countries for which data are available. It excludes the five Pacific countries (Australia, Fiji, New Zealand, Papua New Guinea and Solomon Islands) and the OECD average.

'OECD' refers to the unweighted average for the 34 OECD member countries. It includes Australia, Japan, New Zealand and the Republic of Korea, but excludes the Asia average. Data for OECD countries are generally extracted from OECD sources, unless stated otherwise.

Country codes (ISO codes)

Australia	AUS	Mongolia	MNG
Bangladesh	BGD	Myanmar	MMR
Brunei Darussalem	BRN	Nepal	NPL
Cambodia	KHM	New Zealand	NZL
China	CHN	Pakistan	PAK
Democratic People's Republic of Korea	PRK	Papua New Guinea	PNG
Fiji	FJI	Philippines	PHL
Hong Kong-China	HKG	Republic of Korea	KOR
India	IND	Singapore	SGP
Indonesia	IDN	Solomon Islands	SLB
Japan	JPN	Sri Lanka	LKA
Lao People's Democratic Republic	LAO	Thailand	THA
Macao-China	MAC	Vietnam	VNM

Malaysia	MYS

List of acronyms

ADB	Asian Development Bank
AIDS	Acquired immunodeficiency syndrome
ALOS	Average length of stay
APNHAN	Asia/Pacific National Health Accounts Network
ART	Antiretroviral treatment
ASEAN	Association of Southeast Asian Nations
BCG	Bacille Calmette-Guerin
BMI	Body mass index
CHE	Current health expenditure
DHS	Demographic and Health Surveys
DOTS	Directly observed treatment – short course
DTP	Diphtheria-tetanus-pertussis
FAO	Food and Agriculture Organization of the United Nations
GAVI	Global Alliance for Vaccines and Immunisation
GBD	Global burden of disease
GDP	Gross domestic product
GNI	Gross national income
GP	General practitioner
HIV	Human immunodeficiency virus
IARC	International Agency for Research on Cancer
IDF	International Diabetes Federation
IHD	Ischemic heart disease
MDG	Millenium Development Goals
MICS	Multiple Indicator Cluster Surveys
MMR	Maternal mortality ratio
NHA	National health accounts
OECD	Organisation for Economic Co-operation and Development
PPP	Purchasing power parities
SEARO	WHO South-East Asia Regional Office
SHA	System of Health Accounts
TB	Tuberculosis
THE	Total health expenditure
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDESA	United Nations, Department of Economic and Social Affairs, Population Division
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WPRO	WHO Western Pacific Regional Office

Chapter 1

Health Status

1.1 Life expectancy at birth
1.2 Infant mortality
1.3 Under-5 mortality
1.4 Mortality from all causes
1.5 Mortality from cardiovascular disease
1.6 Mortality from cancer
1.7 Mortality from injuries
1.8 Maternal mortality
1.9 HIV/AIDS
1.10 Tuberculosis

Life expectancy at birth continues to increase remarkably in Asia/Pacific countries, reflecting sharp reductions in mortality rates at all ages. These gains in longevity can be attributed to a number of factors, including rising living standards, and better nutrition, water and sanitation. Improved lifestyles, increased education and greater access to quality health services also play an important role (OECD, 2004).

Life expectancy at birth for the whole population across 22 Asian countries reached 71.6 years on average in 2008, a gain of more than 14 years since 1970. For comparison, OECD countries gained nine years during the same period (Figure 1.1.1).

However, a large regional divide persists in life expectancy at birth. The country with the longest life expectancy in 2008 was Japan, with a combined value for men and women of 82.7 years. Hong Kong-China, Australia, Macao-China, Singapore and New Zealand all exceeded 80 years for total life expectancy. In contrast, a number of countries in the Asia/Pacific region have combined life expectancies of less than 70 years, and in Cambodia, Papua New Guinea and Myanmar, a child born in 2008 can expect to live an average of less than 62 years of life. Generally, Eastern Asian countries (China, Japan, the Republic of Korea) had higher life expectancies at birth than Southeast Asian countries (Cambodia, Indonesia, Malaysia, the Philippines, Thailand, Vietnam) and Southern Asia countries (India, Pakistan, Bangladesh).

Despite health improvements, there are still disparities in life expectancy between men and women and within countries. Women live longer than men, and have greater rates of survival to age 65, regardless of the economic status of the country (Figures 1.1.2 and 1.1.4). The gender gap in life expectancy stood at 4.4 years on average across Asian countries in 2008, less than the OECD country average of 5.6 years.

Higher national income (as measured by GNI per capita) is generally associated with higher life expectancy at birth (Figure 1.1.3), although there are some notable differences in life expectancy between countries with similar income per capita. Vietnam and Japan have higher, and Brunei and Thailand lower life expectancies than would be predicted by their GNI per capita alone. The socioeconomic status and educational level of women play an important role in life expectancy, with improvements in the educational background and living conditions of mothers contributing to infant and child survival.

Developing countries continue to struggle to overcome mortality causes that are linked to poorer socio-economic conditions, while post-industrial countries face emerging health threats stemming from rapid environmental and lifestyle changes (UNESCAP, 2005).

For further reading

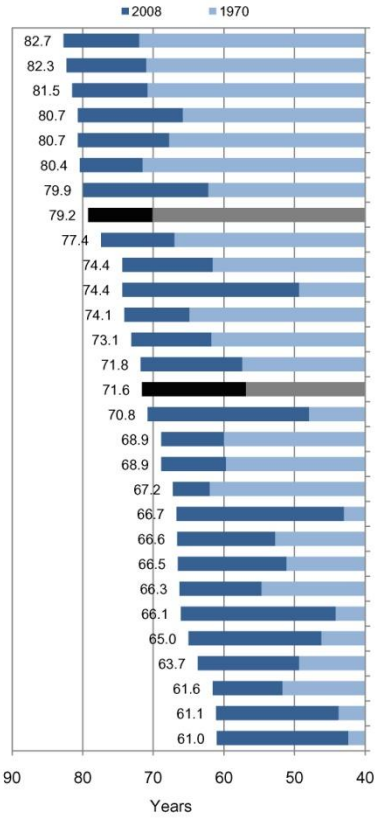
WHO (2008), *Health in Asia and the Pacific*, World Health Organization, Regional Office for Southeast Asia, New Delhi.

Definition and measurement

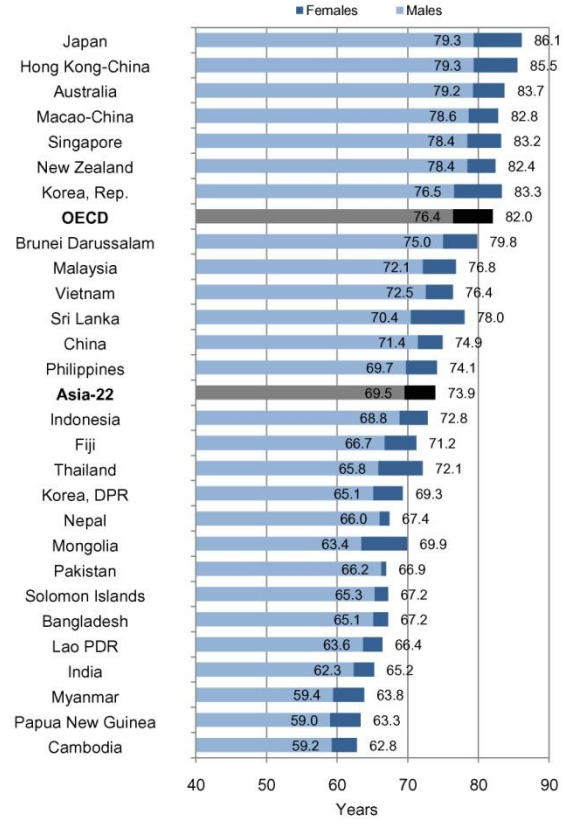
Life expectancy at birth is the best known measure of a population's health status, and is often used to gauge countries' health development. It measures how long, on average, a newborn infant would live if the prevailing patterns of mortality at the time of birth were to stay the same throughout their lifetime. As the factors which affect life expectancy do not change overnight, variations are best assessed over long periods of time.

Age-specific mortality rates are required to construct life tables from which life expectancies are derived. Countries calculates life expectancy according to methodologies that can vary somewhat, and these can lead to differences of fractions of a year. Some countries base their life expectancies on estimates derived from censuses and surveys, and not on accurate registration of deaths.

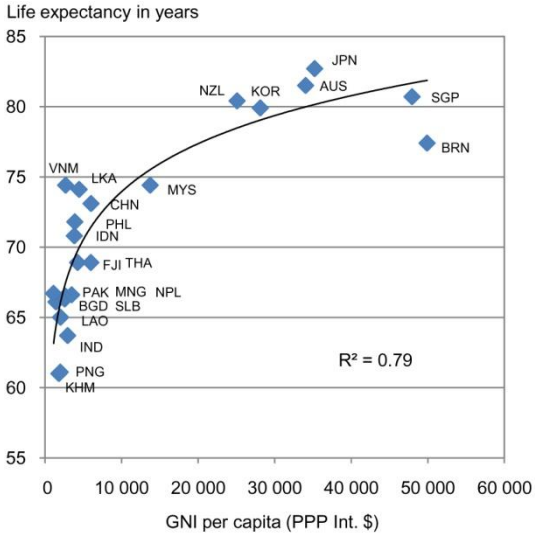
1.1.1. Life expectancy at birth, total population, 1970 and 2008



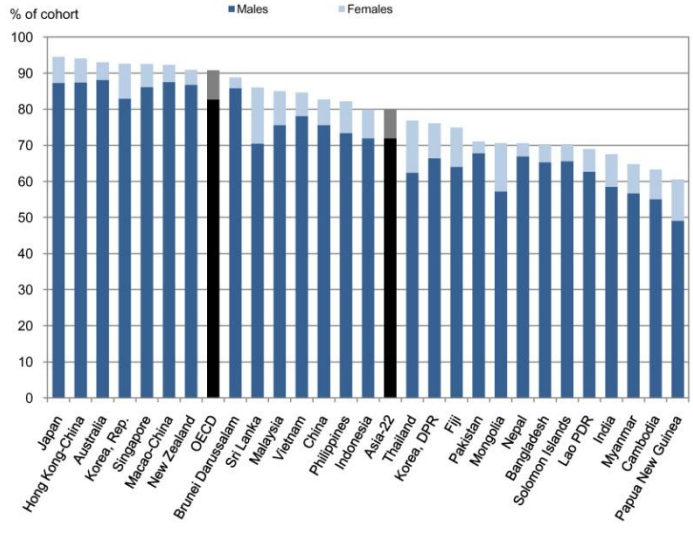
1.1.2. Life expectancy at birth, by sex, 2008



1.1.3. Life expectancy at birth and GNI per capita, 2008



1.1.4. Survival rate to age 65, 2008



Sources: OECD Health Data 2010; The World Bank, World Development Indicators Online.

Infant mortality reflects the effect of economic and social conditions on the health of mothers and new-borns, as well as the effectiveness of health systems. Around two-thirds of the deaths that occur during the first year of life in the region are neonatal deaths (i.e. during the first four weeks of life). Factors such as the health of mothers, maternal care and birth weight are important determinants of infant mortality. Diarrhoea, pneumonia and undernutrition of both mothers and babies are the causes of many deaths.

Countries with higher levels of economic development generally have lower infant mortality rates. In 2008, OECD countries averaged five infant deaths per 1 000 live births; among 19 Asian countries, the average was 30 deaths (Figure 1.2.1). Geographically, infant mortality is lower in eastern Asian countries, and higher in South and Southeast Asia. Singapore, Japan, the Republic of Korea and Australia had rates lower than five deaths per 1 000 live births in 2008, whereas rates in Pakistan, Myanmar, Cambodia, Papua New Guinea and India were greater than 50.

Infant mortality rates have fallen dramatically in the Asia/Pacific region over the last 30 years, with many countries, including China, India and Indonesia, experiencing declines of between 50 and 70% (Figures 1.2.2 and 1.2.3). In Singapore, Malaysia, the Republic of Korea, Vietnam and Thailand, rates have fallen by three-quarters. Falls in Myanmar, the Solomon Islands, Cambodia, Papua New Guinea and Pakistan have been less pronounced, even though these countries had high levels of infant mortality in 1980. This has led to growing gaps between these countries and others in the region.

Inequalities in infant mortality rates also exist within countries (Figure 1.2.4), with the richest population quintile gaining access to key health interventions more quickly than the poorest. Reducing both types of inequity – between and within countries – is crucial for achieving lasting reductions in infant mortality across the Asia/Pacific region.

Infant mortality can be reduced through relatively inexpensive public health campaigns, such as immunization, and offering clean water and sanitation. Oral rehydration therapy helps to save many young lives, and is a cheap and effective means to offset the debilitating effects of diarrhoea, one of the main causes of infant deaths. But to minimise the avoidable tragedy of infant deaths, renewed efforts will be required on a sustainable basis (WHO, 2008a). While it is widely agreed that eradicating poverty is a key factor in reducing mortality rates, debate continues as to whether mortality declines are linked to better nutrition and improvements in preventing premature deaths, or whether more specific government programmes play a central role in changing the health behaviour of individuals (UNICEF, 2008b).

For further reading

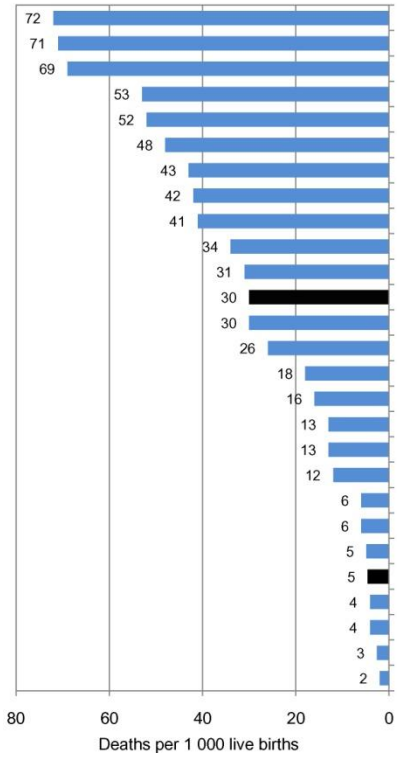
UNICEF (2008), *Tracking Progress in Maternal, Newborn and Child Survival: the 2008 Report*, UNICEF, New York.

Definition and measurement

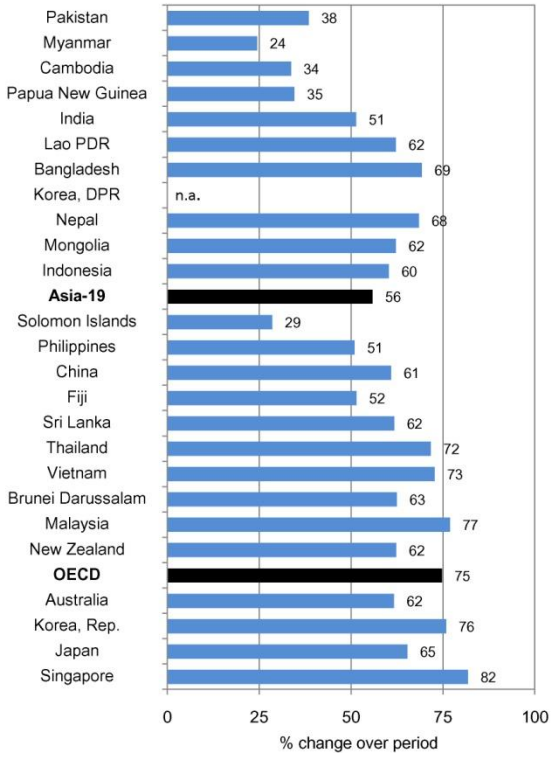
The infant mortality rate is one of the most important statistics for measuring the health of a population. It is defined as the number of children who die before reaching their first birthday in a given year, expressed per 1 000 live births.

Some countries base their infant mortality rates on estimates derived from censuses and surveys, and not on accurate registration of births and deaths. Differences among countries in registering premature infants may also add slightly to international variation in rates.

1.2.1. **Infant mortality rates, 2008**

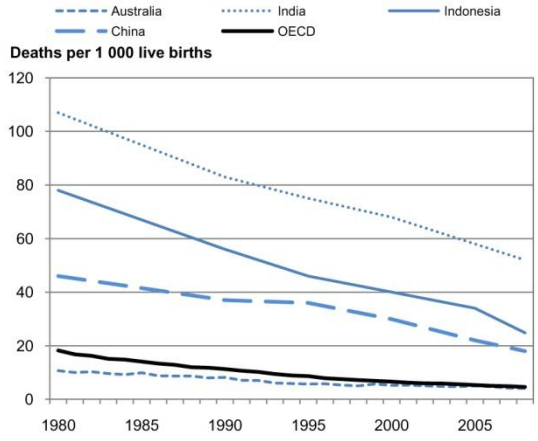


1.2.2. **Decline in infant mortality rates, 1980-2008**



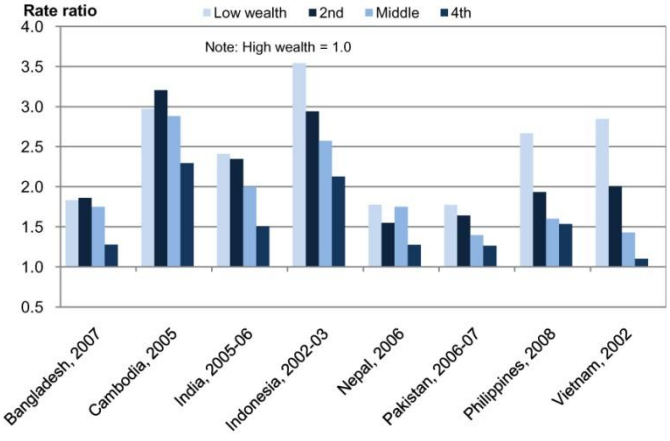
Source: OECD Health Data 2010; UNICEF Childinfo.

1.2.3. **Infant mortality rates, selected countries, 1980-2008**



Source: OECD Health Data 2010; UNICEF Childinfo.

1.2.4. **Infant mortality rate ratios by wealth quintiles, selected countries and years**



Sources: DHS 2006-2009; Gwatkin et al., 2007.

The under-5 mortality rate is another sensitive indicator of both the level of child health and the development and well-being of a population. In 1950-1955, almost one-quarter of all children born worldwide did not reach their fifth birthday. By 1990, this had been lowered to less than one-in-ten. As part of their Millennium Development Goals, the United Nations has set a target of further reducing under-5 mortality by two-thirds between 1990 and 2015 (United Nations, 2009a).

In 2008, 8.8 million children died worldwide before their fifth birthday, and one-third of these deaths (2.9 million) occurred in the Asia/Pacific region (Black *et al.*, 2010). The average under-5 mortality rate across 20 Asian countries was 39 deaths per 1 000 live births (Figure 1.3.1). Singapore, Japan and the Republic of Korea had achieved very low rates (five or under), these being lower than the average across OECD countries (6 deaths per 1 000 live births). Mortality rates in Pakistan, Cambodia and Myanmar, however, were high, approaching 100. Rates are generally lower for females than males, although this is not the case in China, India and the Republic of Korea (WHO, 2008a).

Deaths from causes occurring during the neonatal period (the first four weeks of life), along with diarrhoea, pneumonia and injuries are leading causes of death among children aged under five years (Figure 1.3.2). Around half of all under-5 deaths occur during the neonatal period in the region, and in Brunei Darussalam, New Zealand, Singapore and Thailand, more than 60%.

Substantial progress has been made in reducing under-5 mortality across Asian countries over recent decades (Rajaratnam *et al.*, 2010). From an average of around 100 deaths per 1 000 live births in 1980, rates have fallen to the current value of 39 (Figure 1.3.3). Improvements in China, India and Indonesia are noteworthy, with current rates less than half of 1980 values. However, much of the fall occurred among infants older than four weeks, with very little reduction in the neonatal period (WHO, 2008a; see also Indicator 1.2, "Infant mortality"). Since mortality rates for the post-neonatal period and between ages one and four have limited further scope for improvement, a substantial decline in neonatal deaths will need to occur to meet UN targets for 2015.

As is the case for infant mortality, inequalities in under-5 mortality rates exist both between and within countries, with good care being less accessible to the needy, whether this is measured by rural-urban regions, by level of wealth or by level of maternal education (Figure 1.3.4). For some countries, the difference in the under-5 mortality rates between the poor and rich is vast. For example, in India, children in the poorest 20% of the population are three times more likely to die before their fifth birthday than those in the richest 20%. In recent decades, no country for which trend data are available has managed to reduce inequalities while reducing child mortality (WHO, 2008a). Significant progress in reducing under-5 mortality will depend on gains made among the poorest people in the highest mortality countries.

For further reading

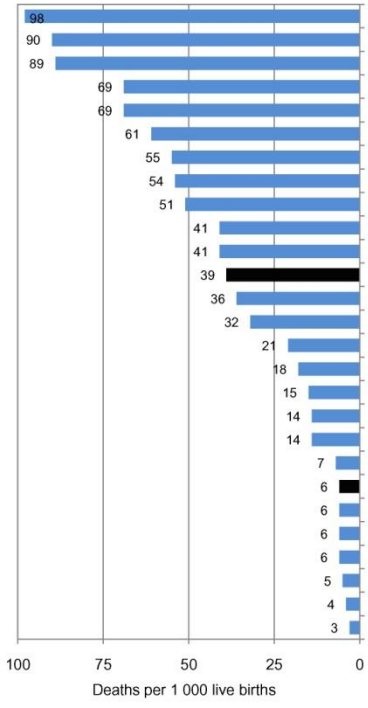
UNICEF (2008), *The State of Asia/Pacific's Children 2008: Child Survival*, UNICEF, New York.

Definition and measurement

Under-5 mortality is defined as the probability of a child born in a given year dying before reaching their fifth birthday, and is expressed per 1 000 live births. Since under-5 mortality is derived from a life table, it is, strictly speaking, not a rate but a probability of death.

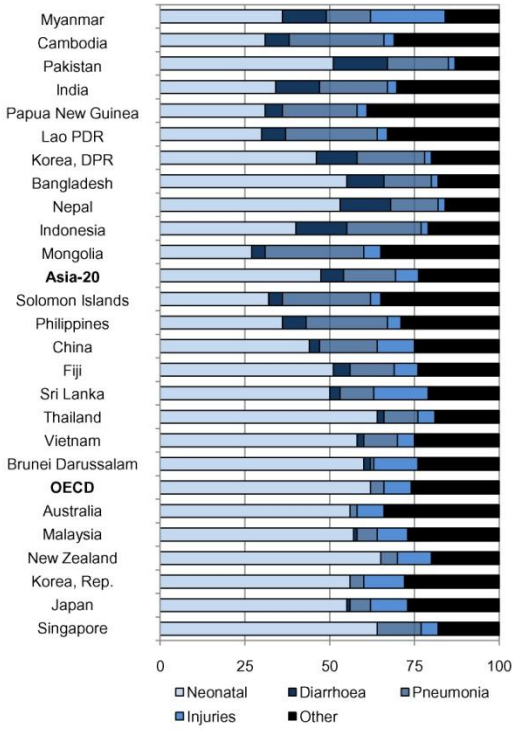
Age-specific mortality rates are required to construct life tables from which under-5 mortality is derived. Some countries base their estimates on censuses and surveys, and not on accurate registration of deaths.

1.3.1. **Under-5 mortality rates, 2008**



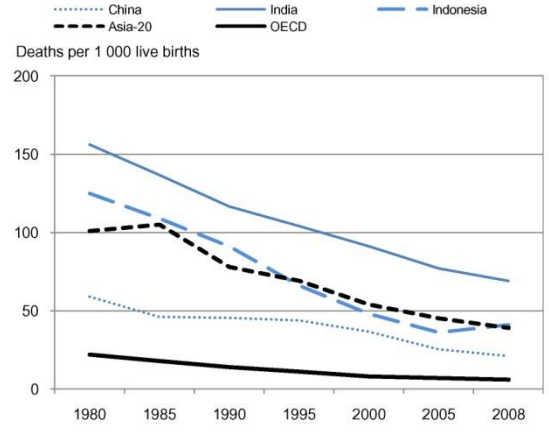
Source: UNICEF Childinfo.

1.3.2. **Distribution of causes of death among children aged under 5 years, 2008 (%)**



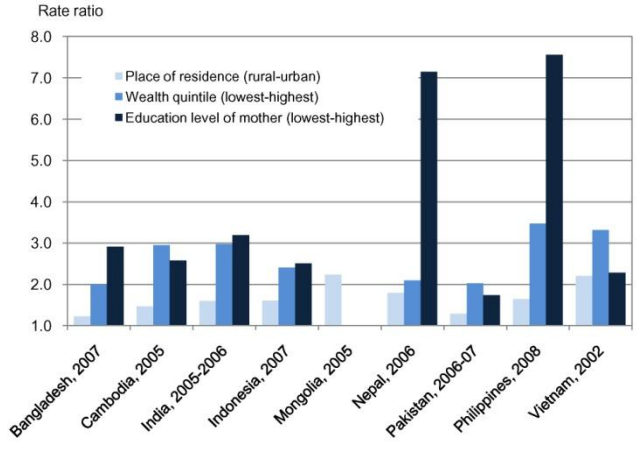
Source: WHO, 2010d.

1.3.3. **Under-5 mortality rates, selected countries, 1980-2008**



Source: UNICEF Childinfo; World Bank WDI.

1.3.4. **Under-5 mortality rate ratios, selected countries and years**



Sources: WHO, 2010d; DHS 2006-2009.

Mortality rates are one of the most common measures of population health. Statistics on important life events such as birth and death remain the most widely available and comparable sources of health information across whole populations, although the coverage, completeness and reliability of these data are problematic for many countries in the Asia/Pacific region. The World Health Organization uses available data and information to derive comparable estimates of mortality and its causes.

There are wide disparities in adult mortality in the region. For males in 2008, the probability of dying between ages 15 and 60 ranged from a low of 81 per 1 000 population in Australia, to 368 per 1 000 in Myanmar (Figure 1.4.1). It also exceeded 300 per 1 000 population in the Lao PDR and Sri Lanka, and was less than 100 not only in Australia, but also in Singapore, Japan and New Zealand. Across 20 Asian countries, the average probability of dying for males aged 15-60 in 2007 was 221 per 1 000 population, almost twice the average in OECD countries (115).

Among females, the probability ranged from 43 per 1 000 population in Japan and the Republic of Korea to a high of 304 in Myanmar. Probabilities also exceeded 200 in the Lao PDR, Nepal, Papua New Guinea, Bangladesh and Cambodia. They were less than 50 not only in Japan, but also the Republic of Korea, Australia and Singapore. Across 20 Asian countries, the average probability of dying for females aged 15-60 in 2008 was 155 per 1 000 population, more than two and a half times the average in OECD countries (58). Disparities between countries for females were greater than those for males.

Estimates of mortality rates by cause of death are available for the year 2004. Non-communicable diseases such as cardiovascular diseases and cancers are the most common causes of death, being responsible for about two-thirds of all deaths, on average, across 20 Asian countries (Figure 1.4.2). In OECD countries, the average is higher at 86% (see also Indicator 1.5, "Mortality from cardiovascular diseases", and Indicator 1.6, "Mortality from cancer"). Injuries are responsible for between 5-10% of all deaths, but this figure rises when widespread natural disasters such as the 2004 tsunami occur, as happened in Sri Lanka (see Indicator 1.7, "Mortality from injuries").

Communicable diseases such as respiratory infections, diarrhoeal diseases and tuberculosis, along with maternal and perinatal conditions, remain major causes of death among many countries in the region (Figure 1.4.3). Increasing development in countries brings an 'epidemiological transition', whereby communicable diseases are replaced by non-communicable diseases, and early deaths by late deaths (WHO, 2008a).

For further reading

WHO (2008), *Health in Asia and the Pacific,* World Health Organization, Regional Office for Southeast Asia, New Delhi.

Definition and measurement

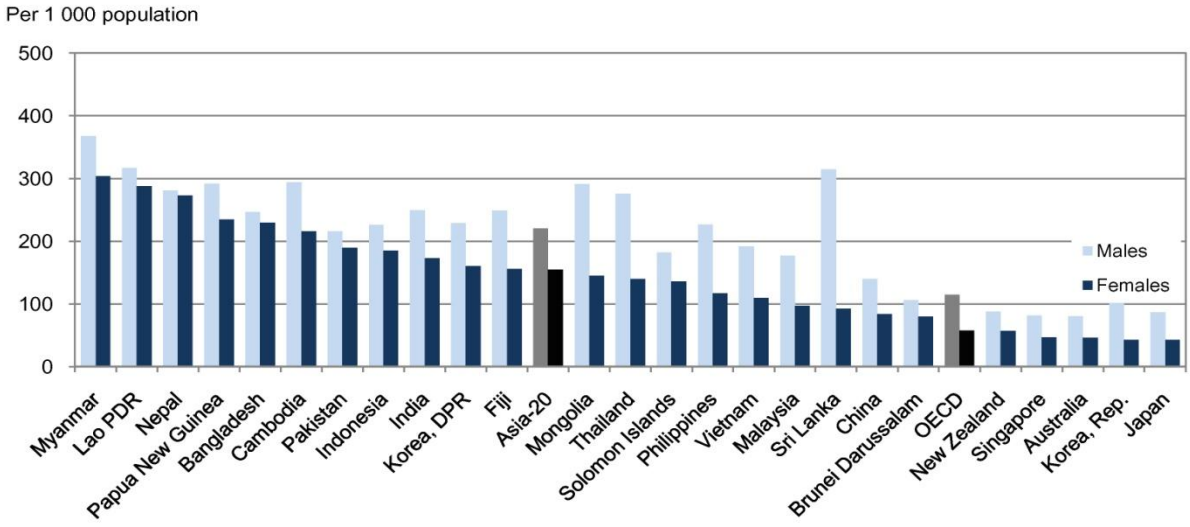
Mortality rates are calculated by dividing annual numbers of deaths by mid-year population estimates. Rates have been age-standardised to the World Standard Population to remove variations arising from differences in age structures across countries.

Complete vital registration systems do not exist in many developing countries, and about one-third of countries in the region do not have recent data (WHO, 2008a). Misclassification of causes of death is also an issue. A general assessment of the coverage, completeness and reliability of causes of death data has been published by WHO (Mathers *et al.*, 2005).

The WHO Global Burden of Disease project draws on a wide range of data sources to quantify global and regional effects of diseases, injuries and risk factors on population health. The latest assessment of GBD is for 2004. WHO has also developed life tables for all Member States, based on a systematic review of all available evidence on mortality levels and trends. The probability of dying between 15 and 60 years of age (adult mortality rate) derive from these life tables.

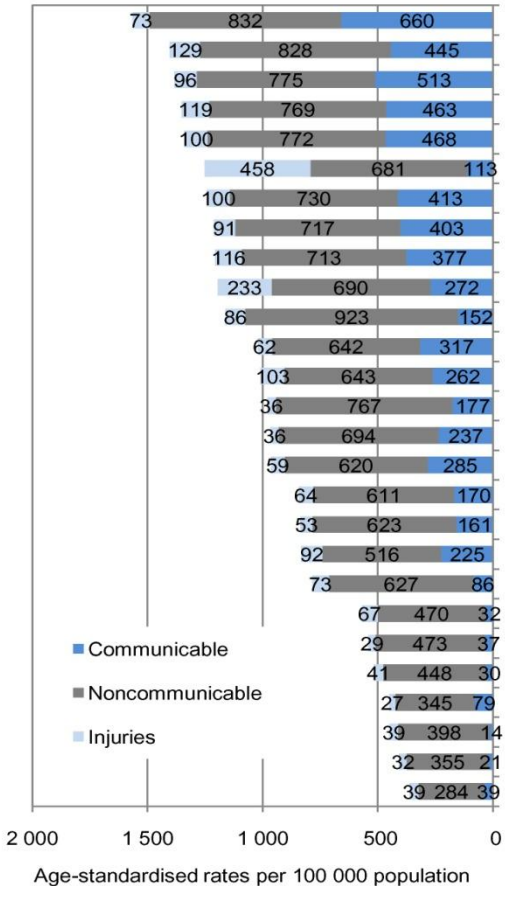
Mortality rates reported here represent the best estimate of WHO - based on evidence available in 2008 - rather than official estimates of their Member States. The estimates have been calculated using standard categories and methods to ensure cross-national comparability. Therefore, they are not always the same as official national estimates, nor necessarily endorsed by Member States. Official Korean national estimates, for example, are lower than WHO estimates.

1.4.1. **Adult mortality rate, 2008 (probability of dying between 15 and 60 years per 1 000 population)**

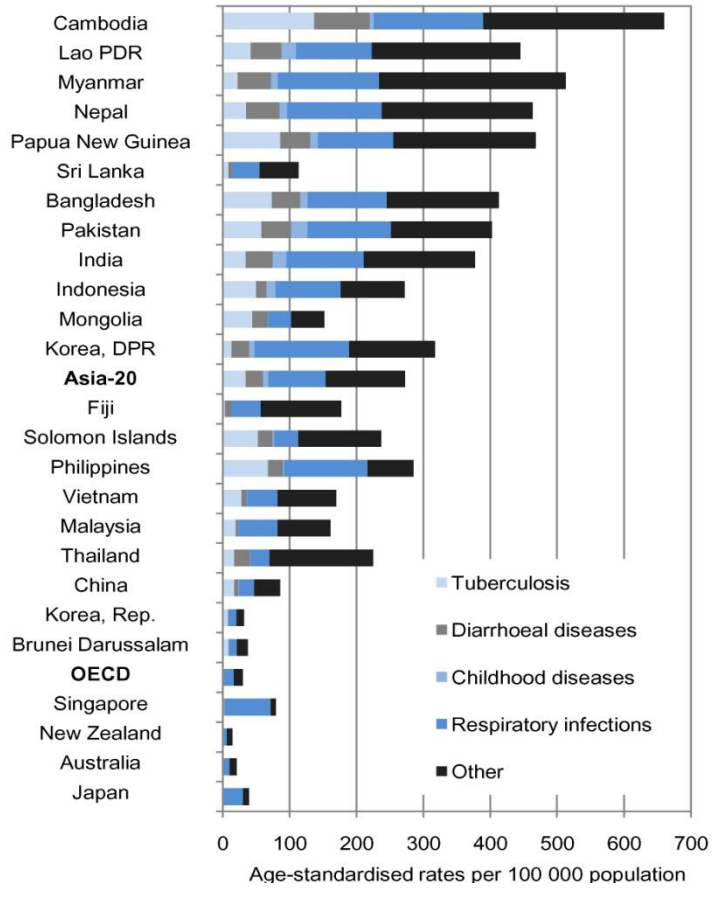


Source: WHO, 2010d.

1.4.2. **Estimated mortality rates by cause, 2004**



1.4.3. **Estimated mortality rates due to communicable diseases, 2004**



Source: WHO Global Burden of Disease, 2008.

Cardiovascular disease has long been the main cause of death in developed countries, but it has become increasingly prevalent in recent decades in Asia/Pacific countries as well. It now accounts for about one-third of all deaths across the region. Cardiovascular disease covers a range of diseases related to the circulatory system, including ischaemic heart disease (known as IHD, or heart attack) and cerebrovascular disease (or stroke). Together, IHD and stroke comprise over 70% of all cardiovascular deaths in the twenty Asian countries included here.

Estimates for the year 2004 indicate high levels of death from cardiovascular disease - exceeding 400 deaths per 100 000 population - in a large group of countries, including Mongolia, Lao PDR and Fiji (Figure 1.5.1). This is in contrast to a group of developed countries (Japan, Australia, New Zealand, Singapore, Republic of Korea) where death rates were below 200 per 100 000 population. Mortality rates from cardiovascular disease are half as much again in Asian countries as in OECD countries (314 versus 201 deaths per 100 000 population).

Rates of cardiovascular disease increase with age (Figure 1.5.3). Among younger age groups (0-29 years), rates are higher in Southeast Asian countries, but rates of mortality among middle- and older-aged persons are higher in European countries. Mortality rates are lower at all ages in Western Pacific region countries.

The types of cardiovascular diseases that are fatal to persons in the region differ across countries. In countries such as Japan, the Republic of Korea, China, Thailand, Vietnam and Mongolia, morbidity and mortality from stroke is greater than from ischaemic heart disease (Figure 1.5.2). In European and North American countries, but also in Singapore, India, Pakistan and Bangladesh, the opposite is true (Ueshima *et al.*, 2008). This can largely be explained by differences in levels of risk factors for cardiovascular disease across countries. In most Asian countries, cholesterol levels tend to be lower than European and North American countries, but up to two-thirds of cardiovascular disease can be attributed to hypertension, reinforcing the importance of blood pressure often accompanies high salt intake, whereas low cholesterol levels are associated with lower fat intake. In China, average daily salt intake for men in 2002 was 12g per day, approximately twice the level recommended by Chinese dietary guidelines (Herd *et al.*, 2010)

As the proportion of aged persons increases in the Asia/Pacific region, up to half of the world's cardiovascular burden can be expected to occur in the area (Sasayama, 2008). Increases in total cholesterol and blood pressure, along with smoking, overweight/obesity and diabetes highlight the need for management of risk factors to forestall an epidemic of cardiovascular disease.

For further reading

Ueshima, H. *et al.* (2008), "Cardiovascular Disease and Risk Factors in Asia: A Selected Review", *Circulation*, Vol. 118, No. 25, pp. 2702-2709.

Definition and measurement

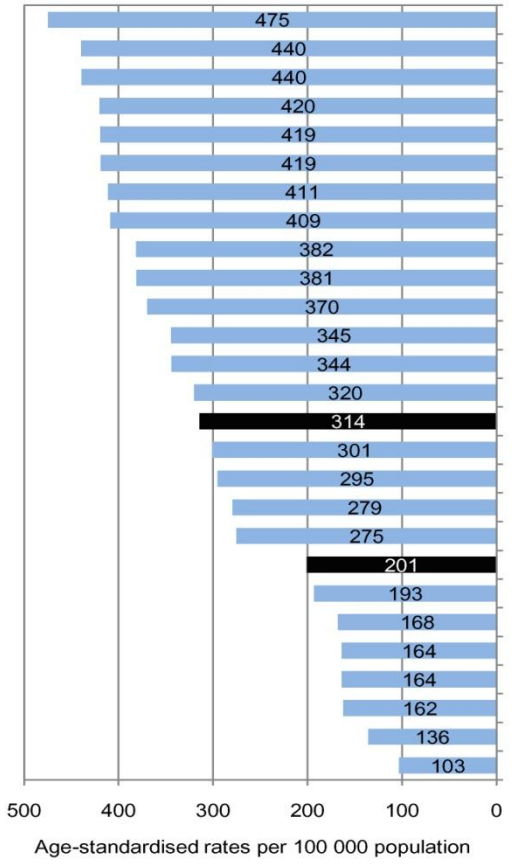
Mortality rates are calculated by dividing annual numbers of deaths by mid-year population estimates. Rates have been age-standardised to the World Standard Population to remove variations arising from differences in age structures across countries.

Complete vital registration systems do not exist in many developing countries, and about one-third of countries in the region do not have recent data (WHO, 2008a). Misclassification of causes of death is also an issue. A general assessment of the coverage, completeness and reliability of causes of death data has been published by WHO (Mathers *et al.*, 2005).

The WHO Global Burden of Disease project draws on a wide range of data sources to quantify global and regional effects of diseases, injuries and risk factors on population health. The latest assessment of GBD is for 2004.

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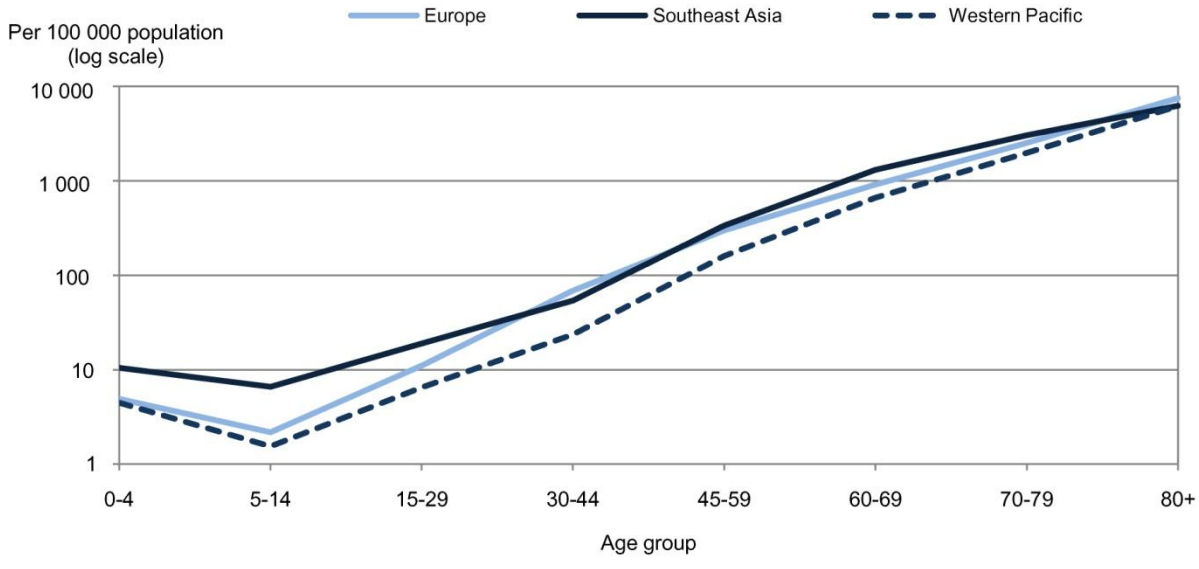
1.5.1. **Cardiovascular disease, estimated mortality rates, 2004**



1.5.2. **Proportion of cardiovascular diseases, 2004**



1.5.3. **Cardiovascular disease, age-specific mortality rates by region, 2004**



Source: WHO Global Burden of Disease, 2008.

Cancer is a leading cause of death worldwide. Cancer was the cause of an estimated 3.6 million deaths (or 13% of total deaths) in Asia/Pacific countries in 2008. Cancer deaths in the region total almost half of all worldwide cancer deaths (Boyle and Levin, 2008).

Countries with higher cancer mortality rates, based on 2004 estimates, include the Republic of Korea, Cambodia, China and the Lao PDR, all with over 140 deaths per 100 000 population (Figure 1.6.1). However, the country with the highest rate was Mongolia, at almost 300 deaths per 100 000 population. A large proportion of this was due to deaths from liver cancer, precipitated by hepatitis B infection.

Cancer deaths were less common in the Solomon Islands, Fiji, the Philippines, the Democratic People's Republic of Korea and India, with 100 deaths per 100 000 population or less. The average rate of death in twenty Asian countries was slightly lower than that in OECD countries (129 versus 141 deaths per 100 000 population). Cancer also accounts for a much higher proportion of deaths in OECD countries, at 27% in 2006 (OECD, 2009).

Age-specific mortality rates in European countries are similar to those in the Western Pacific region (Figure 1.6.3). Rates in Southeast Asian countries are lower than for Europe and the Western Pacific after the age of 30.

Lung cancer remains the main cause of cancer mortality, averaging 17% of all cancers in 20 Asian countries. Rates are comparatively high in Bangladesh, Myanmar and Singapore (Figure 1.6.2). It is anticipated that rates will continue to rise if strong anti-smoking initiatives are not undertaken. Mortality from stomach cancer is also common, largely caused by *Helicobactor pylori* infection, with deaths more prevalent in the Democratic People's Republic of Korea, China and the Republic of Korea.

Besides Mongolia, liver cancer deaths occur more frequently in Thailand, Lao PDR and China. Incidence is expected to fall in coming decades, with increased immunization for hepatitis B. Colorectal cancer deaths are higher in Singapore, New Zealand and Malaysia. Breast cancer deaths, the most common cause among women, are responsible for more than 10% of all cancer deaths in Pakistan, Fiji, the Philippines and Indonesia. Although early detection and therapy can reduce mortality, these services are inaccessible to large numbers of women in the region (WHO, 2008a).

As with cardiovascular disease, an ageing population will lead to many more cases of cancer in coming decades, and Asia alone can expect up to five million annual cancer deaths by 2030, taxing underprepared health systems. Since the drugs and technologies for treating patients are expensive, cancer control planning in the Asia/Pacific region might more effectively target smoking, physical activity, overweight/obesity and nutrition.

For further reading

Boyle, P. and B. Levin (eds.) (2008), *World Cancer Report 2008*, WHO/IARC, Lyon.

Definition and measurement

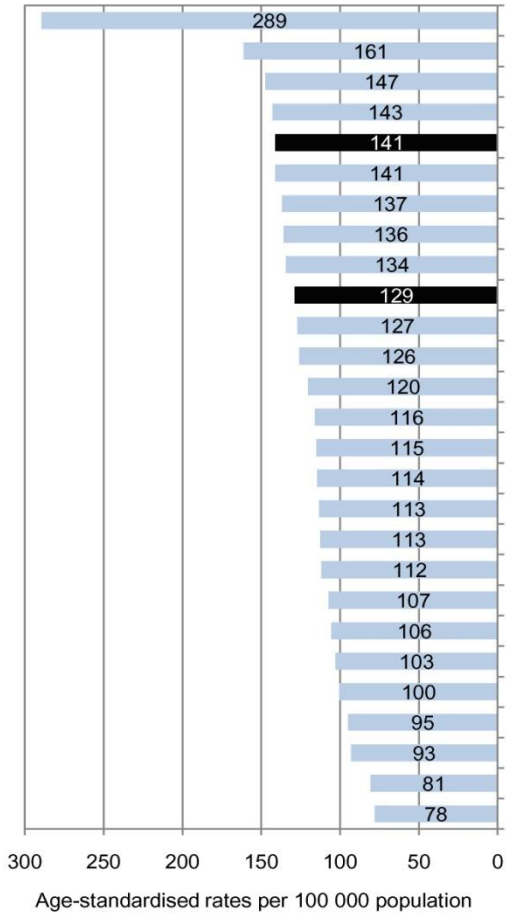
Mortality rates are calculated by dividing annual numbers of deaths by mid-year population estimates. Rates have been age-standardised to the World Standard Population to remove variations arising from differences in age structures across countries.

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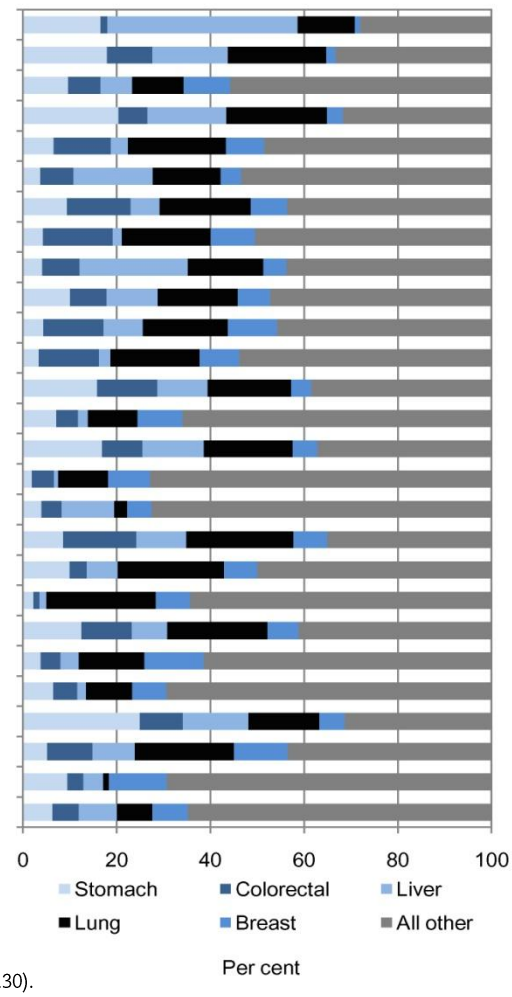
The WHO Global Burden of Disease project draws on a wide range of data sources to quantify global and regional effects of diseases, injuries and risk factors on population health. The latest assessment of GBD is for 2004.

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1.6.1. **All cancers, estimated mortality rates, 2004**

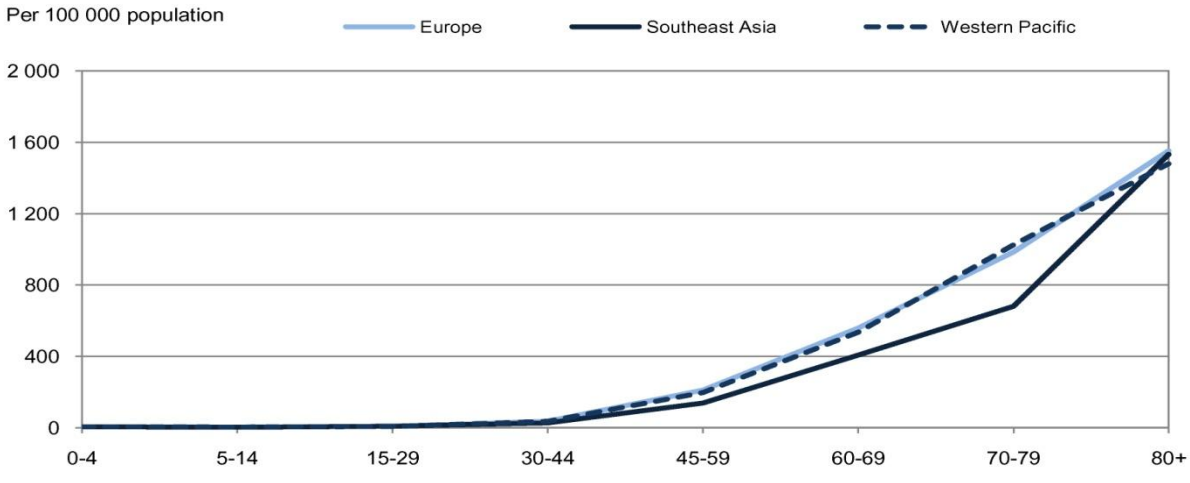


1.6.2. **Proportion of cancers, 2004**



[1] WHO estimates are significantly higher than official national estimates (130).

1.6.3. **All cancers, age-specific mortality rates by region, 2004**



Source: WHO Global Burden of Disease, 2008.

Injury is a leading cause of death and disability for all age groups up to age 60 years, causing around six million deaths annually. In the Asia/Pacific region, it is estimated that injuries caused about 3.1 million deaths in 2004, or over 8 600 deaths daily, which constituted 55% of worldwide injury deaths. However, the magnitude of the problem varies considerably across countries by cause, age, sex, and income group.

Developing countries have injury-related mortality rates that are higher than developed countries. Among a group of 20 Asian countries, average injury mortality was estimated to be over 100 deaths per 100 000 population in 2004 (Figure 1.7.1). Sri Lanka and Indonesia both had high mortality rates in this year, although this was largely due to the effects of the catastrophic December 2004 tsunami, which killed over 230 000 persons. But even if these countries are excluded, injury mortality in Asian countries averages more than twice that in OECD countries. Among a group of largely developed countries, including Singapore, Australia and Japan, injury mortality was lower than 50 deaths per 100 000 population.

Over half of all injury-related mortality occurs in the 5-44 years age group. Countries in the European and Western Pacific region (which includes Japan, New Zealand and Australia) have largely similar age-specific mortality rates (Figure 1.7.3). Mortality rates in the Southeast Asian region tend to be higher than in these other two regions from the age of 45 years onwards.

The causes of injury deaths differ across countries in the region. In Brunei Darussalam, Mongolia and Malaysia, one-third or more of all injury deaths are due to road traffic accidents (Figure 1.7.2). However because of their population size, the two leading countries with the highest numbers of road traffic deaths worldwide are China and India (WHO, 2009a). In Japan, Singapore and the Republic of Korea, self-inflicted injuries are the leading cause of injury mortality. In Nepal, acts of war were responsible for many deaths in 2004. Deaths from interpersonal violence are more common in the Philippines, the Democratic People's Republic of Korea and Cambodia. Apart from road traffic injuries, drowning and fire-related burns are also leading causes of injury-related deaths among children in the region (Peden *et al.*, 2008).

Injury deaths, both intentional and unintentional, are largely preventable events (Peden *et al.*, 2002). Some countries, including China, have developed national policies and programmes for prevention, and others have begun public awareness campaigns. ASEAN countries, for instance, in collaboration with the Asian Development Bank, are implementing action plans for road safety (WHO, 2008a). However, injury mortality remains a significant public health problem in the region.

For further reading

Peden, M., K. McGee and E. Krug (eds.) (2002), *Injury, A Leading Cause of the Global Burden of Disease, 2000,* World Health Organization, Geneva.

Definition and measurement

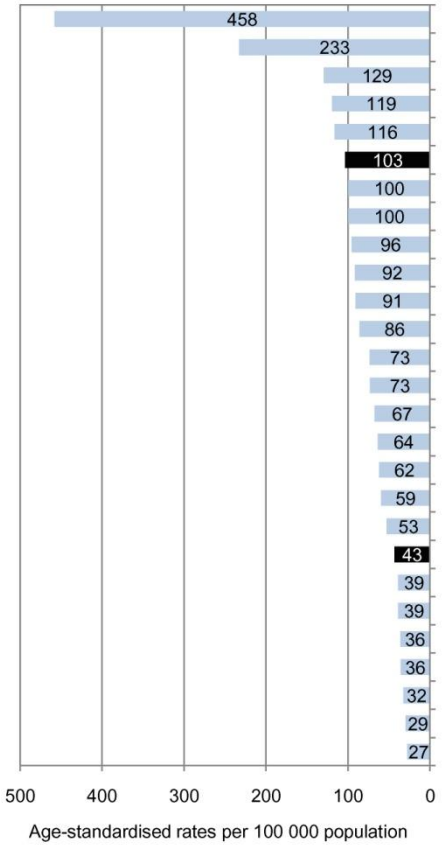
Mortality rates are calculated by dividing annual numbers of deaths by mid-year population estimates. Rates have been age-standardised to the World Standard Population to remove variations arising from differences in age structures across countries.

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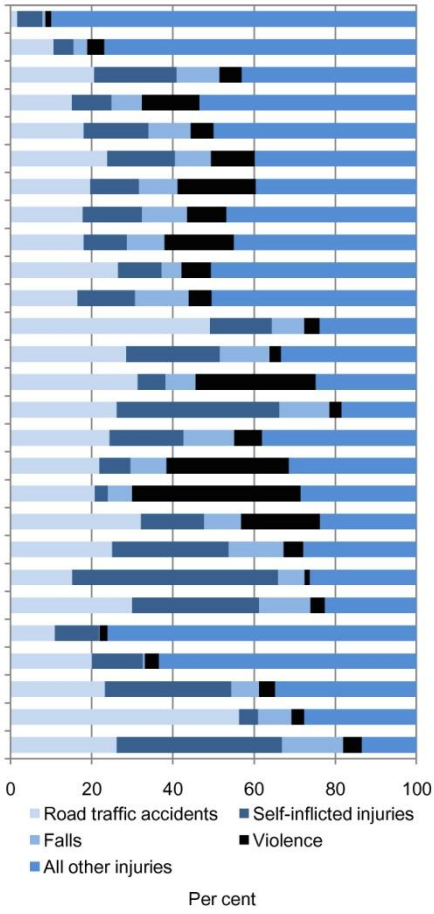
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1.7.1. **Injuries, estimated mortality rates, 2004**

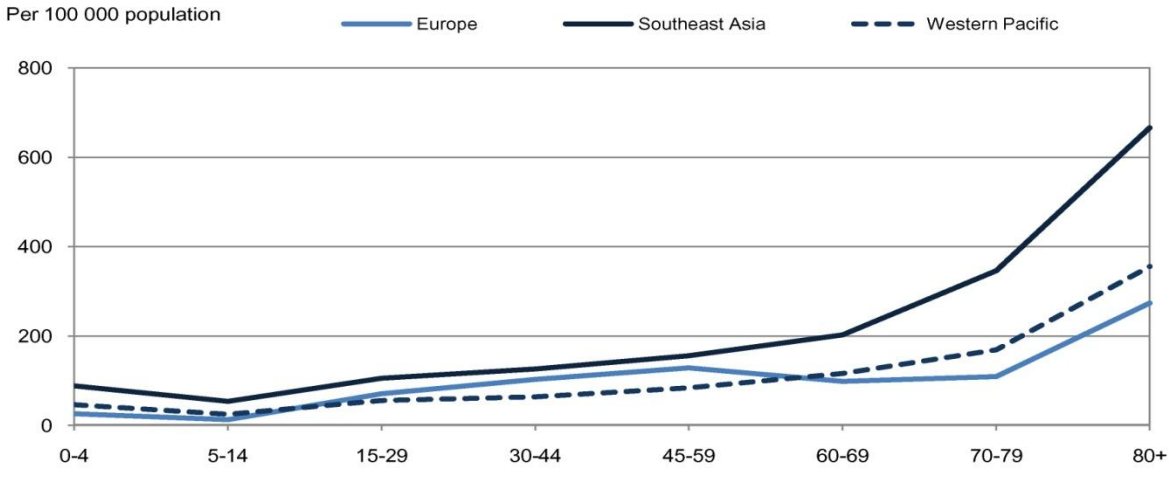


1.7.2. **Proportion of injuries, 2004**



Note: High rates in Sri Lanka and Indonesia are due to the catastrophic tsunami of December 2004.

1.7.3. **Injuries, age-specific mortality rates by region, 2004**



Source: WHO Global Burden of Disease, 2008.

In different countries and to varying extents, pregnancy and childbirth have inherent risks. Maternal mortality – the death of a woman during pregnancy, childbirth, or in the weeks after delivery – is an important indicator of woman's health and status. It shows clearly the differences between rich and poor, with the vast majority of deaths occurring in developing countries (WHO, 2009d). Fertility and maternal mortality have strong associations with economic development and GDP.

In developed countries, the maternal mortality ratio (MMR) averages around ten deaths per 100 000 live births; in disadvantaged countries, it is an order of magnitude greater (Figure 1.8.1). Estimates for 2008 show a small group of countries (Japan, Australia, Singapore, New Zealand, Republic of Korea, Brunei Darussalam, Fiji) with very low MMR, and a second group, including China, Sri Lanka, Thailand, Vietnam and the Philippines, with MMR between 30-100 (WHO, 2010b). A larger group of countries, including India, Indonesia, Pakistan and Bangladesh, have MMR above 200 deaths per 100 000 live births.

Almost 360 000 maternal deaths were estimated to have occurred worldwide in 2008. More than one-quarter of the world's maternal mortality burden (100 000 deaths) occurred in India, Pakistan, Bangladesh and Indonesia alone. Large numbers of maternal deaths also occurred in China (Figure 1.8.2).

However, significant progress in reducing maternal mortality has occurred in the region over the last two decades (Figure 1.8.3). Average MMR across 20 Asian countries has been halved, from an estimated 340 deaths per 100 000 live births in 1990, to 162 in 2008, although this figure is affected by countries with very high MMR. India, Pakistan, Bangladesh, Indonesia and China have all seen significant falls in maternal mortality; in China's case falling by two-thirds, from 110 deaths per 100 000 live births in 1990 to 38 in 2008. The Democratic People's Republic of Korea and Papua New Guinea have seen less progress.

Increased fertility presents a greater lifetime risk for women in Asia/Pacific countries. Yet maternal death is not inevitable, and can be reduced through increased use of contraception, better access to high-quality health care, and greater education and status for women. Although almost all births in countries such as the Democratic People's Republic of Korea, Sri Lanka and Thailand are attended by skilled health professionals, there are several countries in the region (including Bangladesh, Lao PDR and Nepal) where the proportion is less than one in five (see Indicator 3.4). The lack of social status for girls and women in some countries in turn limits their prospects for education, economic resources and decision making. Renewed efforts will need to be undertaken by countries in the region if the WHO Millennium Development Goal of reducing MMR by three-quarters from 1990 to 2015 is to be met.

For further reading

WHO (2010), *Trends in Maternal Mortality: 1990 to 2008*, World Health Organization, Geneva.

Hogan, M. C. *et al.* (2010), "Maternal Mortality for 181 Countries, 1980-2008: A Systematic Analysis of Progress Towards Millennium Development Goal 5", *The Lancet*, Vol. 375, No. 9726, pp. 1609-1623.

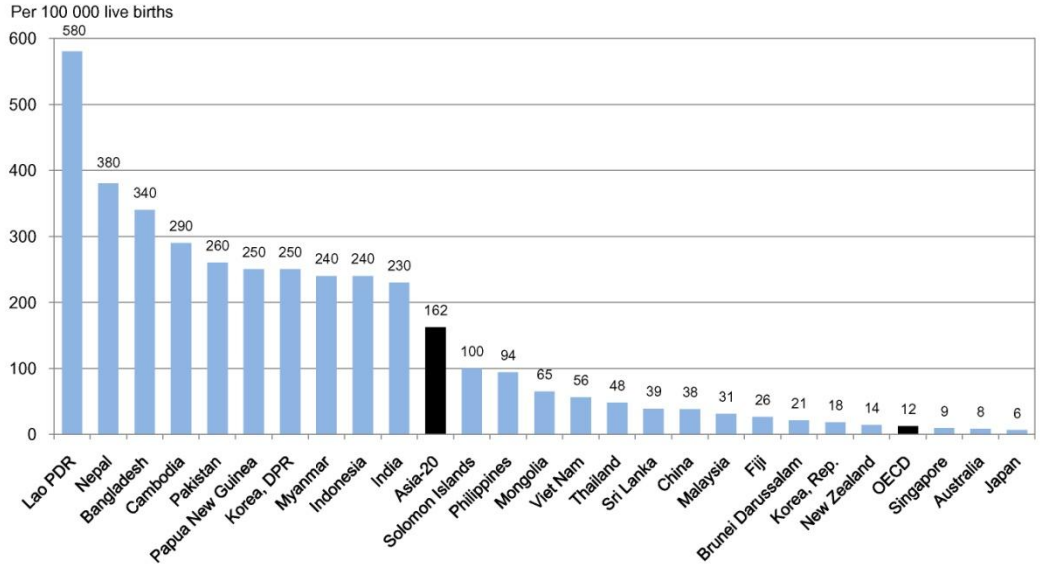
Definition and measurement

Maternal mortality is defined as the death of a woman during pregnancy or childbirth or in the 42 days after delivery from any cause that was related to or aggravated by the pregnancy (WHO, 2007a). This includes direct deaths from obstetric complications of pregnancy, interventions, omissions or incorrect treatment. It also includes indirect deaths due to previously existing diseases, or diseases that developed during pregnancy, where these were aggravated by the effects of pregnancy.

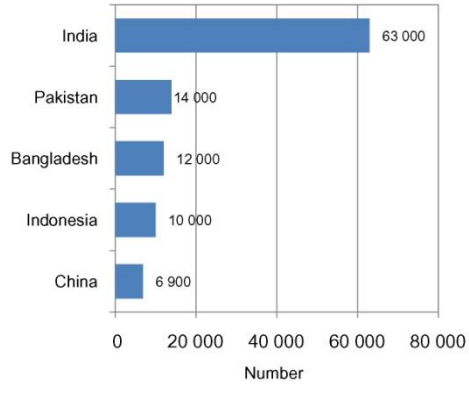
Maternal mortality is here measured using the maternal mortality ratio (MMR), i.e. the number of maternal deaths in a population divided by the number of live births. MMR assesses the risk of maternal death relative to the number of live births.

There are difficulties in identifying maternal deaths precisely. Many countries in the region do not have complete and accurate vital registration systems, and so the MMR is derived from other sources, including censuses, household surveys, sibling histories, verbal autopsies and statistical studies. Because of this, estimates should be treated cautiously.

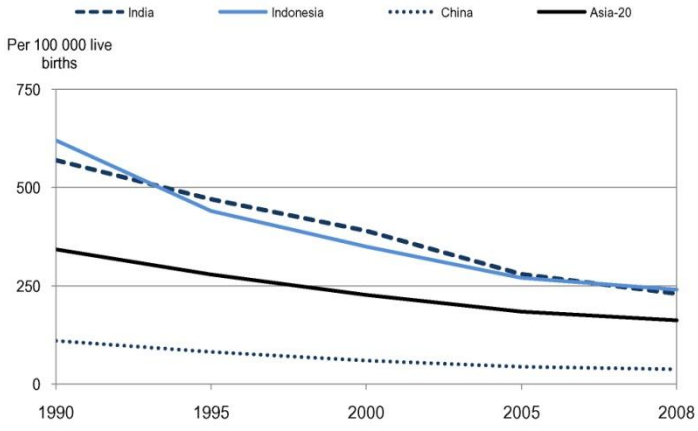
1.8.1. **Estimated maternal mortality ratio, 2008**



1.8.2. **Estimated number of maternal deaths in 5 leading countries, 2008**



1.8.3. **Estimated maternal mortality ratios, selected countries, 1980-2008**



Source: WHO, 2010c.

Although the first cases of AIDS in Asia were reported in 1984 and 1985, the more extensive spread of HIV began late compared with the rest of the world, occurring in Cambodia, India, Myanmar and Thailand in the early 1990s (Ruxrungtham *et al.*, 2004). But by 2007, 4.7 million people in the region were living with HIV/AIDS, with about half of these in India. In this year alone, there were 420 000 new infections and 293 000 deaths.

Asia is second only to sub-Saharan Africa as the location with the greatest number of people with HIV. Most of Asia's epidemic occurs among sex workers and their clients, men who have sex with men and injecting drug users. Gay men in Asia face odds of nearly one in five of being infected with HIV during their lifetime. However, HIV is also spreading through transmission to the sexual partners of those at risk.

About 0.3% of the adult population in the Asia/Pacific region have HIV infection. Prevalence in Pacific countries is generally very low, although Papua New Guinea is an exception at 1.4% of the population (Figure 1.9.1). Thailand is the only other Asia/Pacific country where adult HIV prevalence exceeds 1%. Cambodia and Myanmar have comparatively high rates, greater than 500 per 100 000 population. This is in contrast to a number of countries where rates are less than one-tenth of that figure - Japan, Bangladesh, the Philippines, Sri Lanka, the Republic of Korea and New Zealand – all at less than 50 per 100 000 population.

More than 2.4 million people in India were living with HIV in 2007, a number greater than in all OECD countries combined (Figure 1.9.2). China (700 000), Thailand (610 000) and Vietnam, Indonesia and Myanmar (each more than 200 000) face significant disease burdens. It is estimated that fewer than one in three people living with HIV in China has been diagnosed (UNAIDS, 2009). HIV prevalence is increasing in some parts of the region, including Bangladesh, Pakistan and Papua New Guinea. Women are also increasingly likely to be affected, rising from 19% of those living with HIV in 2000, to 35% in 2008 (UNAIDS, 2009).

Almost all countries have instituted HIV awareness programmes to inform the public about the threat of HIV/AIDS. But the level of HIV knowledge among young people varies markedly across countries according to surveys (Figure 1.9.3). A majority of young people at higher risk knew that condoms can protect against sexual HIV transmission, although fewer than half of young people surveyed in Papua New Guinea reported using a condom during their last sexual encounter (UNAIDS, 2009).

Around one-third of persons needing antiretroviral treatment (ART) in Asia receive it. However, this figure varies markedly across countries, from less than 10% in Pakistan, Nepal and Bangladesh, to almost all people (95%) in the Lao PDR (Figure 1.9.4). The Lao PDR's National Socioeconomic Development Plan for 2006–2010 addressed HIV/AIDS, and indicated the government's commitment to expanding the national response to the disease. In India, the country with the greatest disease burden, only 10% of people living with advanced HIV infection receive ART.

For further reading

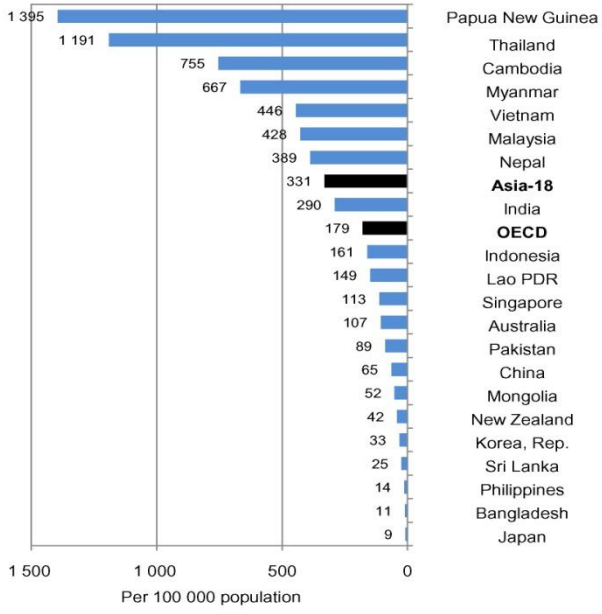
UNAIDS (2009), *AIDS Epidemic Update: November 2009,* Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization, Geneva.

Definition and measurement

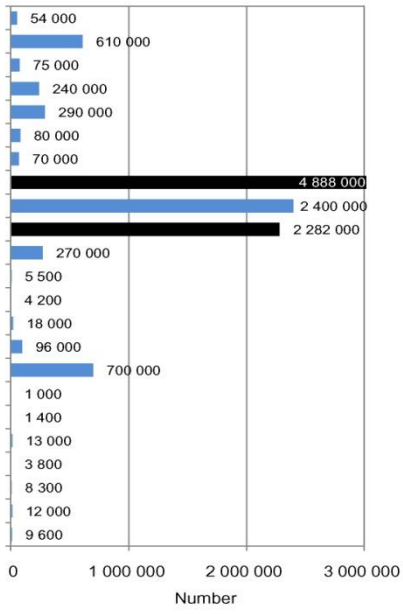
Acquired immunodeficiency syndrome, or AIDS, is a disease of the body's immune system caused by the human immunodeficiency virus (HIV). A person who tests positive for HIV is considered to have progressed to AIDS when a laboratory test shows that their immune system is severely weakened by the virus, or when they develop at least one of a number of different opportunistic infections.

The HIV prevalence rate is the total number of persons estimated to be living with the disease at a particular time, per 100 000 population.

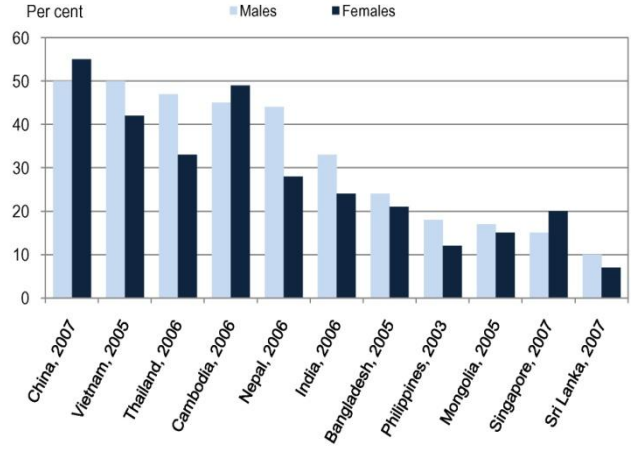
1.9.1. **Prevalence of HIV among adults aged 15 years or more, 2007**



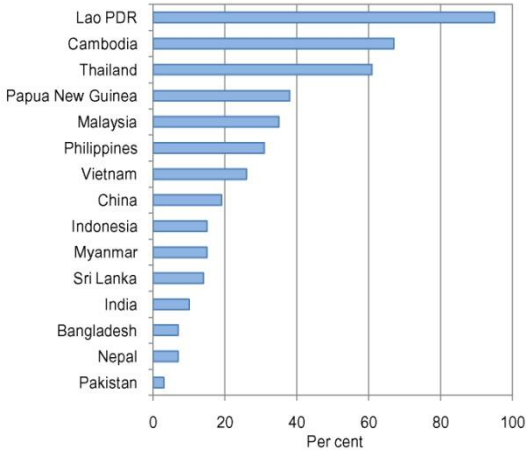
1.9.2. **Estimated number of people living with HIV, 2007**



1.9.3. **Young people aged 15-24 with comprehensive knowledge of HIV/AIDS**



1.9.4. **Persons with advanced HIV infection receiving antiretroviral therapy (ART), 2006-2007**



Source: UNAIDS, 2008.

One of the most widespread infectious diseases in Asia and the Pacific is tuberculosis. About five million cases occur in the region every year, claiming the lives of 800 000 people, more than all other infectious diseases combined (WHO, 2008a). In addition, some two million cases are undetected and untreated. Over half of the world's burden of tuberculosis (around six million prevalent cases) is found in the region.

TB is a disease of poverty and is most common during people's productive years. It has a huge economic, as well as social impact. In 2006, TB caused India to lose an estimated 23.7 billion US dollars (Nair *et al.*, 2010). It can lead to catastrophic out-of-pocket expenditure, with 3-4 months lost wages due to illness-related absence from work not uncommon. Tuberculosis was declared a global health emergency by WHO in 1993.

New cases of TB occurred most often in Cambodia and Myanmar, at over 400 new detections per 100 000 population in 2008 (Figure 1.10.1). Incidence rates were also high in the Democratic People's Republic of Korea, the Philippines and Papua New Guinea. In 2008, Cambodia and the Philippines were the countries with the greatest TB disease burden, with prevalence rates of 680 and 542 per 100 000 population respectively. Myanmar, Bangladesh and Pakistan also had rates over 300 per 100 000 population in 2008. The average prevalence rate across 22 Asian countries was 176, more than 20 times that in OECD countries. Australia, New Zealand and Japan had TB prevalence rates of less than 20.

But in terms of sheer numbers, India and China were the countries with largest number of persons with TB (Figure 1.10.2). In India, 2.2 million persons were living with the disease, and in China, 1.2 million. Bangladesh, Pakistan, the Philippines and Indonesia also had half a million or more sufferers.

The Asia/Pacific region is rising to the challenges presented by TB, with incidence, prevalence and mortality declining steadily since 1990. Between 1998 and 2008, the prevalence per 100 000 population fell from 330 to 220 (Figure 1.10.3). China and Indonesia have seen significant declines, although progress in India has slowed.

The treatment strategy for TB is the "directly observed treatment – short course" program, or DOTS. High-quality TB services have expanded throughout the region, and case detection had exceeded 69% by 2008. DOTS treatment success rates have consistently surpassed 85% since 2003 (Nair *et al.*, 2010) (Figure 1.10.4).

The region faces important challenges to TB control, including providing services to those in greatest need, especially the poor and vulnerable. HIV-TB co-infection, the emergence of drug-resistant strains and the need for greater technical expertise in developing countries all threaten to halt progress.

For further reading

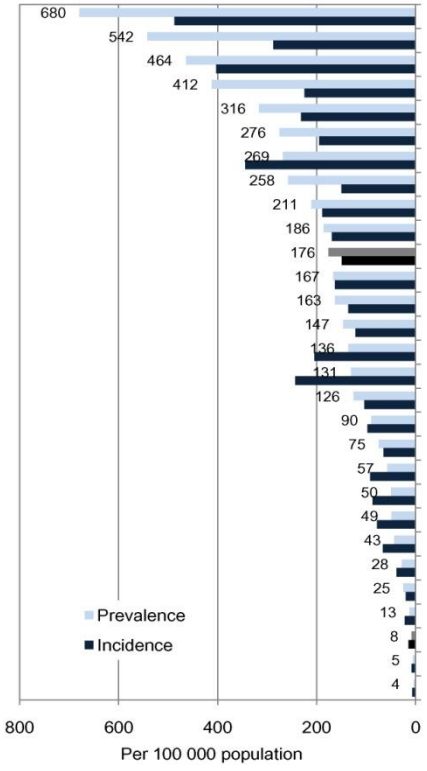
WHO (2008), *Health in Asia and the Pacific*, World Health Organization, Regional Office for Southeast Asia, New Delhi.

Definition and measurement

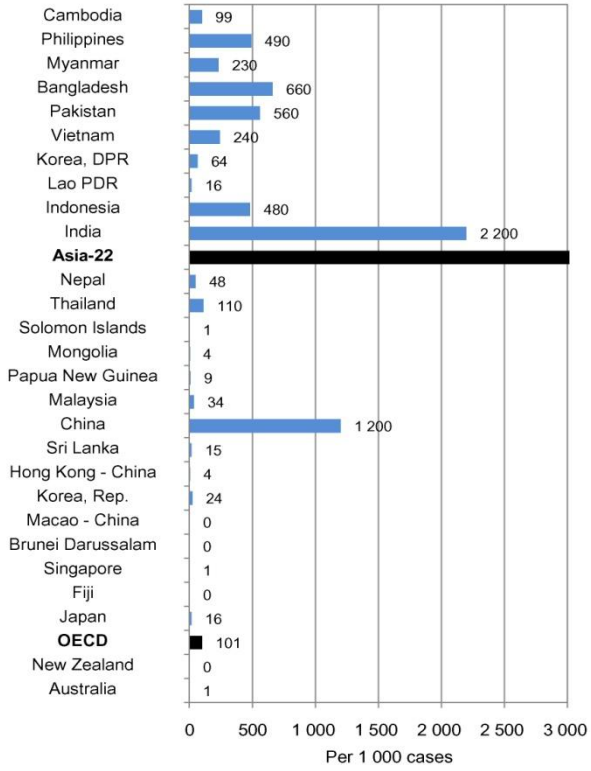
Tuberculosis (TB) is a contagious disease, most often caused by the *Mycobacterium tuberculosis* bacteria in humans. Tuberculosis usually attacks the lungs but can also affect other parts of the body. It is spread through the air, when people who have the disease cough, sneeze, talk or spit. Most infections in humans are latent and without symptoms, with about one in ten latent infections eventually progressing to active disease. If left untreated, active TB kills more than 50% of its victims.

The TB incidence rate is the number of new cases of the disease reported in a year, per 100 000 population. The TB prevalence rate is the total number of persons with the disease at a particular time, per 100 000 population.

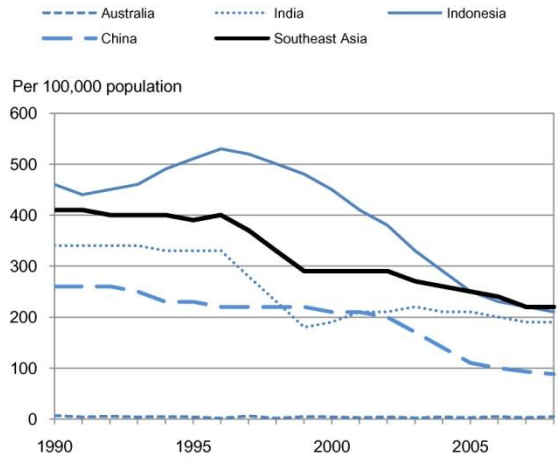
1.10.1. **Tuberculosis prevalence and incidence, 2008**



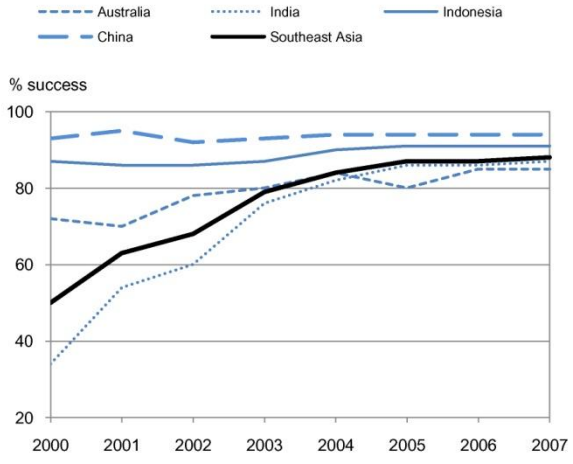
1.10.2. **Numbers of persons with tuberculosis, 2008**



1.10.3. **Tuberculosis prevalence rates, selected countries, 1990-2008**



1.10.4. **Tuberculosis treatment success under DOTS, selected countries, 2000-2007**



Source: WHO TB data, www.who.int/tb/country.

Malaria is endemic in many countries in the Asia/Pacific region. It is particularly associated with specific ecological zones such as forests in tropical and subtropical Southeast Asia, but it is also found in more temperate areas of the region. Among the population living in affected areas, mobile and migrant populations as well as infants, young children and pregnant women are especially vulnerable. Around 85% of those who die from malaria are children.

Malaria especially affects the poor in remote rural areas who cannot afford treatment or have limited access to health care. Malaria causes significant economic losses, more than 1% of GDP in countries with high levels of transmission. In some heavy-burden countries, the disease accounts for up to 40% of public health expenditures, and a significant proportion of hospital admissions and outpatient health clinic visits.

Around three-quarters of the total population in Asia/Pacific countries are at risk of malaria. In 2008, malaria was confirmed (through microscopy or rapid diagnostic tests) in 2.6 million cases, but probable malaria cases in the region number around 24-29 million annually (WHO, 2010a). Most of the population at moderate-to-high risk live in Bangladesh, Cambodia, India, Indonesia, Myanmar, Papua New Guinea and Thailand, which together contribute 95% of confirmed malaria cases annually (Figure 1.11.1). The vast majority of confirmed cases occur in India (over 1.5 million in 2008), whereas Myanmar registered the highest number of deaths (over 1 000 in 2008) (Figure 1.11.2). In the Pacific region, the Solomon Islands has high recorded rates of malaria, and Papua New Guinea recorded a large number of deaths (628 in 2008).

Although a number of countries in the region such as the Democratic People's Republic of Korea, Sri Lanka and Thailand have shown a significant reduction in recorded incidence in recent years, others, including India and Indonesia, have remained static or have even increased. However, this is due to better detection rather than an increase in the underlying incidence (WHO, 2010a) (Figure 1.11.3).

Some key interventions to control malaria include prompt treatment with artemisinin-based combination therapies, the use of insecticide-treated nets by people at risk and indoor residual spraying with insecticide to control mosquitoes (Figure 1.11.4). Overall mosquito net coverage in the region has increased from 6% in 2005 to 17% in 2008. But malaria control efforts are hampered by increased resistance of mosquitoes to insecticides, and uncontrolled population movement leading to more frequent epidemics. The growing problem of multidrug resistance is also more severe in Asia than in any other part of the world. Successful malaria control depends on long-term, sustained commitments by national governments.

For further reading

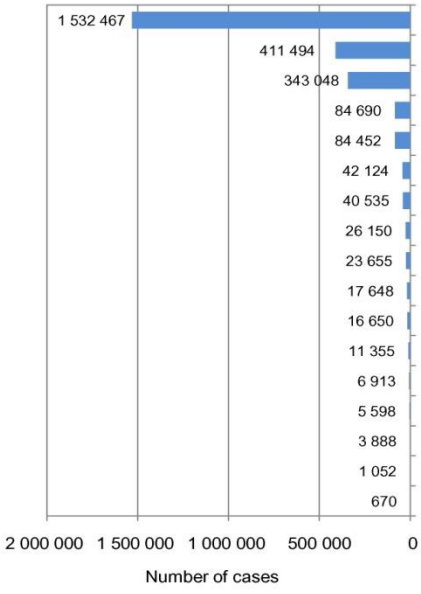
WHO (2009), *World Malaria Report 2009*, World Health Organization, Geneva.

Definition and measurement

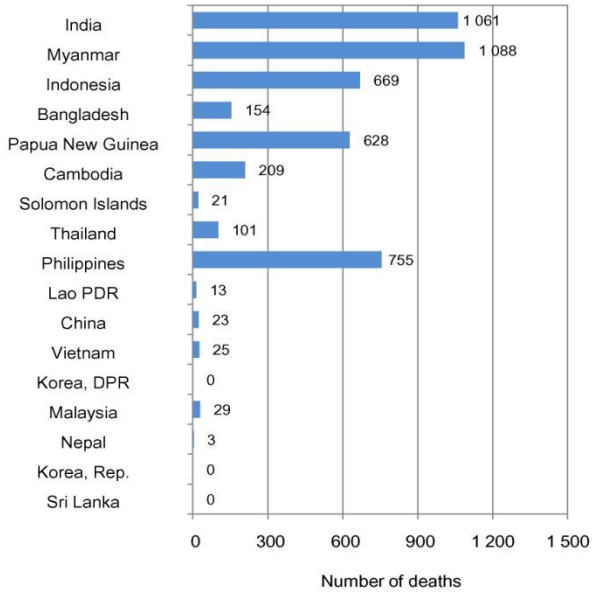
Malaria is a tropical disease caused by a parasite transmitted by the bites of infected female Anopheles mosquitoes. After a period spent in the liver, malaria parasites multiply within red blood cells, causing symptoms such as fever, headache and vomiting. In severe cases, the disease can be fatal. Malaria is preventable and curable, although no vaccine currently exists.

Microscopy or rapid diagnostic tests are recommended to confirm malaria infection in suspected patients. In addition to confirmed cases reported to health authorities, many probable cases occur annually. Underreporting of cases and deaths remain a major challenge in countries with inadequate and limited access to health services and weak surveillance systems (WHO, 2008a).

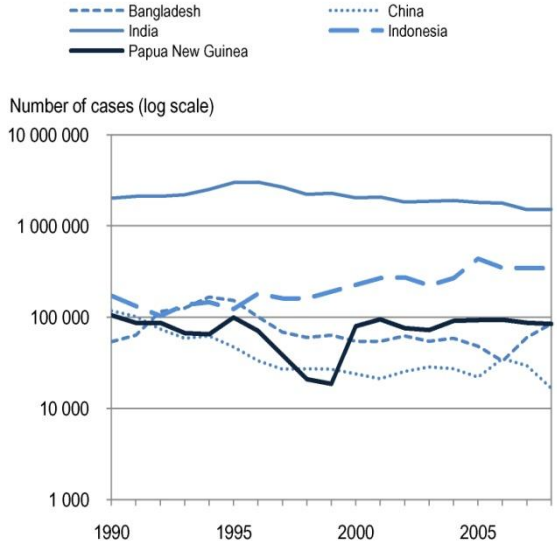
1.11.1. **Confirmed malaria cases, 2008**



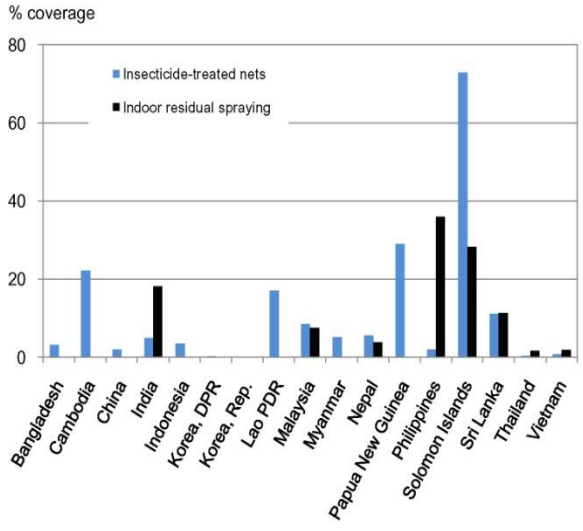
1.11.2. **Confirmed malaria deaths, 2008**



1.11.3. **Confirmed malaria cases, 1990-2008**



1.11.4. **Estimated coverage of insecticide-treated nets and indoor residual spraying, 2008**



Source: WHO, 2009e.

Diabetes is now one of the most common non-communicable diseases globally. It is a chronic metabolic disease, characterised by high levels of glucose in the blood. It occurs either because the pancreas stops producing the hormone insulin (type 1 diabetes), or through a combination of the pancreas having reduced ability to produce insulin alongside the body being resistant to its action (type 2 diabetes). People with diabetes are at a greater risk of developing serious complications, including cardiovascular diseases, renal failure, foot damage and sight loss.

It is estimated that over 140 million people, or 5.9% of the adult population in the Asian region have diabetes (Figure 1.12.1). The highest prevalence occurs among small Pacific island countries including Nauru, with almost one-third (31%) of the total adult population, and in Tonga at 13%. Among the countries included here, Brunei Darussalam, Malaysia, Sri Lanka and Singapore all have prevalence estimates over 10%. Conversely, less than 5% of the adult population in Mongolia, China and Indonesia, and several other countries have diabetes. Average diabetes prevalence across the Asia/Pacific region remains lower than in OECD countries.

Although China's prevalence is comparably moderate, the country still has over 40 million people with diabetes (Figure 1.12.2). India has an even larger number, at over 50 million people. More than five million people have diabetes in each of Pakistan, Japan, Indonesia and Bangladesh. Of the ten countries worldwide with the largest number of people with diabetes, five are in the Asia/Pacific region.

Type 1 diabetes is most often diagnosed in children and young people. It occurs in less than 5% of diabetic cases in the region, except in Australia and New Zealand, where around 10-15% of diabetes is type 1 (Figure 1.12.3). Because of its large population, some 30% of the world's total of 480 000 children with type 1 diabetes come from Asia/Pacific countries, with 114 000 in India alone (IDF, 2009).

Around USD 40 billion is expected to be spent on diabetes care in the region in 2010, with most occurring in India. The amount spent per person varies markedly between countries, from more than USD 3 000 in Australia and Japan, to less than USD 30 in Bangladesh, the Democratic People's Republic of Korea, Myanmar and Pakistan.

As developing countries undergo epidemiological transitions with rapid changes in lifestyle, diet and overweight, diseases such as diabetes are no longer diseases of the wealthy. Countries with often limited resources must cope with a double burden of infectious diseases and an epidemic of diabetes. The high prevalence in Singapore, Hong Kong-China and Macao-China indicate what might occur in China as it rapidly urbanises and expands economically (Cheng, 2010). The urgent need is for governments to translate the evidence on preventive initiatives into affordable and sustainable programmes, as well as investing in diabetes care and management (IDF, 2009).

For further reading

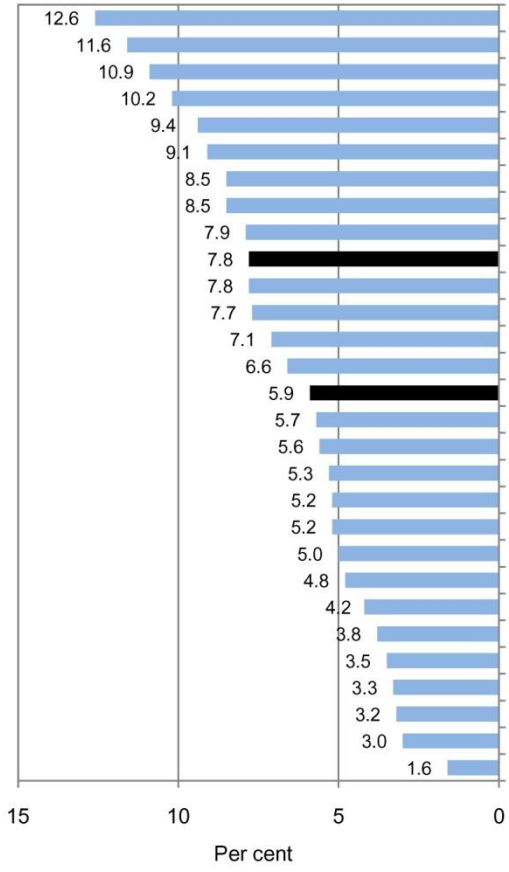
IDF (2009), *IDF Diabetes Atlas, 4th Edition*, International Diabetes Federation, Brussels.

Definition and measurement

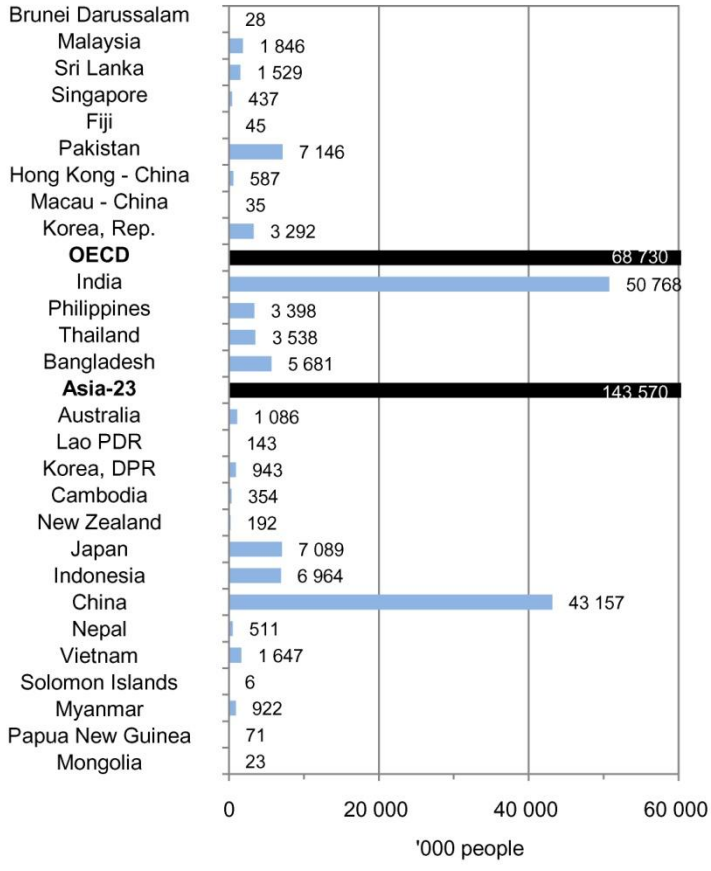
The sources and methods used by the International Diabetes Federation for publishing national prevalence estimates of diabetes are outlined in their Diabetes Atlas, 4th Edition (IDF, 2009). Country data were derived from studies published between 1980 and 2009, and were only included if they met several criteria for reliability. Estimates for several countries (Brunei Darussalam, the Democratic People's Republic of Korea, Lao PDR, Macao-China, Myanmar, Papua New Guinea, Solomon Islands) are derived from neighbouring countries. Data should be interpreted cautiously as general indicators of diabetes frequency.

Prevalence rates were adjusted to the World Standard Population to facilitate cross-national comparisons.

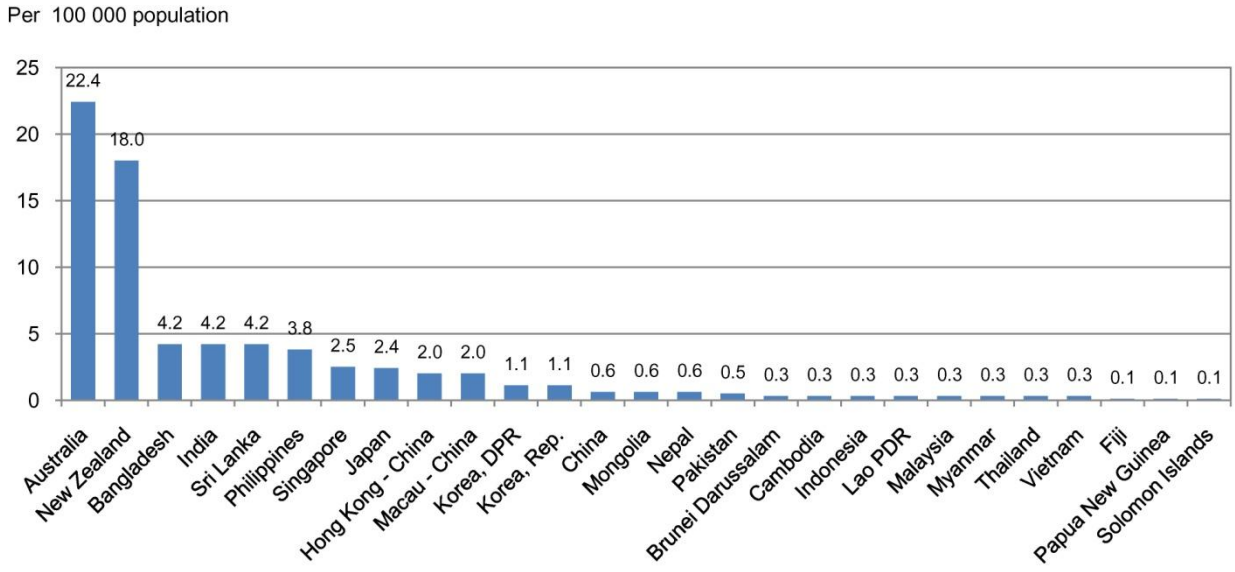
1.12.1. **Prevalence estimates of diabetes, adults aged 20-79 years, 2010**



1.12.2. **Estimated number of adults aged 20-79 years with diabetes, 2010**



1.12.3. **Incidence estimates of Type 1 diabetes, children aged 0-14 years, 2010**



Source: IDF, 2009.

Chapter 2

Determinants of Health

2.1 Reproductive health
2.2 Low birthweight
2.3 Breastfeeding
2.4 Nutrition
2.5 Underweight and overweight
2.6 Water and sanitation
2.7 Tobacco
2.8 Alcohol

Reproductive health can involve having a responsible and safe sexual life, along with the freedom to make decisions about reproduction. This includes accessing methods of fertility regulation and appropriate health care services, so as to provide parents with the best chance of having a healthy baby.

In the Asia/Pacific region, the leading risk factor for death and disability among women of reproductive age is unsafe sex (WHO, 2009d). Women who have access to contraception can protect themselves from unwanted pregnancy, and lower the risk of abortion-related deaths and disability. Spacing births can also have positive benefits on both the reproductive health of the mother and the overall health and well-being of the child.

The quality of reproductive health varies widely across the region. Among 68.4 million births in 2008, maternal mortality estimates ranged from five per 100 000 births in Australia to 376 in Pakistan (see Indicator 1.8 "Maternal mortality"). Infant mortality rates also differed widely (see Indicator 1.2 "Infant mortality").

In China, the Republic of Korea, Thailand and Vietnam, more than three-quarters of all women of reproductive age, or their partners, report using contraceptives (Figure 2.1.1). This proportion was higher than the OECD average. But across all Asian countries, only 60% of couples reported using contraceptives, and this included 8% who use traditional methods such as rhythm, withdrawal and folk methods. In Papua New Guinea, Pakistan and the Lao PDR, less than one-third of couples report using any method of contraception.

Contraceptive use is less prevalent among poorer women in a number of countries including Cambodia, India, Nepal and Pakistan (Figure 2.1.2). In Pakistan, a country reporting low use of contraceptives, prevalence is especially low among women in the lowest wealth quintile. Other countries such as Bangladesh, Indonesia, Mongolia, Thailand and Vietnam, however, indicate relatively equal use of contraceptives by women, regardless of wealth.

The lower that is contraceptive prevalence among countries in the region, the higher is the rate of unmet needs for family planning (Figure 2.1.1). In the Lao PDR, Pakistan, Cambodia and Nepal, one-quarter or more of all women not using contraceptives also reported wanting to delay or cease having any more children. Unmet needs were lowest in China, Thailand and Vietnam, countries where contraceptive use was most prevalent.

Around 26 million unwanted pregnancies were terminated in the Asia/Pacific region in 2003 (Sedgh *et al.*, 2007). Of these, it was estimated that 9.8 million (38%) were unsafe, occurring outside national legal systems. About one-third of all maternal deaths worldwide are due to unsafe abortions (WHO, 2008a). Alarmingly high rates of unsafe abortion occur in Southern and Southeast Asian countries (Figure 2.1.3). Abortion is legally restricted in Bangladesh, Indonesia, the Lao PDR, Malaysia, Myanmar, the Philippines, Sri Lanka, Thailand and most South Pacific island countries.

For further reading

WHO (2008), *Health in Asia and the Pacific*, World Health Organization, Regional Office for Southeast Asia, New Delhi.

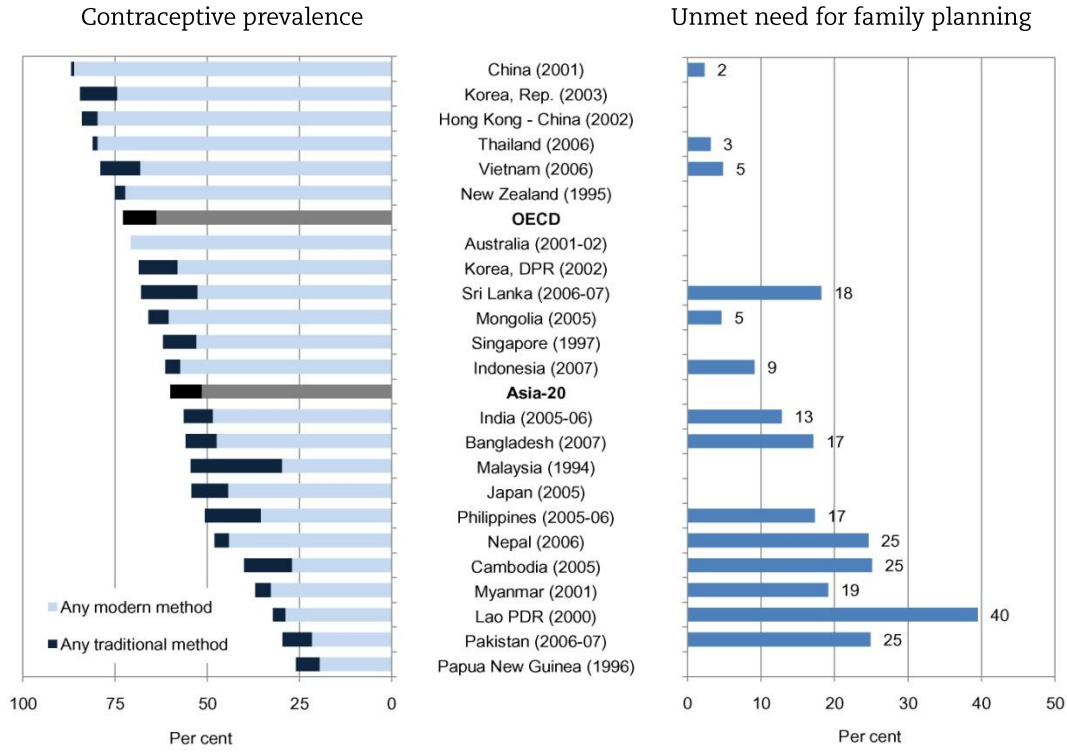
Definition and measurement

Contraceptive prevalence is the percentage of women who are currently using, or whose sexual partner is currently using at least one method of contraception, regardless of the method used. It is usually reported as a percentage of married or in union women aged 15 to 49.

Women with unmet need for family planning are those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the birth of their next child. It is also reported as a percentage of married or in union women aged 15 to 49.

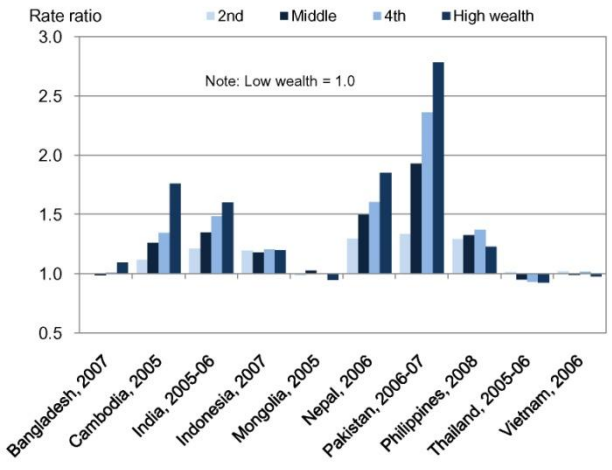
Information on contraceptive use and unmet need for family planning is generally collected through nationally representative household surveys. Estimates of safe and unsafe abortion are derived from administrative and hospital data, as well as from national and household surveys. Survey years and age groups surveyed differ across countries.

2.1.1. **Contraceptive prevalence and unmet need for family planning, latest available estimate**



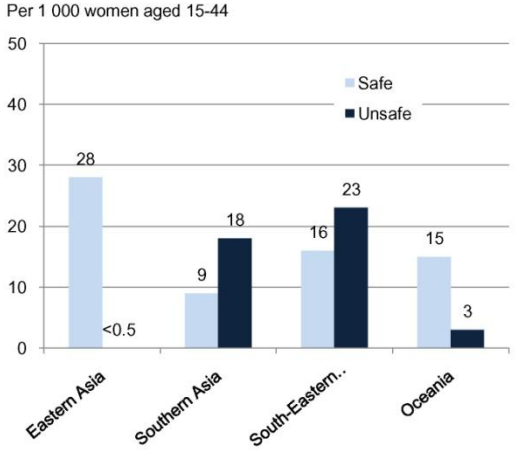
Source: United Nations, 2009b.

2.1.2. **Current contraceptive use among women, by wealth quintile, selected countries and years**



Sources: DHS 2006-2009; MICS 2006-2008.

2.1.3. **Estimated rate of safe and unsafe abortions, by region, 2003**



Source: Sedgh et al., 2007.

Low birthweight is the result of many factors. In countries where mothers face difficult socioeconomic conditions, poor nutrition and health during pregnancy are closely associated with low birthweight. Occurring from either restricted foetal growth or from pre-term birth, low birthweight infants have a greater risk of poor health or death, need a longer time in hospital after birth and are more likely to develop disabilities (UNICEF and WHO, 2004). Some of the mothers' risk factors for low birthweight include poor nutrition or a low body mass index (BMI), low socioeconomic status or minority race, being a young mother, smoking and excessive alcohol consumption, having had in-vitro fertilisation treatment and having a previous history of low weight births.

Among twenty Asian countries, an average of 13% of births (about one in seven) were low birthweight. This is nearly double the OECD average of 7% (Figure 2.2.1). There is a significant regional divide between countries in Eastern Asia (such as China, the Republic of Korea and Mongolia) and Southern Asia (Bangladesh, India, Nepal, Pakistan and Sri Lanka). The incidence of low birthweight ranges from an average of 6% in Eastern Asia to 24% in Southern Asia. A total of 19 million newborns each year in the developing world weigh less than 2 500 grams, and more than half are born in Southern Asia – India alone has more than seven million annually. Southern Asia also has the highest proportion of newborns not weighed at birth, at around 70%.

Trend analysis of low birthweight is difficult because of a lack of comparable estimates both within and between countries. Available surveys indicate that the incidence of low birthweight in the region has remained roughly constant since the 1990s. (UNICEF Childinfo, 2010). Both India and Indonesia show little change (Figures 2.2.2 and 2.2.3). Large reported declines in Vietnam, Papua New Guinea and Bangladesh may result from differences in survey samples and methodology.

China, however, has shown a steady decline, with children greatly benefitting from the country's rapid and sustained economic growth over recent decades. Access to food, and diets in general have improved in many provinces. Low birthweight prevalence had fallen to 3.7% in 2003, well below the OECD average, although China's large population size means that the number of children affected is high, with an estimated one million newborns with low birthweight each year.

Low birthweight in Japan has increased rapidly over the past decades, from around 6% in the mid-1980s to close to 10% in mid-2000s. A number of risk factors have contributed to this increase, including the rising prevalence of smoking among young women together with a significant move towards later motherhood. Despite the increase in low birthweight babies, Japanese medical care for newborns has been particularly successful in reducing infant mortality.

Low birthweight is an important indicator of infant health because of the close relationship between birthweight and later morbidity and mortality. It is an underlying factor in 60-80% of neonatal deaths, with low birthweight babies 20 times more likely to die in infancy. Countries reporting a higher incidence of low birthweight report greater infant mortality (Figure 2.2.4).

For further reading

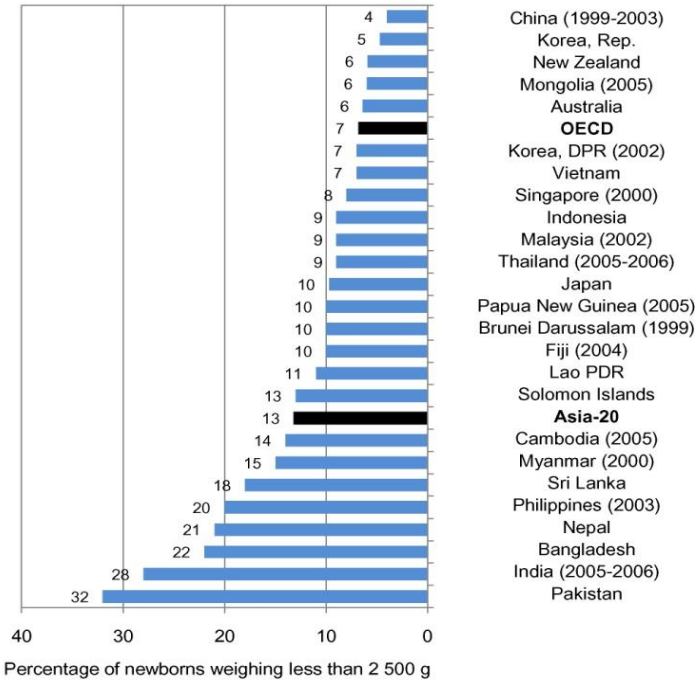
UNICEF and WHO (2004), *Low Birthweight: Country, Regional and Global Estimates*, UNICEF, New York.

Definition and measurement

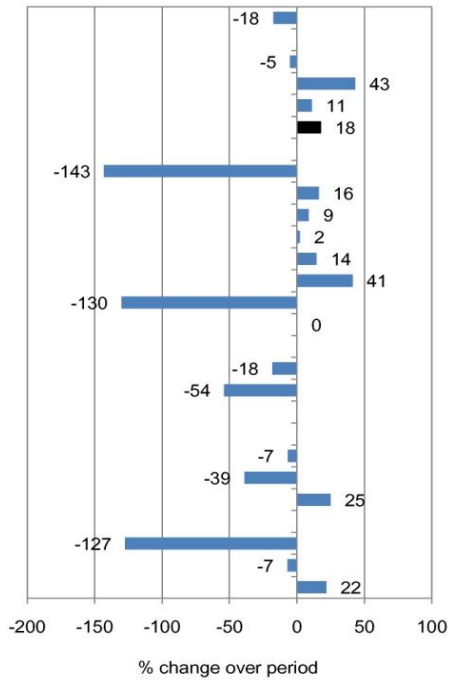
Low birthweight is defined by the World Health Organization as the weight of an infant at birth of less than 2 500 grams (5.5 pounds) irrespective of the gestational age of the infant. This figure is based on epidemiological observations regarding the increased risk of death to the infant and serves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

In developed countries, the main information sources are national birth registers. For developing countries, low birthweight estimates are primarily derived from mothers participating in national household surveys, as well as routine reporting systems (UNICEF and WHO, 2004).

2.2.1. Low birthweight infants, 2006-2007 (or nearest year available)

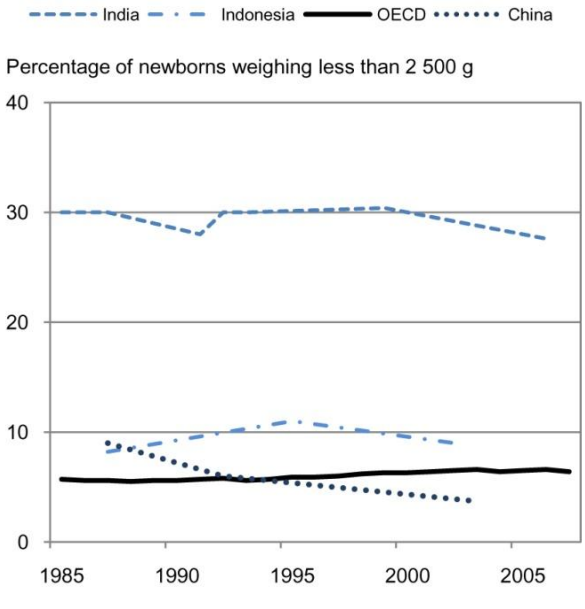


2.2.2. Change in proportion of low birthweight infants, 1986-1987 to 2006-2007

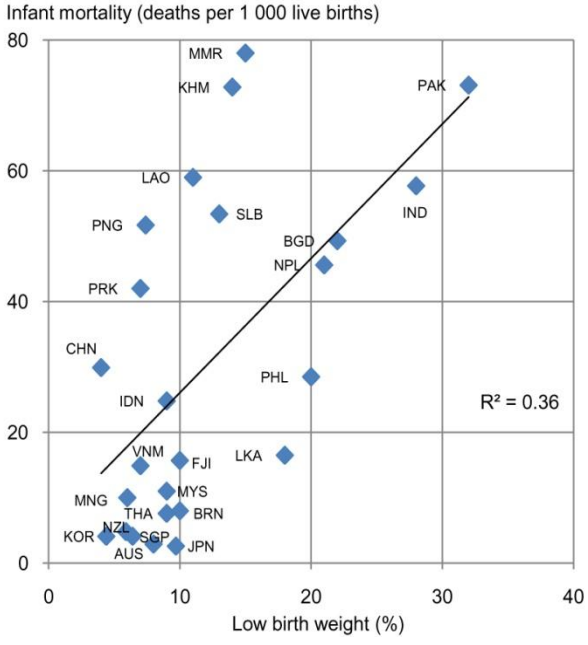


Note: Large declines in Vietnam, Papua New Guinea and Bangladesh may reflect differences in survey methodologies.

2.2.3. Trends in low birthweight infants, selected countries, 1985-2007



2.2.4. Low birthweight and infant mortality, 2006-2007 (or nearest year available)



Source: OECD Health Data 2010; UNICEF Childinfo, World Bank WDI.

Mothers breastfeeding their babies is one of the best ways to ensure child health and survival. Breast milk gives infants the nutrients they need for healthy development, including the antibodies that help protect them from common childhood illnesses such as diarrhoea and pneumonia, the two primary causes of child mortality worldwide. Breastfeeding is also linked with later good health. Adults who were breastfed as babies often have lower blood pressure and lower cholesterol, as well as lower rates of overweight, obesity and type-2 diabetes. Estimates suggest that more than one million child deaths could be avoided each year with improved breastfeeding practices (WHO, 2008b).

Breastfeeding benefits mothers through assisting in fertility control, reducing the risk of breast and ovarian cancer in later life and lowering rates of obesity. The World Health Organization recommends exclusive breastfeeding for the first six months of life, followed by other foods to complement continuing breastfeeding for up to two years or more.

Globally, less than 40% of infants under six months of age are exclusively breastfed (UNICEF, 2009). In the Asia/Pacific region, around half of the countries that are supplying data have exclusive breastfeeding rates greater than 40% (Figure 2.3.1). Three quarters of infants are exclusively breastfed in Sri Lanka and the Solomon Islands, around half in India and Nepal, and around one-third in the Philippines, Indonesia and Malaysia. Exclusive breastfeeding rates are low, at less than 20%, in Thailand, Myanmar and Vietnam.

Exclusive breastfeeding is more common among poorer women in many countries in the region, including Bangladesh, India, Indonesia, Pakistan and the Philippines (Figure 2.3.2). Less than one-fifth of wealthier women in Pakistan and the Philippines exclusively breastfeed for the first three months.

Cambodia is a notable exception. In June 2004, the Government of Cambodia declared that early and exclusive breastfeeding would be the top priority intervention to assist in reducing child mortality. Over the next 18 months, a number of diverse activities and messages contributed to a national breastfeeding movement. Breastfeeding practices were established in hospitals, and community-based volunteers convinced expecting and new mothers to breastfeed their infants. Exclusive breastfeeding rates for babies under six months rose from 7% in 2000 to 60% in 2005, and correspondingly the number of infants receiving both breast milk and plain water fell from 67% to 28% (UNICEF, 2008a).

Feeding practices after the age of six months vary across countries. A majority of mothers introduce complementary foods from 6-9 months, but are also still breastfeeding their infants at 12-15 months of age (Figure 2.3.3). Breastfeeding rates at this age remain high, at above 90%, in South Asia (Nepal, Bangladesh and Sri Lanka), as well as in Cambodia.

For further reading

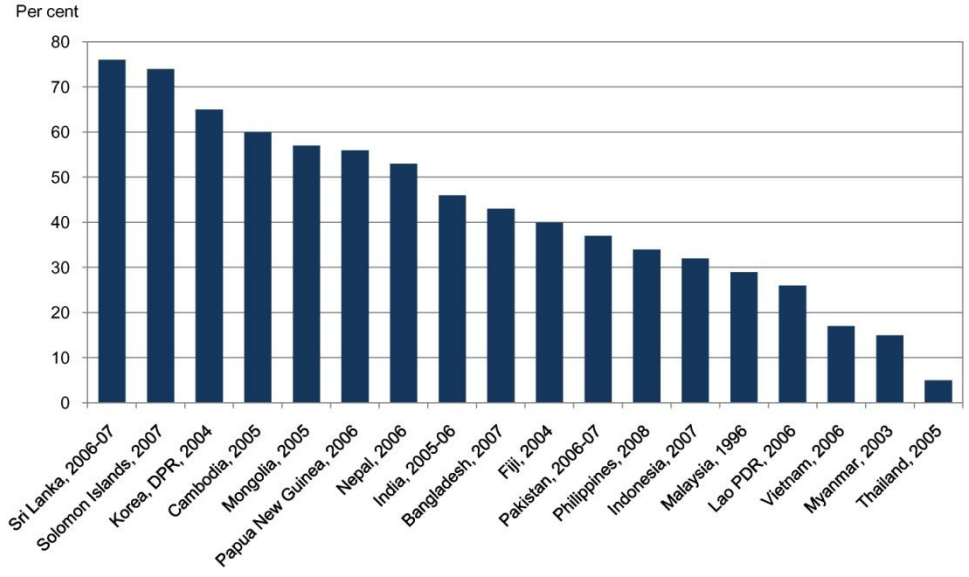
UNICEF (2009), *The State of the World's Children, Special Edition,* UNICEF, New York.

Definition and measurement

Infants who are exclusively breastfed consume only human milk without any supplementation by water, juice, formulas, non-human milk or other foods. Vitamins, minerals, and medications are allowed.

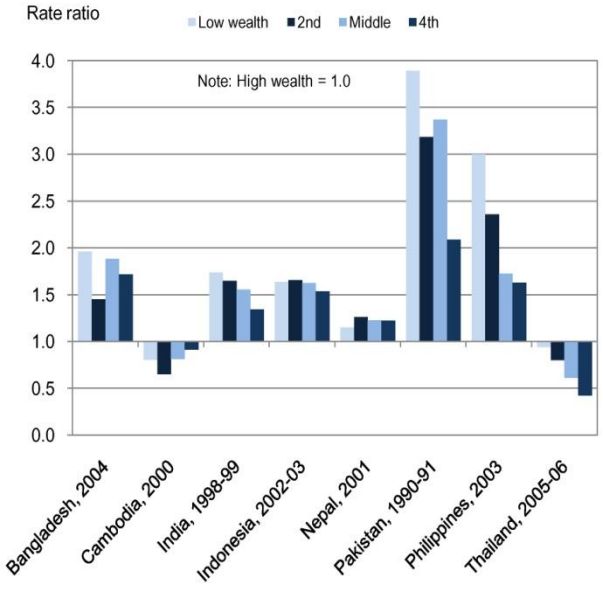
The usual sources of information on the percentage of infants who are exclusively breastfed are household surveys.

2.3.1. **Infants exclusively breastfed for the first six months of life, 2007 or nearest year available**



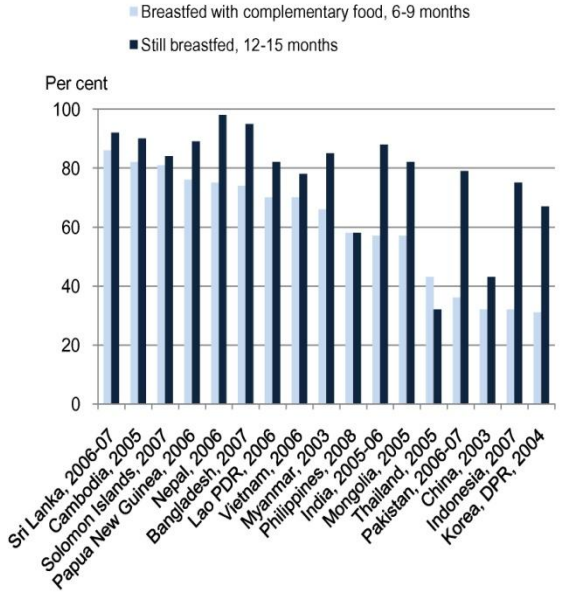
Source: UNICEF, 2009.

2.3.2. **Exclusive breastfeeding of infants 0-3 months, by wealth quintile, selected countries and years**



Sources: Gwatkin et al., 2007; MICS 2006-2008.

2.3.3. **Feeding after age 6 months, selected countries and years**



Source: UNICEF, 2009.

National development is largely dependent on healthy and well-nourished people. Food security means being able at all times to access sufficient, safe and nutritious food which meets food preferences and dietary needs for an active and healthy life. Yet this basic need is not met for many people in the Asia/Pacific region. Chronic hunger has devastating effects on health and well-being, both now and among future generations.

More than half a billion people in the Asia/Pacific region (566.2 million, or 16% of the population) were undernourished in 2004-06 (FAO, 2009). The prevalence of undernourishment exceeded 25% in Cambodia, Bangladesh, Mongolia and the Democratic People's Republic of Korea, and was greater than 10% in two-thirds of the countries examined here (Figure 2.4.2). In China and India alone, almost 380 million people were undernourished in 2004-06.

Daily dietary energy consumption among 19 Asian countries is around 2 500 kcal per person, compared to an average of 3 400 in OECD countries (Figure 2.4.1). Australia, New Zealand, the Republic of Korea and Fiji have high-energy diets. Food available for consumption provides less energy for persons living in the Democratic People's Republic of Korea, Lao PDR, Cambodia and Bangladesh. Compared to diets in OECD countries, food in Asian countries provides two-third the amount of protein, and less than half the amount of fat (Figure 2.4.4).

Food available for consumption has risen across the region as a whole over the past two decades, from around 2 300 kcal in 1990 to the current value of 2 500 (Figure 2.4.3). China's sustained economic expansion has led to many gains for its population, including in food intake, which rose to almost 3 000 kcal in 2007. Bangladesh has achieved substantial increases in rice production; however its self-sufficiency continues to be threatened by population growth, traditional farming practices, limited available land and frequent natural disasters (WHO, 2008a). More recent declines in exports, remittances and income, coupled with the global food crisis and a devastating cyclone led to large increases in the domestic price of rice throughout 2008. The situation in the Democratic People's Republic of Korea is even more precarious. Sustained famine ravaged the population in the 1990s, and the economic crisis threatens to extend its reliance on food aid.

Consecutive food, fuel and economic crises may lead the poor in the Asia/Pacific region to further reduce their dietary intake, as well as their spending on essential items such as education and health care. Investments in the agriculture sector, and social protection for people without access to food will assist in providing an economic, employment and health buffer, especially for poorer countries in the region (FAO, 2009).

For further reading

FAO (2009), *The State of Food Insecurity in the World: Economic Crises – Impacts and Lessons Learned*, Food and Agriculture Organization of the United Nations, Rome.

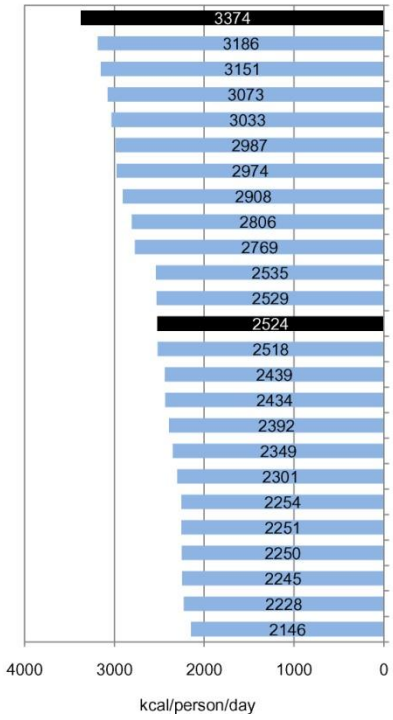
Definition and measurement

FAO (Food and Agriculture Organization of the United Nations) consumption estimates are based on annual estimates of the production and trade of food commodities as supplied by national Ministries of Agriculture and Trade.

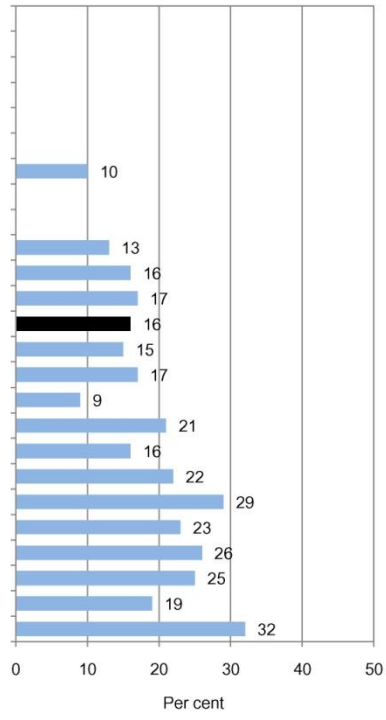
Dietary consumption of energy measures the amount of food available for human consumption, and is expressed in kilocalories (kcal). Measures of protein and fat are expressed in grams. The content of each is derived by applying appropriate food composition factors to commodities.

Undernourishment refers to the condition of people whose intake of calories is continuously below a minimum dietary energy requirement needed for light activity and acceptable weight-for-attained height.

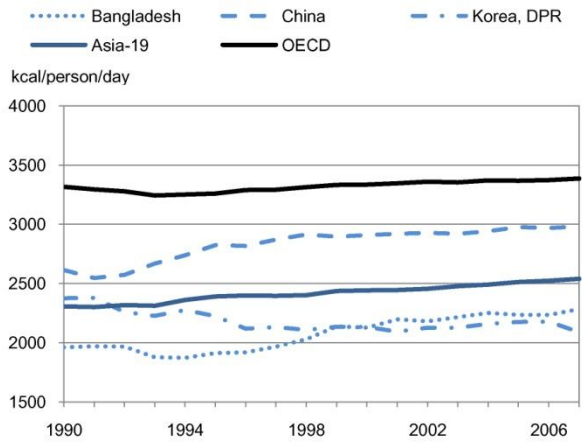
2.4.1. **Dietary energy consumption, 2005-2007**



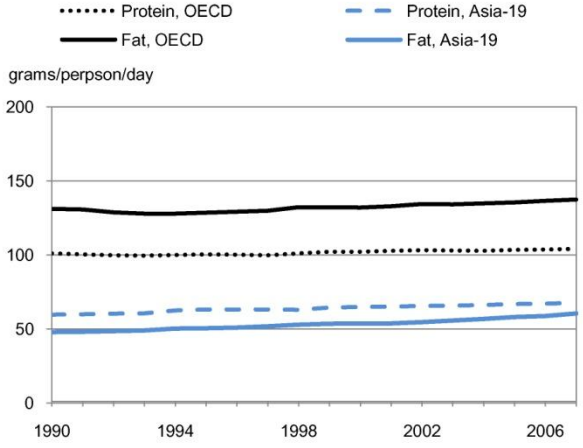
2.4.2. **Prevalence of undernourishment in total population, 2004-2006**



2.4.3. **Dietary energy consumption, selected countries, 1990-2007**



2.4.4. **Dietary protein and fat consumption, OECD and Asian countries, 1990-2007**



Source: FAOSTAT Database, faostat.fao.org.

Poor nutrition, leading to either underweight or overweight, is closely associated with ill health. More than one-third of all deaths worldwide are due to ten main risk factors, and seven of these are related to nutrition (WHO, 2002).

Among developing countries, underweight is the risk factor most closely associated with early death. Undernutrition in pregnant women often leads to low birthweight babies (see Indicator 2.2 "Low birthweight"). More than half of all deaths of children aged under five are attributed to being underweight (WHO, 2008a). Social determinants of health such as poverty, inadequate water and sanitation, and inequitable access to education and health services underlie malnutrition.

A significant proportion of adults in Southern Asia are underweight (Figure 2.5.1). In India, Pakistan and Bangladesh, more than one-quarter of adults have a body mass index less than 18.5. Across 14 Asian countries, 18% of females and 14% of males were underweight in 2007, compared to an average of 4% and 1% in OECD countries. In Mongolia, Fiji, the Republic of Korea and China, less than 10% of male and female populations are underweight. However, it should be noted that some Asian populations may have different associations between BMI, percentage of body fat and health risks than other populations (WHO Expert Consultation, 2004).

Around half of all underweight children worldwide are in Southern Asia. Latest estimates show that the prevalence of moderate or severe underweight ranges from 3% (Singapore) to 45% or more (Nepal, Bangladesh and India) (Figure 2.5.4). A majority of countries in the region have problems with wasting (low weight-for-height) and stunting (failure to grow to normal height) among children. Severe underweight in the region is decreasing, although progress is uneven. China has shown rapid progress in reducing child undernutrition and mortality.

As countries experience economic growth, they undergo demographic and epidemiological transition. The prevalence of overweight and obesity tends to increase, accompanied by rises in non-communicable diseases such as cardiovascular disease, diabetes and cancer. In the Asia/Pacific region, non-communicable diseases already cause more than 60% of all mortality (WHO, 2008a). The populations of a number of countries currently undergoing health transition–such as Thailand, the Philippines, Singapore and Malaysia–exhibit sizeable rates of both underweight and overweight (Figure 2.5.3). These countries face a double burden of under- and overnutrition occurring simultaneously among different population groups (FAO, 2006).

Mirroring underweight, New Zealand, Australia, Fiji and Malaysia have comparatively high rates of overweight (Figure 2.5.2). Around 50% of the adult population in OECD countries has a BMI greater than 25, which is in stark contrast to the average in Asian countries (around 20%). In developing countries obesity, which presents greater health risks, is more common among people with a higher socioeconomic status, those living in urban regions and among middle-aged women. In developed countries however, obesity is increasing among all age groups, and is associated with lower socioeconomic status, especially among women (Sassi, 2010).

For further reading

WHO (2008), *Health in Asia and the Pacific,* World Health Organization, Regional Office for Southeast Asia, New Delhi.

Definition and measurement

The most frequently used measure of underweight, overweight and obesity is the Body Mass Index (BMI). This is a single number that evaluates an individual's weight in relation to height, and is defined as weight in kilograms divided by the square of height in metres (kg/m^2).

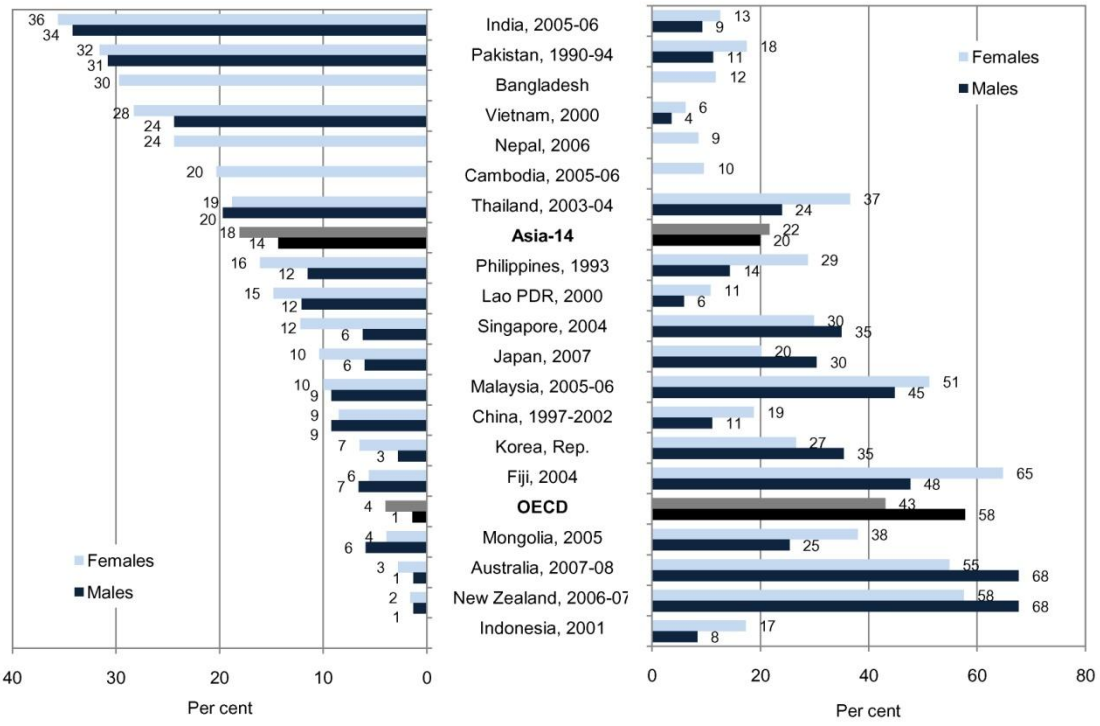
Based on the WHO classification, adults with a BMI below 18.5 are considered to be underweight, and 25 or over are overweight. Adults whose BMI is 30 or over are defined as obese. This classification, however, may not be suitable for all Asian populations, some of whom may have equivalent levels of health risk at lower or higher BMI (WHO Expert Consultation, 2004).

For children, moderate and severe underweight includes the proportion of under-fives falling below minus two standard deviations from the median weight-for-age of the WHO reference population.

In many countries, self-reported estimates of height and weight are collected through population-based health surveys. In a smaller number of countries, including Australia, Japan, the Republic of Korea and New Zealand, health examinations measure actual height and weight. These differences limit data comparability. BMI estimates from health examinations are more reliable, and generally result in higher values than from self-report surveys.

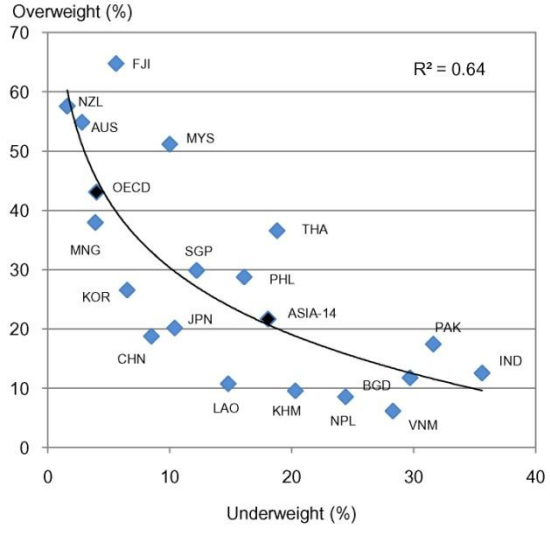
2.5.1. **Adults who are underweight (BMI<18.5), latest year available**

2.5.2. **Adults who are overweight (BMI>=25), latest year available**



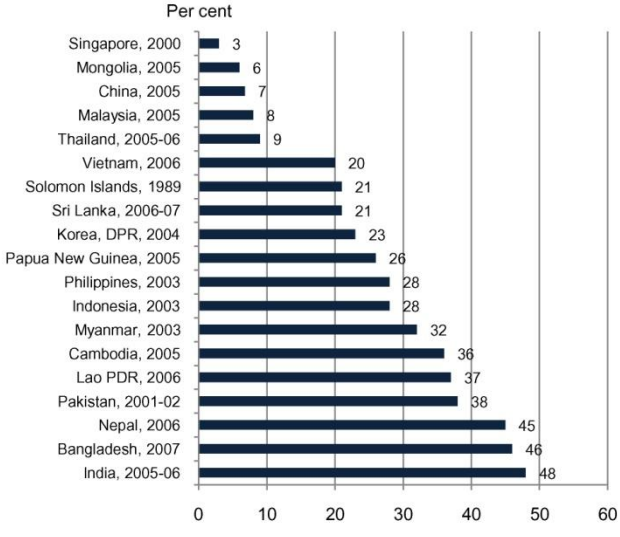
Source: WHO Global Database on Body Mass Index, OECD Health Data 2010.

2.5.3. **Proportion of female population who are underweight or overweight, latest year available**



Source: WHO Global Database on Body Mass Index, OECD Health Data 2010.

2.5.4. **Children under 5 years who are moderately or severely underweight, latest year available**



Source: UNICEF Childinfo.

Safe water and adequate sanitation are vital to human health and well-being. Their want has serious repercussions for individual health, livelihood and quality of life. Diarrhoeal diseases alone kill almost two million people annually, mostly children under the age of five. Better access to water and sanitation leads to great social and economic benefits, whether through higher educational participation, improved living standards, lower health care costs or a more productive labour force.

The use of improved sources of drinking-water is high in the Asia/Pacific region, at 86% of the population (Figure 2.6.1). Between 1990 and 2008, 1.1 billion additional people in the region–mostly in India and China–gained access to improved sources, often through piped connections to their homes. Despite this, around 460 million people in the region still do not have access to this basic necessity. Growth in access has been slow in some developing countries in the Pacific region, with less than 50% of the population in Papua New Guinea and Fiji having improved drinking-water sources. The countries with the lowest level of access such as Papua New Guinea, the Lao PDR, Cambodia and Myanmar, also have high rates of under-five mortality (see Indicator 1.3 "Under-5 mortality").

Nearly two billion people (35%) in Asia/Pacific countries do not use improved sanitation (Figure 2.6.2), equivalent to three in every four persons worldwide. In India, Nepal, the Solomon Islands and Cambodia, less than one-third of the population have facilities for adequate excreta disposal, with open defecation still common. The proportion of the population using improved sanitary facilities has grown rapidly in China (from 41% in 1990 to 55% in 2008) and India (18% to 31%). Even so, the WHO goal to halve the worldwide proportion of people without access by 2015 is unlikely to be met (WHO/UNICEF, 2010).

The vast majority of people without safe water and adequate sanitation live in rural areas. Seven out of ten people without basic sanitation, and more than eight out of ten people without improved drinking-water sources live in rural areas. Safe water access for rural dwellers has improved steadily since 1990, to reach 83% of persons in 2008 (Figure 2.6.3). Improving sanitation in rural areas is more problematic. Across the region, only 40% of rural dwellers have access, and in India, only around 20% (Figure 2.6.4). Most of the gain in improved sanitation since 1990 has occurred in urban areas, although rapid population growth in cities has worked against major progress.

More financial resources are needed in developing countries to achieve water and sanitation policy objectives and to realise the associated economic, social and environmental benefits. Tax-based public subsidies, well-designed water tariffs and strategic use of aid flows to the water sector can assist in ensuring that poor and vulnerable groups have access to sustainable and affordable water and sanitation services (OECD, 2009b).

For further reading

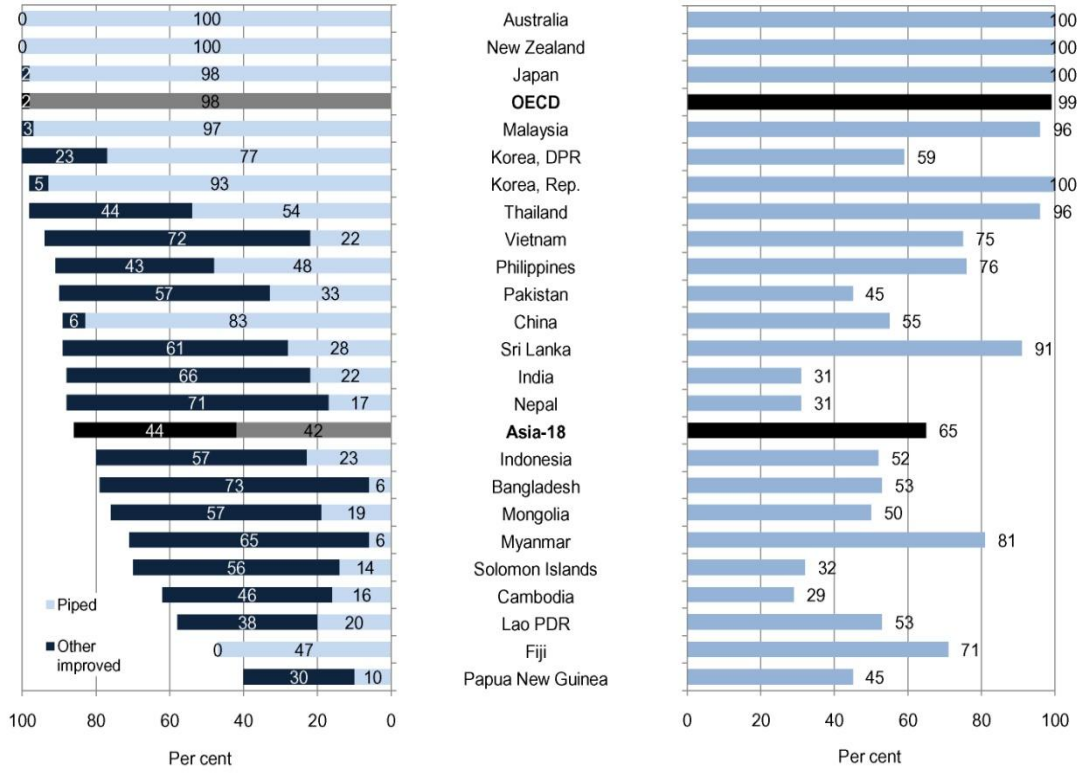
WHO/UNICEF (2010), *Progress on Sanitation and Drinking-Water: 2010 Update*, WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, Geneva.

Definition and measurement

An improved drinking-water source is constructed so that it is protected from outside contact, especially with faecal matter. Sources include piped water, public taps, boreholes, and protected dug wells or springs. Improved sanitation facilities hygienically separate excreta from human contact, through use of flushing to piped sewer systems, septic tanks or pit latrines, along with improved pit latrines or composting toilets (WHO/UNICEF, 2010).

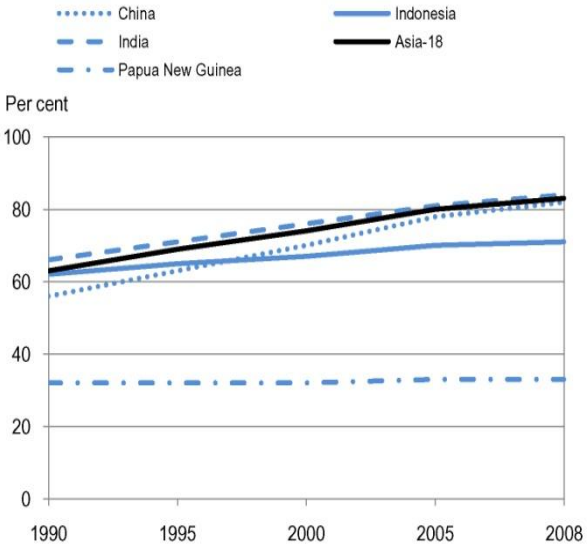
The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) database includes nationally representative household surveys and censuses that ask questions on water and sanitation, mostly conducted in developing countries. Generally, developed countries supply administrative data.

2.6.1. **Access to improved drinking water, 2008**

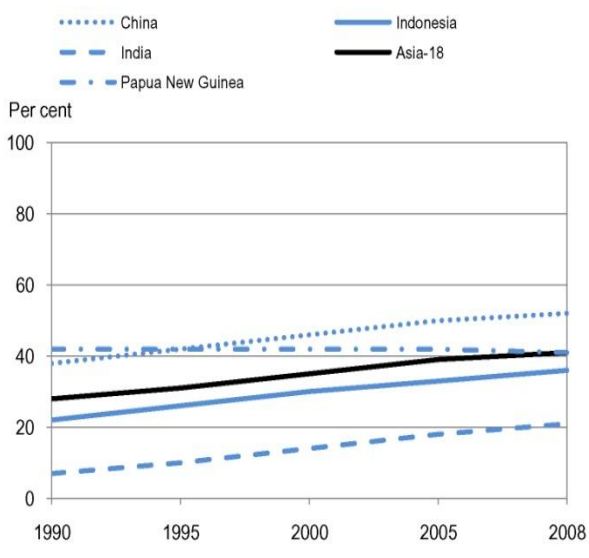


2.6.2. **Access to improved sanitation, 2008**

2.6.3. **Rural population with access to improved water sources, selected countries, 1990-2008**



2.6.4. **Rural population with access to improved sanitation, selected countries, 1990-2008**



Source: WHO/UNICEF 2010.

Tobacco smoking is a common risk factor for a large number of diseases that cause illness and death, including cancer and cardiovascular disease. The global tobacco epidemic is directly responsible for around one-in-ten adult deaths worldwide, or some six million deaths each year, most of which occur in low and middle income countries (Shafey *et al.*, 2009).

In the Asia/Pacific region, approximately 6 000 people die prematurely from tobacco-related diseases every day, summing to 2.3 million deaths per year. The economic and social costs are high, with families deprived of breadwinners, large public health costs for treatment, and lower workforce productivity (WHO, 2008a).

The proportion of daily smokers varies greatly among countries (Figure 2.7.1). In 2006, rates among men were highest in China, the Lao PDR, the Democratic People's Republic of Korea and Indonesia, at over 50%. The smoking rate among Chinese men aged 30-60 is 70%. In Fiji and Australia, however, less than 20% of adult males smoked daily. The regional average for men, at 40%, was significantly higher than the 30% of males who smoked daily in OECD countries.

There are large male-female disparities in the Asia/Pacific region, with only 6% of women reporting smoking daily in 2006. Rates were highest in Nepal (25%), where it is a common practice among rural women, as well as in the developed countries of New Zealand (20%) and Australia (15%).

Around one-third of the world's smokers live in China. Within the next 15 years, unless habits change, smoking will kill an estimated two million Chinese annually. Control policies face formidable opposition from large tobacco companies, and low public awareness, especially among the rural population, adds to the challenges faced by China (Cui, 2010; Herd *et al.*, 2010).

In developing countries, there is a lack of public awareness about risks and lax control measures. Among youth aged 13-15 years, 17% of males and 8% of females report that they currently smoke (Figure 2.7.2), which will lead to negative health effects for many decades to come. Tobacco use is also greatest among those who can least afford it (Figure 2.7.3).

In Indonesia, the world's third largest tobacco consumer, smokers spent around 12% of their household income on cigarettes in 2005, which are cheap at around USD 1 per packet, or a few cents for individual sticks. Tobacco taxes are low in Indonesia, but still 6% of government revenue was derived from cigarette taxes in 2007. Increasing tobacco tax rates is an effective way to prevent deaths, through discouraging youth from beginning cigarette smoking and encouraging current smokers to quit. Higher taxes also generate additional government revenue (Barber *et al.*, 2008).

For further reading

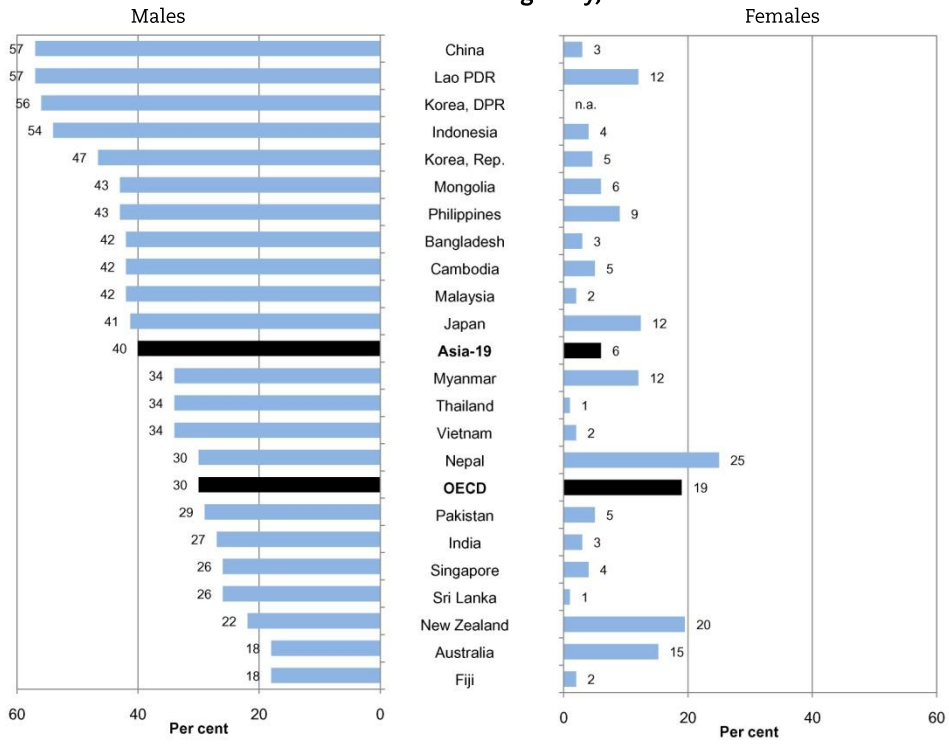
WHO (2009), *WHO Report on the Global Tobacco Epidemic, 2009: Implementing Smoke-Free Environments*, World Health Organization, Geneva.

Definition and measurement

Adults smoking daily is defined as the percentage of the population aged 15 years and over who reported smoking every day. International comparability is limited, since data were obtained from a broad range of surveys with different survey instruments conducted in different years. Results were age standardised to the WHO Standard Population.

Current tobacco use among youth is derived from the Global Youth Tobacco Survey which was implemented between 1999 and 2008. It is defined as the percentage of young people aged 13-15 years who consumed any tobacco product at least once during the last 30 days prior to the survey.

2.7.1. **Adults smoking daily, 2006**

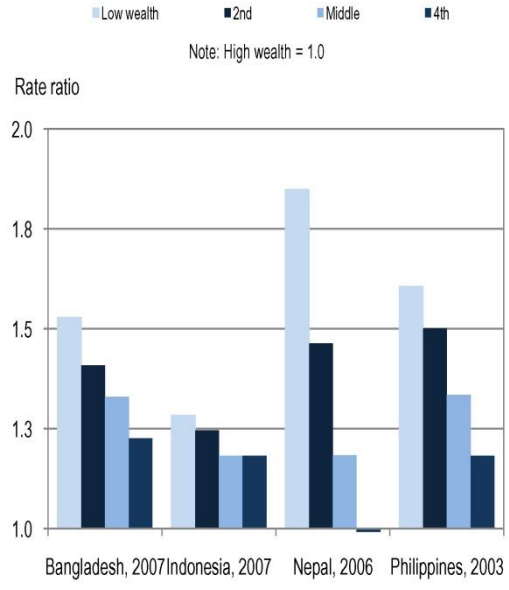


2.7.2. **Current tobacco use among youth aged 13-15 years, 2007 (or nearest year available)**



Sources: WHO, 2009b; *OECD Health Data 2010*.

2.7.3. **Cigarette smoking among men, by wealth quintile, selected countries and years**



Sources: DHS 2006-2009; Gawtkin et al., 2007.

The health burden related to alcohol consumption, both in terms of morbidity and mortality, is considerable in most parts of the world (WHO, 2004). High alcohol intake increases the risk for chronic disease and injury. Drunkenness and alcohol dependence also have harmful social consequences.

In the Southeast Asian region, 2.3% of all deaths in 2004 were attributed to alcohol consumption, and in the Western Pacific region, over 5%. The direct and indirect economic costs of alcohol (which include lost productivity, health-care costs, and road accident- and crime-related costs) are substantial – in Thailand and the Republic of Korea these costs are about 2% of GDP (Rehm *et al.*, 2004; Thavorncharoensap *et al.*, 2010).

Alcohol consumption across Asia/Pacific populations is highest among more developed countries (Figure 2.8.1). Adults aged 15 years and over in Australia, New Zealand, Japan and the Republic of Korea consumed over eight litres of alcohol per capita in 2005. In Thailand, the Lao PDR, China and the Philippines, consumption was between four and eight litres, with all other Asia/Pacific countries listed here consuming less than four. Because religious traditions in a number of countries prohibit drinking alcohol, consumption figures in these are minimal (Figure 2.8.4). In other countries, only certain people groups consume alcohol; in Thailand, for example, around one-third of the population drink. The average consumption across 20 Asia/Pacific countries in 2005 was a modest 2.5 litres per capita, compared to 9.5 in OECD countries.

Average consumption across the whole region exhibited little change between 1980 and 2005 (Figures 2.8.2 and 2.8.3), although variations exist among countries. Among countries with significant intake, alcohol consumption declined in the Republic of Korea, Australia and New Zealand. Consumption increased in China, the Lao PDR, the Philippines, Japan and Thailand. For China, alcohol consumption increased from 1.7 litres per capita in 1980 to 4.4 in 2005, in conjunction with rapid economic development.

Changing patterns of drinking lead to more potential for harm through binging and heavy drinking occasions, especially among young people (Figure 2.8.4). In Japan, almost 40% of male drinkers surveyed in 2001 reported regular heavy drinking. In Australia, around 10% of the adult population in 2007 consumed alcohol at levels considered risky for health in the long-term (AIHW, 2008). A number of countries, including Australia, New Zealand, the Republic of Korea and Thailand are defining and implementing policies to protect against alcohol's harmful effects (WHO, 2008a).

The World Health Organization has endorsed a global strategy to combat the harmful use of alcohol, through direct measures such as medical services for alcohol-related health problems, and indirect ones, such as the dissemination of information on alcohol-related harm.

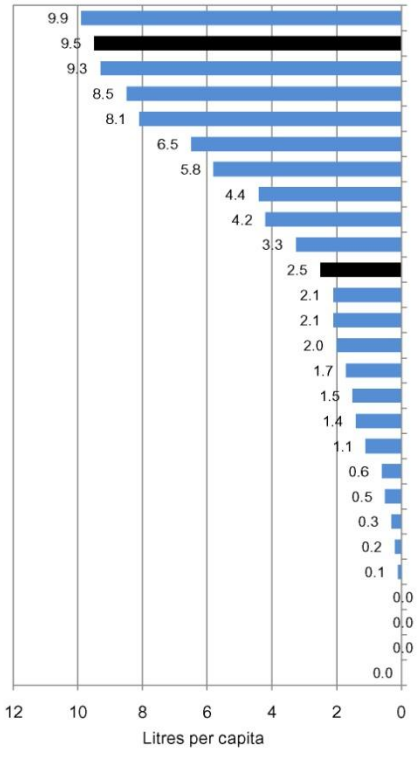
For further reading

WHO (2004), *Global Status Report on Alcohol 2004*, WHO, Geneva.

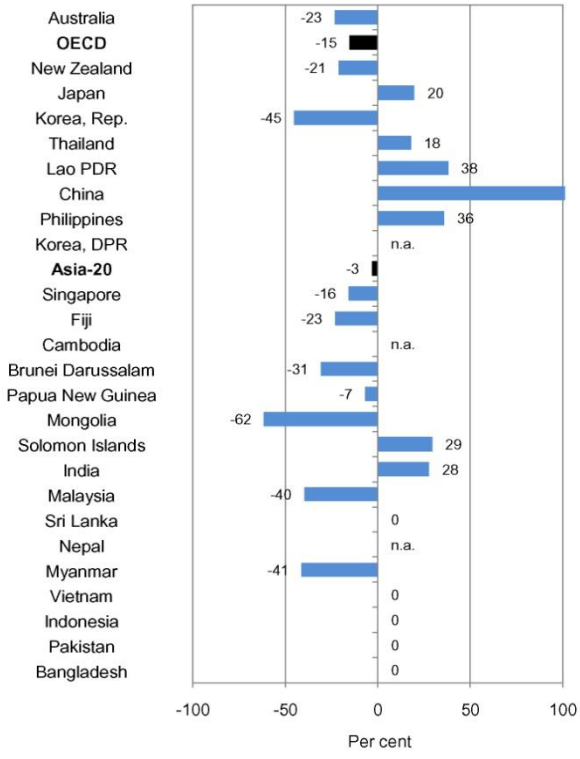
Definition and measurement

Alcohol intake is measured in terms of annual consumption of litres of pure alcohol per person aged 15 years and over. Sources are based mostly on FAO (Food and Agriculture Organization of the United Nations) data, which consist of annual estimates of beverage production and trade supplied by national Ministries of Agriculture and Trade. The methodology to convert alcoholic drinks to pure alcohol may differ across countries. Data are for recorded alcohol, and exclude homemade sources, cross-border shopping and other unrecorded sources. Information on drinking patterns are derived from surveys and academic studies (WHO, 2004).

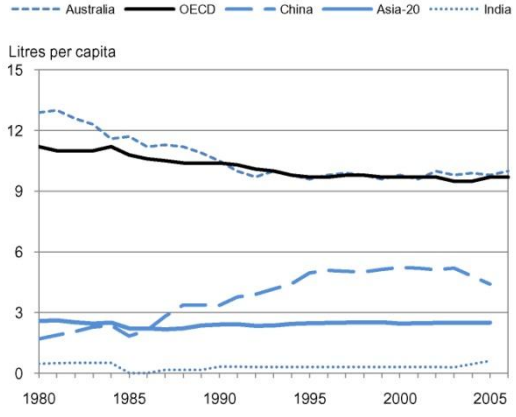
2.8.1. **Alcohol consumption, population aged 15 years and over, 2005**



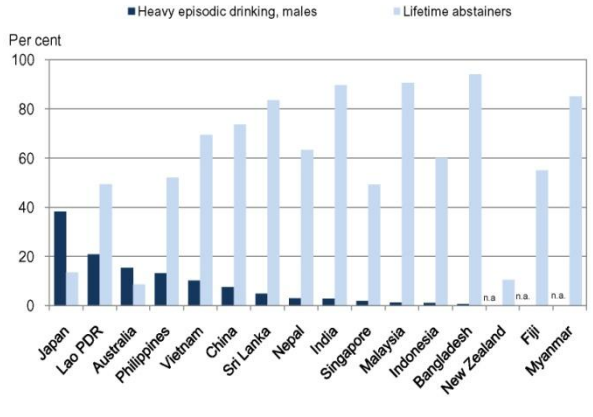
2.8.2. **Change in alcohol consumption per capita, population aged 15 years and over, 1980-2005**



2.8.3. **Trends in alcohol consumption, selected countries, 1980-2006**



2.8.4. **Patterns of consumption, 2003 (or nearest available year)**



Sources: WHO, 2010a; WHO Global Information System on Alcohol and Health (GISAH); *OECD Health Data 2010*.

Chapter 3

Health Care Resources and Utilisation

3.1 Doctors and nurses
3.2 Consultations with doctors
3.3 Hospital beds and average length of stay
3.4 Hospital discharges
3.5 Pregnancy and birth
3.6 Childhood vaccination

Access to high-quality services depends crucially on the size, skill mix, geographic distribution and productivity of the health workforce. Health workers, and in particular doctors and nurses, are the cornerstone of health systems.

The number of doctors per capita varies widely across Asia/Pacific countries. The Democratic People's Republic of Korea has the highest number of doctors per capita, with 3.3 doctors per 1 000 population in 2003. This is an even higher number than the average among OECD countries (3.2 in 2008) (Figure 3.1.1). In the Democratic People's Republic of Korea, the government has supported the training of health workers over the years, giving priority to training even in difficult conditions. There are about 100 training institutions for health personnel, including central and provincial medical universities, as well as nursing and midwifery schools (WHO, 2007b).

Australia and New Zealand also have a high number of doctors compared with other Asia/Pacific countries. Despite its relatively low health spending per capita, Mongolia also has a high number of physicians per capita, much higher than the average among Asian countries. Since 2000, the overall number of doctors has increased a lot in specialist hospitals and private hospitals in Mongolia, and there is evidence of oversupply of doctors, in particular of medical specialists. Despite this large supply of doctors in Mongolia, there is a shortage of experienced doctors in rural areas (Asian Development Bank, 2008).

In contrast, Papua New Guinea, Indonesia and the Solomon Islands have the lowest number of physicians per capita. The low supply of doctors in Indonesia is associated with a low level of health expenditure (see Figure 4.1.1 in the next chapter).

In China, the number of doctors has risen by about 2% annually over the past few years (OECD, 2010), and the number of doctors now exceeds the average across Asian countries, although it remains less than half the average in OECD countries.

Nurses outnumber physicians in most Asia/Pacific countries, but with a few exceptions. The number of qualified nurses is the highest in high-income countries such as Australia, New Zealand and Japan, with all of these countries having more than nine nurses per 1 000 population. The supply is much lower in a number of low-income countries, including Bangladesh, Myanmar, Nepal, Pakistan and Papua New Guinea, where there is much less than one nurse per 1 000 population. The number of nurses per capita is also relatively low in India and China, less than half the average across Asian countries of 2.4 nurses per 1 000 population (Figure 3.1.2).

In many Asia/Pacific countries, there are between two and five nurses per doctor, which is also the case in many other OECD countries (Figure 3.1.3). While there are more than ten nurses per doctor in the Solomon Islands and New Guinea, this reflects the fact that there are very few doctors in these two countries. On the other hand, there is less than one nurse per doctor in Bangladesh, Myanmar and China. The fact that there are more doctors than nurses in these countries raises questions about efficiency in the allocation of resources and tasks in health care delivery.

For further reading

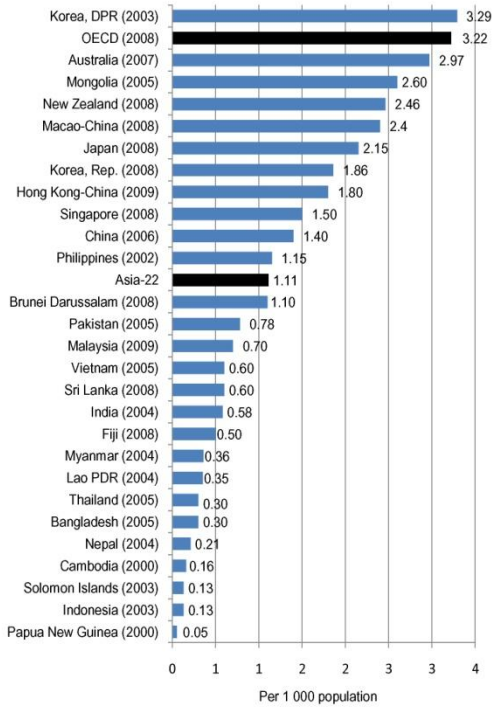
WHO (2008), *Health in Asia and the Pacific*, World Health Organization, Regional Office for Southeast Asia, New Delhi.

Definition and measurement

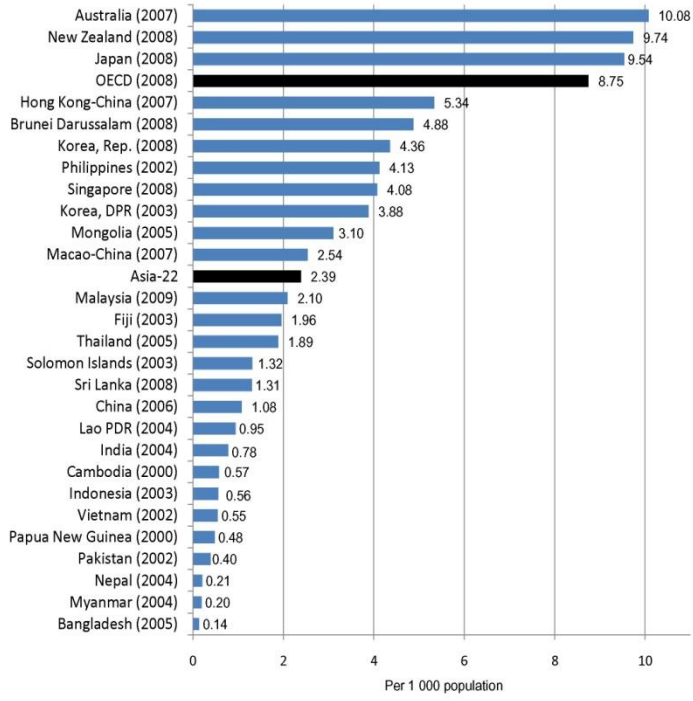
Doctors include physicians qualified in either allopathic medicine or other forms of medicine such as Chinese traditional medicine, ayurveda or homeopathy.

Nurses are defined as persons who have completed a programme of basic nursing education and are qualified to provide nursing care. Although midwives should normally be excluded from nurses, some Asia/Pacific countries report midwives together with nurses.

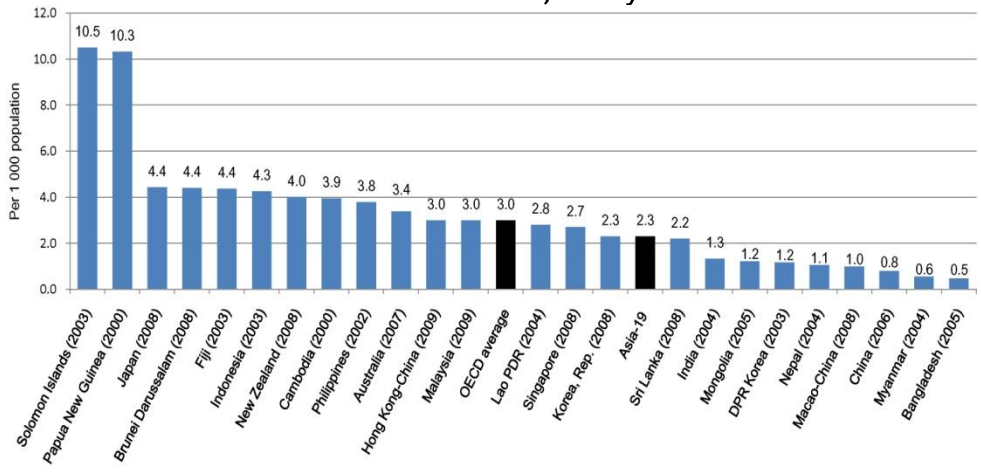
3.1.1. **Doctors per 1,000 population, latest year available**



3.1.2. **Nurses per 1,000 population, latest year available**



3.1.3. **Ratio of nurses to doctors, latest year available**



Sources: OECD Health Data 2010; WHO Global Atlas of the Health Workforce (2003-2007); National Data Sources (see Annex 1).

Consultations with doctors are an important measure of overall access to health services. In general, consultation rates tend to be highest in the high and middle-income economies in the Asia/Pacific region, and significantly lower in the low-income economies.

The number of doctor consultations per person per year ranges from over ten in Japan, the Republic of Korea and Hong Kong-China, to fewer than two in Papua New Guinea, Solomon Islands and China (Chart 3.2.1). Generally, doctor consultation rates in the developing Asia/Pacific economies are lower than the OECD average.

Cultural factors might play a role in explaining some of the variations. For example, Japan, the Republic of Korea, Hong Kong-China and Singapore have the highest rates, despite quite different health financing and delivery systems. On the other hand, payment of physicians by fee-for-service, which has been suggested as explaining some of the variations across OECD countries, does not appear to be an explanatory factor in the Asia/Pacific region.

Chart 3.2.3 shows a close relationship between doctor consultation rates and life expectancy, with consultation rates highest in the countries with highest life expectancy. This does not necessarily imply causality, since overall living standards may influence both consultation rates and life expectancy. There are examples such as Mongolia where relatively high consultation rates are associated with low life expectancy.

Information on consultations can be used to estimate annual numbers of consultations per doctor in countries. This estimate should not be taken as a measure of doctors' productivity, partly because consultations can vary in length and effectiveness, and partly because it excludes the work doctors do on inpatients, administration and research. It is also subject to the comparability limitations reported below, and in particular variations across countries in the extent to which a routine consultation is seen by a physician. Keeping these reservations in mind, this estimate varies six-fold across Asia/Pacific countries (Chart 3.2.2). The range is comparable to that reported across the OECD countries, although on average there are many more consultations per doctor in the Asian economies covered (about 4 600) than the OECD average (about 2 600).

Whilst there are large variations in consultation rates across countries, there are also substantial variations in consultation rates between the poorest and richest households within each country (Chart 3.2.4). Although the poorest quintiles might be expected to have the greatest need for doctor consultations, the consultation rates are lower than in other households in most countries, and especially so in India and Indonesia. However, in other countries, people in poor households visit doctors more often than the non-poor, particularly in Hong Kong-China and the Republic of Korea, suggesting that access is more based on needs than ability to pay.

For further reading

Refer to Annex A.

Definition and measurement

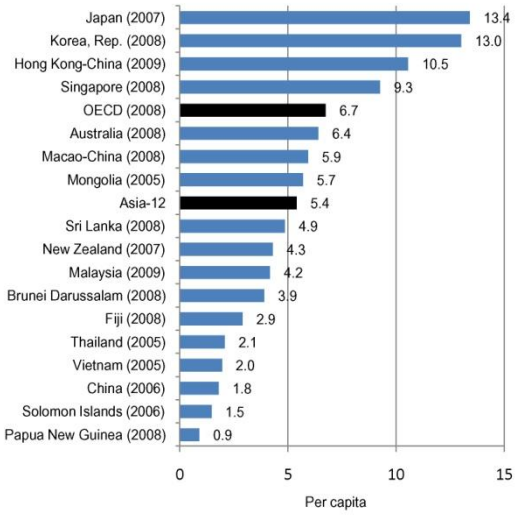
Consultations with doctors are defined as contacts with physicians (both generalists and specialists). These may take place in doctors' offices or clinics, in hospital outpatient departments, and in some cases in the patient's own homes. Doctors include physicians qualified in either allopathic medicine or other forms of medicine such as Chinese traditional medicine, ayurveda or homeopathy.

Two main data sources can be used to estimate consultation rates: administrative data and household health surveys. In general, administrative data sources in the non-OECD economies of the Asia/Pacific region only cover public sector physicians or publicly financed physicians. As physicians in the private sector provide a large share of overall consultations in most of these countries, existing administrative data sources do not cover most physician consultations. The alternative data source is household health surveys, but as in OECD countries, these surveys in the Asia/Pacific region tend to produce lower estimates of consultation rates, owing to incorrect recall and non-response rates.

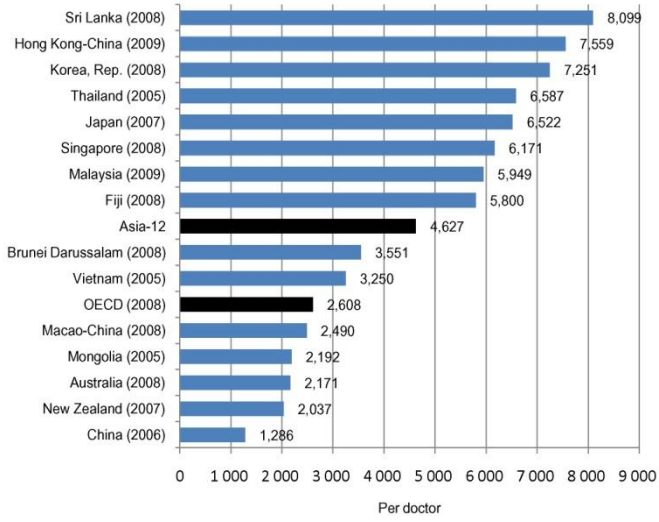
In those countries (such as Hong Kong-China, Singapore, Solomon Islands, Sri Lanka) where administrative data only cover the public sector, household survey data have been used to obtain an estimate of private sector consultation rates, to arrive at an overall estimate of consultations with doctors.

For many countries (such as China, Mongolia, Thailand, Vietnam), there was insufficient information to fully assess the data sources, and the comprehensiveness of coverage of private sector consultations could not be assessed. In these cases, caution must be applied in using and interpreting the data.

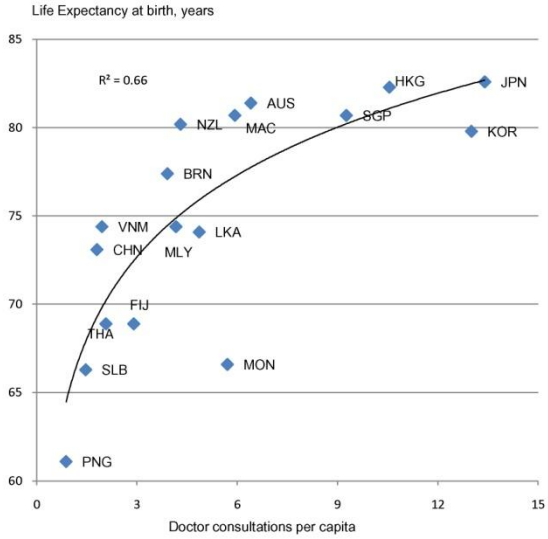
3.2.1. **Doctor consultations per capita, latest year available**



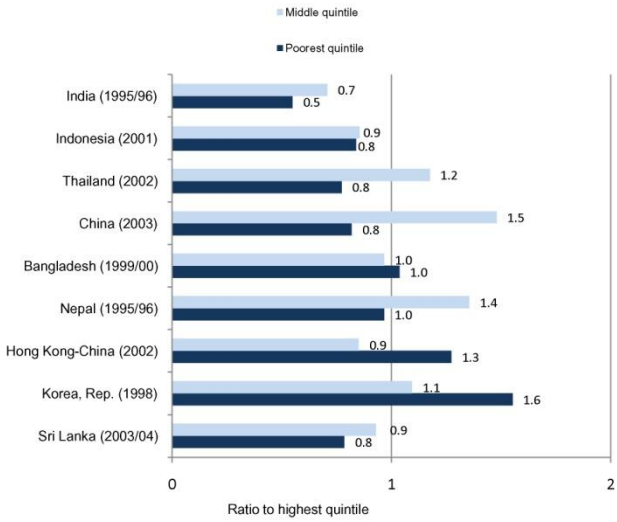
3.2.2. **Number of consultations per doctor, latest year available**



3.2.3. **Doctor consultations per capita and life expectancy at birth, latest year available**



3.2.4. **Ratio of doctor consultation rates in poorest and middle socioeconomic quintiles compared to highest quintile**



Sources: OECD Health Data 2010; National Data Sources (see Annex A).

The number of hospital beds provides a measure of the resources available for delivering care to inpatients in hospitals, and is related to overall access to hospital services. In most health systems, hospitals account for the largest part of overall fixed investment, so the supply of hospital beds is also a reflection of past capital investment.

The number of hospital beds per capita varies considerably across the Asia/Pacific region. It is highest in Japan and the Democratic People's Republic of Korea, with over 13 beds per 1 000 population (Chart 3.3.1). These levels are more than 20 times higher than in countries such as Nepal, Philippines, Indonesia and Myanmar, where the stock of beds does not exceed 0.6 per 1 000 population. These large disparities reflect substantial differences in the resources invested in hospital infrastructure.

Hospitals in most countries account for the largest part of health expenditure. Consequently, the efficiency with which hospitals are used is of major interest. The average length of stay in hospitals (ALOS) is one measure of the efficiency with which hospital resources are used. All other things being equal, a shorter stay will reduce the cost per discharge, and shift care from inpatient to less expensive outpatient and ambulatory settings. However, shorter stays might be more service intensive and more costly per day. Too short a stay may also result in adverse health outcomes.

In the Asia/Pacific region, there is a large variation in ALOS for acute care, although this variation is not as large as that in the overall supply of hospital beds. The longest lengths of stay are in Japan, the Republic of Korea, Mongolia and China, at over nine days on average. These are two to three times longer than those in Sri Lanka, Bangladesh and Thailand (Chart 3.3.2). The shortest length of stay is in Sri Lanka, at 2.8 days. This coupled with the high admission rates in that country (see Indicator 3.4) suggests that inpatient services in Sri Lanka may be partly substituting for outpatient care, with patients being admitted for minor conditions, which in other countries are managed mostly on an outpatient basis.

In Japan and the Republic of Korea, there may be a problem of "social admission", in that some "acute care" beds may be devoted to long-term care, partly explaining the long average length of stay (Hurst, 2007).

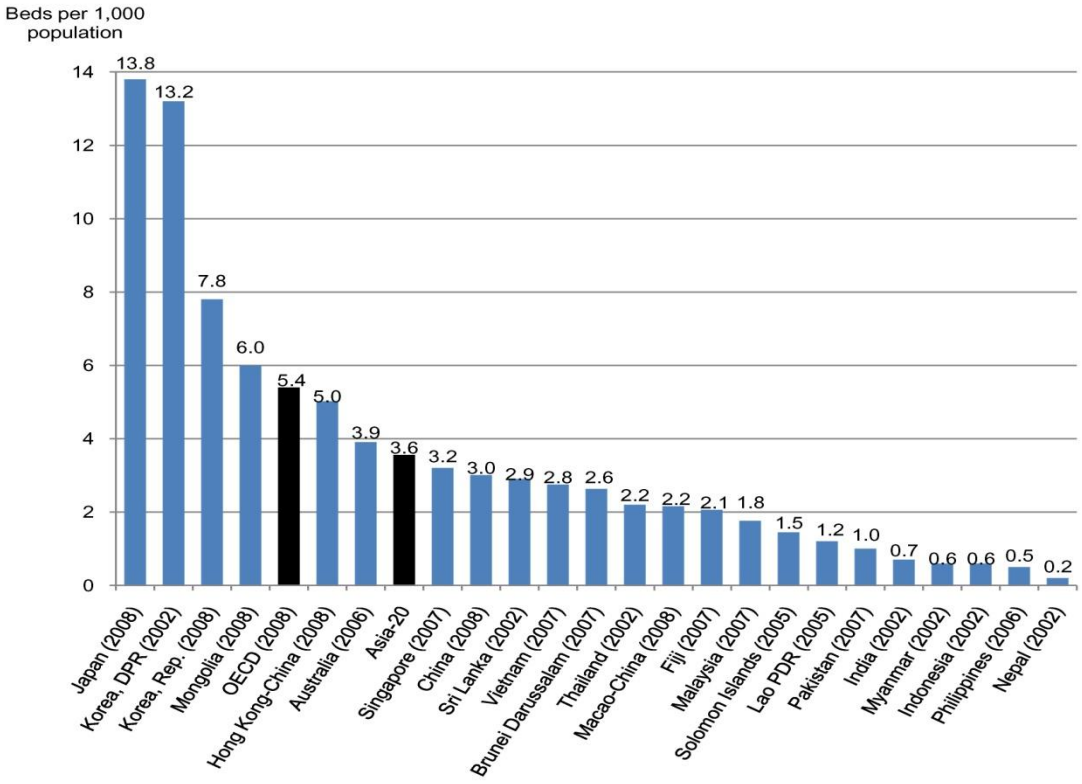
For further reading

Refer to Annex A.

Definition and measurement

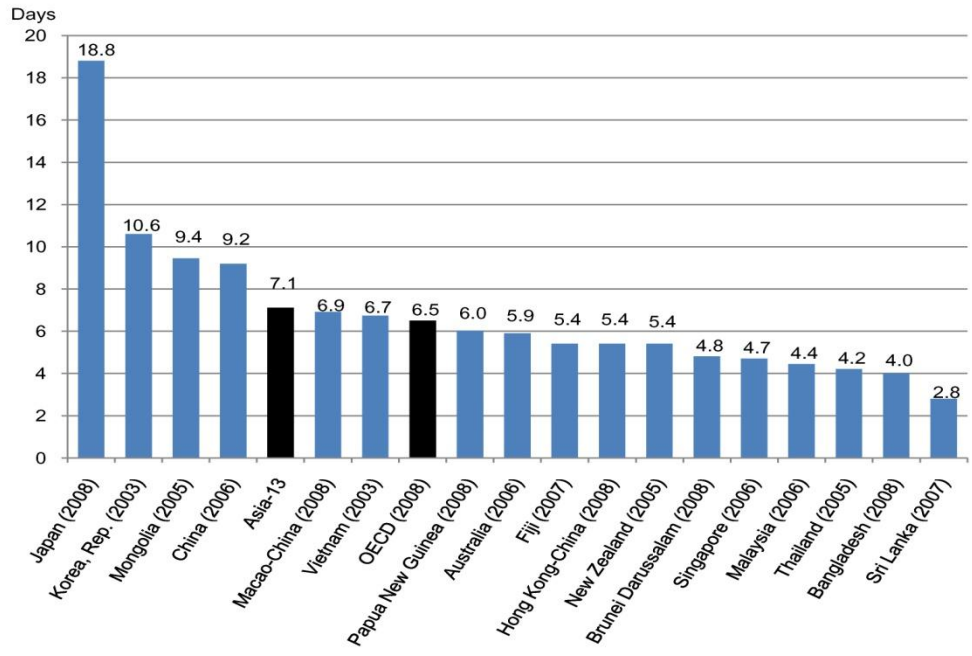
All hospital beds should normally be counted, including those for acute care and for chronic/long-term care, in both the public and private sectors. The figures reported for ALOS are for average length of stay for acute care only. This refers to the number of days (with an overnight stay) that patients spend in an acute-care inpatient institution. It is generally measured by dividing the total number of days stayed by all patients in acute-care inpatient institutions during a year by the number of admissions or discharges. This definition requires a consistent definition of acute care, but there are considerable variations in how countries define acute care, and what they include or disaggregate in reported statistics. For the most part, reported ALOS data in the developing economies of the Asia/Pacific region cover only public sector institutions, and only a few countries, such as China, Mongolia and Thailand, comprehensively cover private sector institutions in their ALOS statistics. Consequently, most of the statistics reported here relate to public hospitals only.

3.3.1. **Hospital beds per 1,000 population, 2008 (or nearest year available)**



Sources: OECD Health Data 2010; WHO, 2010d.

3.3.2. **Average length of stays for acute care in hospitals, 2008 (or nearest year available)**



Sources: OECD Health Data 2010; National Data Sources (see Annex 1).

Hospital discharge rates are a measure of the number of people who stay overnight in a hospital each year. Together with the average length of stay, they are important indicators of the level and pattern of hospital activities. The discharge rates presented here are not age-standardised, meaning that they do not take into account differences in the age structure of the population in different countries. Hospitalisation rates tend to be higher among elderly people than in younger persons.

There is a large variation in hospital discharge rates between countries in the Asia/Pacific region, with the rate being seven-times higher in some countries than others (Chart 3.4.1). Hospital discharge rates in the developing economies of the Asia/Pacific region tend to be significantly lower than in OECD countries, but the rates in the high-income Asian economies are comparable to those in the OECD (e.g., Hong Kong-China). Furthermore, the discharge rates in some developing economies are also comparable to those in OECD countries (e.g., Mongolia, Thailand, Sri Lanka).

Within the region, the highest rates are in Sri Lanka, Hong Kong-China and Mongolia, with hospitalisation rates significantly higher than the OECD average, although there are some OECD countries that have even higher rates (e.g., Austria, France, Germany). Discharge rates are lowest in Papua New Guinea, Bangladesh and China. In general, those countries that have more hospital beds tend to have higher discharge rates, and vice versa (see section 3.3 – "Hospital beds"). This suggests that low hospital discharge rates in some countries are an outcome of low availability of hospital beds, which may be driven by low levels of public financing for inpatient care.

As the disease conditions vary between countries in the region, further comparison of hospital discharge rates would require examining rates by specific disease. This type of comparison is difficult however, since most of the countries in the region do not publish hospital discharge statistics by diagnosis. Charts 3.4.2 and 3.4.3 illustrate the value of such a comparison for two diseases. Discharge rates for circulatory disease tend to vary in a similar manner to that of overall discharges. But there are some striking variations in discharge rates for asthma, which can be considered an indicator of "avoidable hospitalisation" and might reflect shortcomings of the primary care sector (OECD, 2009a). Discharge rates for asthma in Sri Lanka and Brunei Darussalam are substantially higher than in other economies, indicating a high prevalence of under-treated asthma in the community requiring hospital admission.

For further reading

Refer to Annex A.

Definition and measurement

A discharge is defined as the release of a patient who has stayed at least one night in hospital, including discharges following normal childbirth. It includes deaths in hospital following inpatient care. Same-day separations are usually excluded, but insufficient information is available to assess the extent to which this definition is adhered to in the available data for most countries in the region.

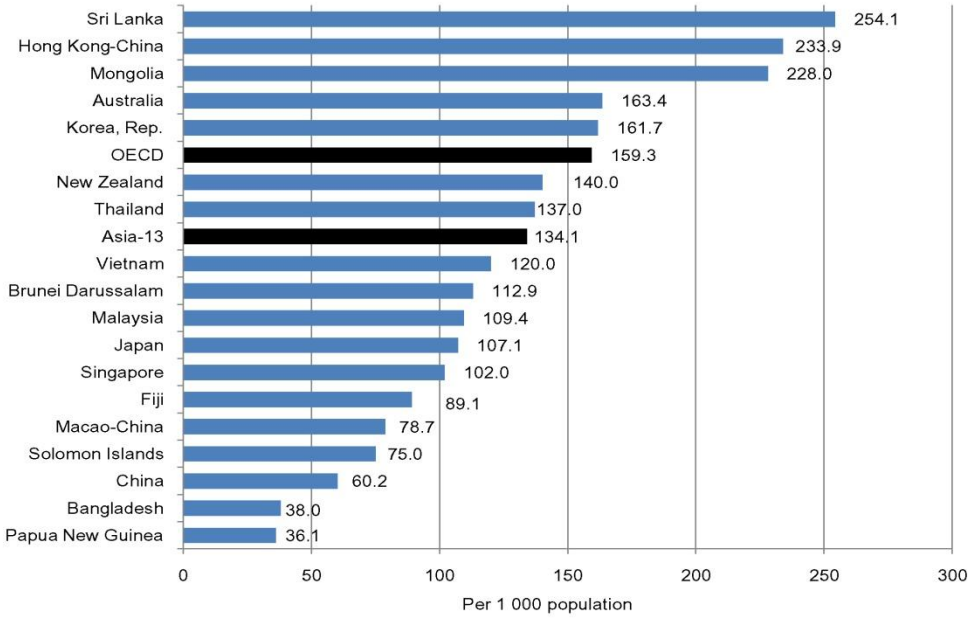
There are three potential data sources on discharge rates: administrative data, hospital surveys and household health surveys. As in OECD countries, the estimates from administrative sources tend to be higher than those from household health surveys because of incorrect recall and non-response rates. The figures presented here come mostly from administrative sources.

In several countries, administrative data are routinely collected and published for discharges from both public sector and private sector hospitals, but in Brunei Darussalam and Sri Lanka these data are only collected from public sector institutions. In some countries, such as Fiji or Solomon Islands, the number of private hospital discharges is nil or negligible, so lack of coverage of private hospitals does not prevent estimation of overall discharge rates.

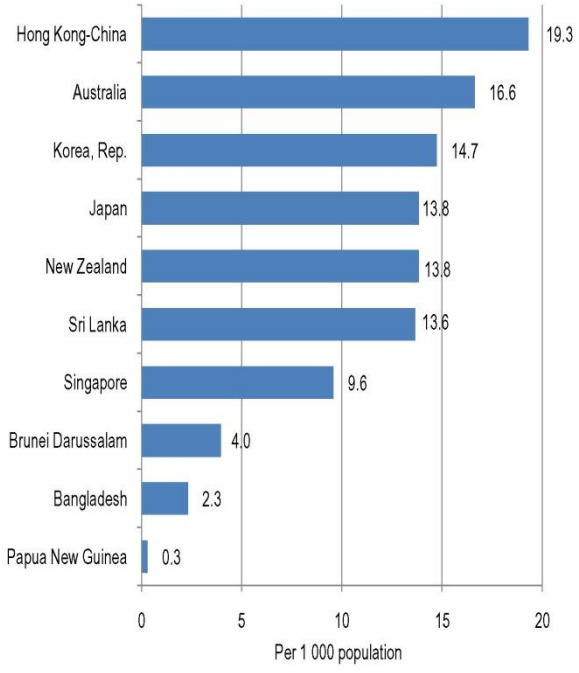
In those countries where administrative data do not cover private hospital discharges and these are significant in number, other data sources have been used. In Sri Lanka, the rate of private hospital discharges is derived from surveys of private hospitals. In Bangladesh, the rate of private hospital discharges has been estimated by using household survey data to derive the ratio of private hospital discharges to public hospital discharges. In Brunei Darussalam, the number of private hospital discharges was estimated by assuming that the bed-turnover rate in private hospitals was the same as that in public hospitals.

In Singapore, the published data exclude normal deliveries, and these have been estimated and added to improve comparability. For other economies, the exact scope of reported data is not always clear, and so other inconsistencies may remain.

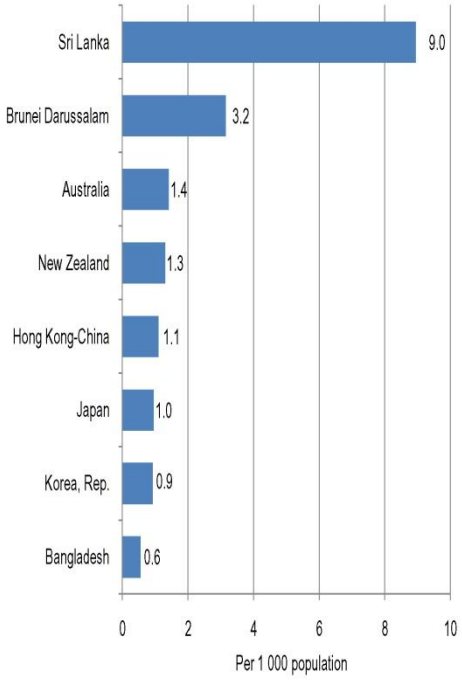
3.4.1. **Hospital discharges per 1 000 population, 2008 (or nearest year available)**



3.4.2. **Hospital discharges for circulatory disease per 1 000 population, 2008 (or nearest year available)**



3.4.3. **Hospital discharges for asthma per 1 000 population, 2008 (or nearest year available)**



Sources: OECD Health Data 2010; National Data Sources (see Annex 1).

The provision of medical care and counselling during pregnancy and birth has an important effect on the survival of both the mother and the child.

Many health problems in pregnant women can be prevented, detected or treated during antenatal care visits with trained health workers. The World Health Organization recommends a minimum of four antenatal visits comprising of pregnancy monitoring, managing problems such as anaemia, counselling and advice on preventive care and diet, and encouragement to deliver in a health care facility with skilled health personnel. During the period 2000–2009, around three quarters of pregnant women in the Asia/Pacific region had at least one antenatal visit (Figure 3.5.1). In Nepal and the Lao PDR, however, less than half of all expectant mothers received antenatal care. Since the 1990s, the proportion of pregnant women in developing countries who had at least one antenatal visit has increased from around 64% to around 80% in 2008.

The major risk factor for maternal and neonatal deaths is lack of access to skilled care at birth (WHO, 2008a). In many countries in the region, almost all births are attended by skilled health professionals such as doctors, nurses or midwives, but there are several countries where the proportion is much lower (Figure 3.5.2). Less than 20% of births in Bangladesh are attended by a medically trained provider, with most deliveries (63%) assisted by *dais*, or untrained birth attendants. In Pakistan, around 40% of births are attended by medically trained persons, with traditional birth attendants assisting with more than half of deliveries (52%). Traditional birth attendants also maintain an important role in Indonesia, especially in rural settings. However, there has been an increase in the proportion of births assisted by medical professionals in the last decade, reaching 73% in 2007. The Indonesian Ministry of Health has set 2010 as the target for 90% of births to be assisted by skilled health professionals.

The risk of birth complications and infections for both mothers and babies can be reduced by proper medical attention and hygienic conditions. In Bangladesh, only 15% of births take place in a health facility, with the majority taking place at home (Figure 3.5.3). One-third of deliveries in Pakistan take place in a health facility, with the other two-thirds taking place at home. Delivery in a health facility is more common among mothers giving birth for the first time, or those who have had at least four antenatal visits, as well as among mothers living in urban regions (NIPS & Macro International Inc., 2008). In Australia, almost all deliveries take place in a health facility.

Poverty is the overarching reason why developing countries in the region have poor standards of maternal and newborn health. There is, for example, a strong association between household wealth and having a birth attended by skilled health personnel (Figure 3.5.4). In Bangladesh and Nepal, less than 5% of the poorest mothers receive medical attention, and in a number of other countries well under half of mothers in the poorest wealth quintile receive medical care at birth.

For further reading

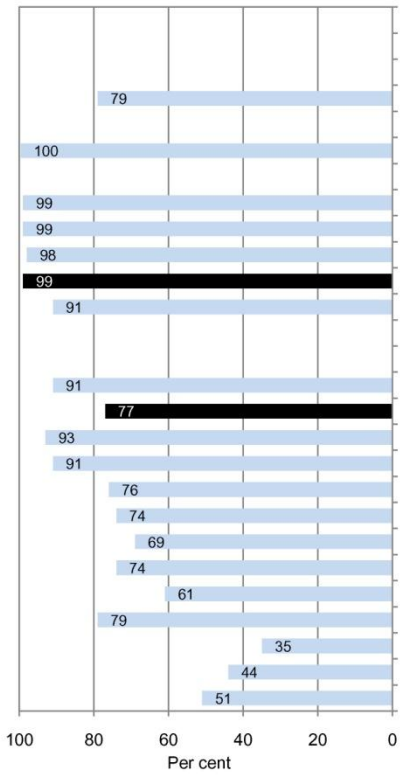
DHS (Demographic and Health Surveys) (2006-2009), *DHS Final Reports*, http://www.measuredhs.com.

Definition and measurement

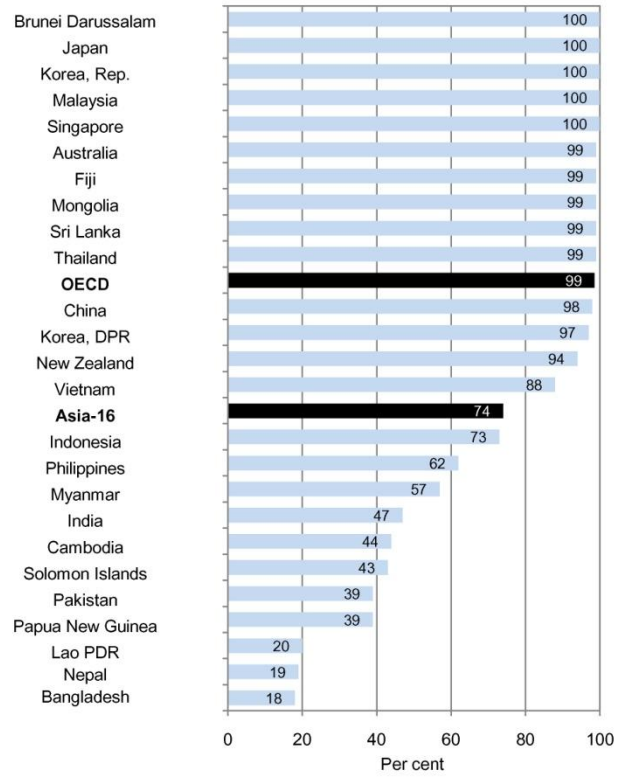
The major source of information on care during pregnancy and birth are health interview surveys. Demographic and Health Surveys (DHS), for example, are nationally-representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Standard DHS Surveys have large sample sizes (usually between 5 000 and 30 000 households) and typically are conducted every five years, to allow comparisons over time.

Women who had a live birth in the five years preceding the survey are asked questions about that birth, including whether any antenatal care was received and what type, who provided assistance during delivery, and where the delivery took place.

3.5.1. At least one antenatal visit during last pregnancy, 2000-2009

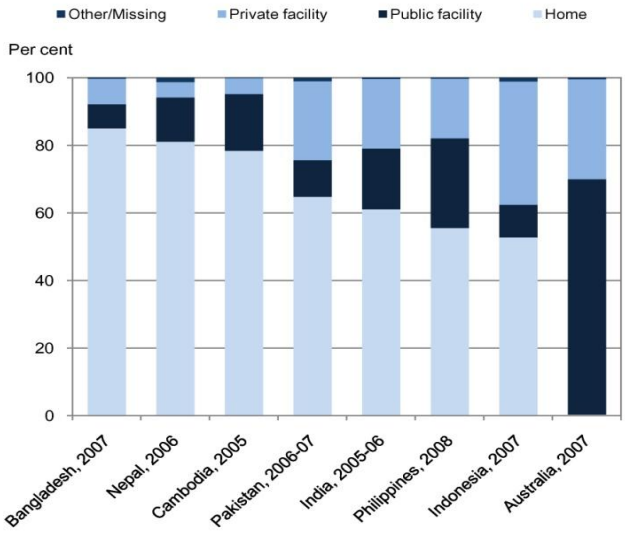


3.5.2. Births attended by skilled health personnel, 2000-2008



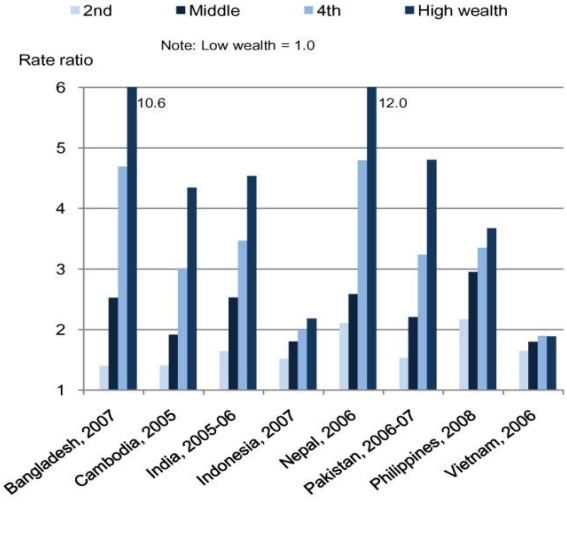
Source: WHO, 2010d.

3.5.3. Place of delivery, 2007 or nearest year available



Sources: DHS 2006-2009; Laws & Sullivan, 2009.

3.5.4. Births attended by skilled health personnel, by wealth quintile



Sources: DHS 2006-2009; MICS 2006-2008.

Childhood vaccination continues to be one of the safest and most cost-effective health policy interventions. Most countries in the Asia/Pacific region have established vaccination programmes, although schedules vary by country and depend primarily on the local epidemiology of the vaccine-preventable disease and an ability to finance the vaccine. The World Health Organization recommends that all countries immunize against diphtheria, hepatitis B, measles, pertussis, poliomyelitis, and tetanus. Countries with a substantial disease burden due to *haemophilus influenzae* type B (Hib), tuberculosis (TB) or yellow fever are also encouraged to introduce appropriate vaccines into their schedule.

Many countries in the region maintain high immunization coverage (Figure 3.6.1), but millions of infants remain unimmunized and large numbers of annual deaths from preventable diseases continue to occur. Challenges persist in increasing coverage in countries such as the Lao PDR, Papua New Guinea and India, where coverage for diphtheria-tetanus-pertussis, measles and hepatitis B is estimated to be below 70%.

Although measles deaths in the region declined by 46% between 2000 and 2008, this was well below the global average of 78%. Three quarters of all measles deaths in 2008 occurred in India. Since 1990, diphtheria outbreaks have been reported in the Lao PDR, Mongolia, Papua New Guinea and Thailand. Hepatitis B is endemic in most countries in the Asia/Pacific region, with an estimated 260 million chronic carriers (WHO, 2008a).

Immunization rates across the region continue to increase (Figure 3.6.2). Coverage for diphtheria-tetanus-pertussis (DTP) and measles increased throughout the 1980s as countries established national immunization programmes, and peaked in 1990 as a result of the WHO-led drive to achieve universal childhood immunization. Hepatitis B coverage has also increased steadily since 1990, as more countries introduce the vaccine into their schedules. Since then, average reported coverage for DTP, measles and hepatitis B across the region has risen steadily to approach 90%.

Underserved and hard-to-reach populations are especially at risk. Children born into poor households in countries such as India, Indonesia, the Lao PDR and Pakistan are many times less likely to receive a full course of immunization than children in wealthier households (Figure 3.6.3). Other countries in the region, including Bangladesh, Mongolia and Thailand, demonstrate greater equity.

Other challenges include ensuring vaccine quality and safety, enhancing disease surveillance and laboratory capacity and improving vaccine security. Although national governments provide much of the finance for childhood immunization, many countries are also dependent on donors and external aid, and changes in donor priorities may jeopardise programmes (WHO, 2008a). Routine immunization in many countries throughout the region is being strengthened through the Global Alliance for Vaccines and Immunisation (GAVI), a global health partnership representing stakeholders in immunization from both private and public sectors.

For further reading

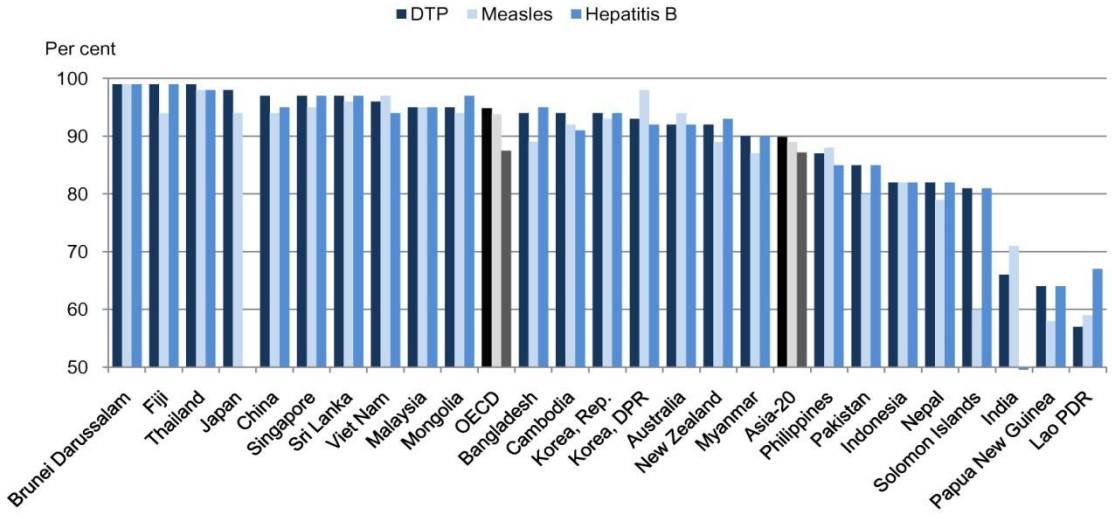
WHO (2009), *WHO Vaccine-Preventable Diseases: Monitoring System. 2009 Global Summary*, Geneva, WHO.

Definition and measurement

Vaccination rates reflect the percentage of 1-year-old children who have received the respective vaccination in the recommended timeframe. DTP = three doses of diphtheria-tetanus-pertussis vaccine; Measles = measles-containing vaccine (MCV); Hepatitis B = three doses of hepatitis B vaccine.

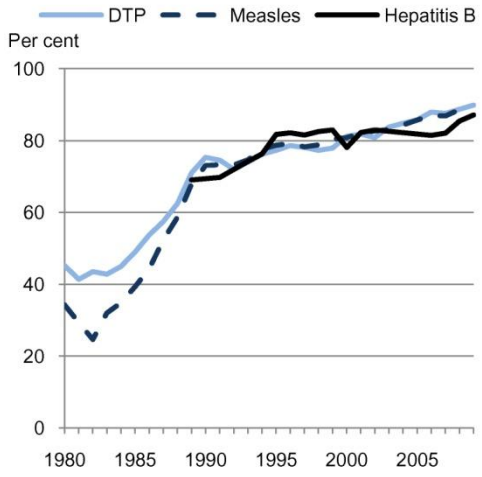
Data are WHO/UNICEF estimates of national immunization coverage, derived from officially reported data by Member States to WHO, as well as from published literature and ministry of health surveys. Since childhood vaccination policies differ slightly across countries, the indicator is based on the actual policy in a given country.

3.6.1. **Estimated infant vaccination rates for DTP, measles and hepatitis B, 2009**



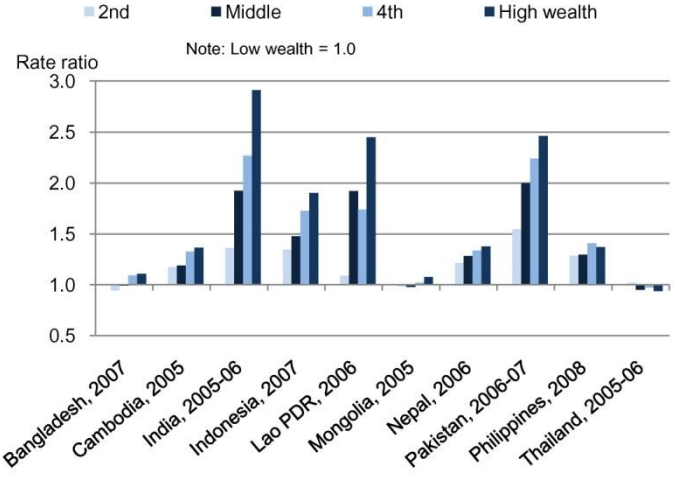
Source: WHO, 2010c.

3.6.2. **Estimated infant vaccination rates for DTP, measles and hepatitis B, Asia-20 countries, 1980-2009**



Source: WHO, 2010c.

3.6.3. **Children aged 1-2 who had received all basic vaccinations[a], by wealth quintile**



(a) BCG, measles and 3 doses each of DPT and polio vaccine.
Sources: DHS 2006-2009, MICS 2006-2008.

Chapter 4

Health Expenditure and Financing

4.1 Health expenditure per capita
4.2 Health expenditure in relation to GDP
4.3 Financing of health care
4.4 Health expenditure by function
4.5 Health expenditure by provider

Differences in health spending levels per capita reflect differences in overall income levels (GDP), as well as countries' diverse financing and the organisational structures of their health systems.

Much variation in health spending levels can be observed among Asia/Pacific countries (Figure 4.1.1), ranging from Australia with a total health spending per capita of USD 3 448 PPP to Myanmar with spending of only USD 24 PPP. The average OECD spending per capita in 2008 was around six times that of the Asian economies (3 060 versus 526).

The share of public spending in total health spending is much lower in Asia compared to OECD countries: 59% versus 72% respectively. The lowest share of public spending in Asia/Pacific countries was reported in Myanmar (10%), the highest in the Solomon Islands (93%), followed by Brunei Darussalam (81%) and Japan (80.3%).

On average, between 1998-2008, the growth rate in per capita health spending in real terms was 4.9% per year in Asia, higher than the 4.1% observed across OECD countries (Figure 4.1.2). The growth rate for Cambodia, China, the Republic of Korea, and Vietnam was even more rapid – almost twice the average rate for the region. The 13.6% growth rate observed for Myanmar – the highest among all countries– should be understood in the context of very low initial spending per capita.

Three countries – Brunei Darussalam, Papua New Guinea, and Nepal - reported a decline in health spending per capita in real terms between 1998 and 2008. In particular, Brunei Darussalam reported a negative growth of 5.9% per year (on average) over the past decade, as compared to a positive growth of GDP (0.2%). A strong pressure to reduce government spending (which accounted for 80% on average over the decade), and a decline in household final consumption expenditure explains this trend.

In general, health expenditure per capita increases with per capita GDP. Figure 4.1.3 shows the relationship between per capita health expenditure and per capita GDP in 2008 (on a logarithmic scale). This underlines the existence of a close relationship between income and health spending in the Asia/Pacific region, which parallels that seen among OECD economies as a whole. On the top right of Figure 4.1.3 is a group that includes OECD countries, Singapore, and Brunei Darussalam that have high income and high spending. China, Malaysia, and Thailand are three middle-income and middle-spending countries. There is evidence of a transition for those countries towards a high income – high spending situation.

For further reading

OECD (2000), *A System of Health Accounts,* version 1.0, OECD, Paris.

WHO (2003), *Guide to producing national health accounts: with special applications for low-income and middle income countries,* World Health Organization, Geneva.

WHO (2010), *National Health Accounts country data,* World Health Organization, Geneva.

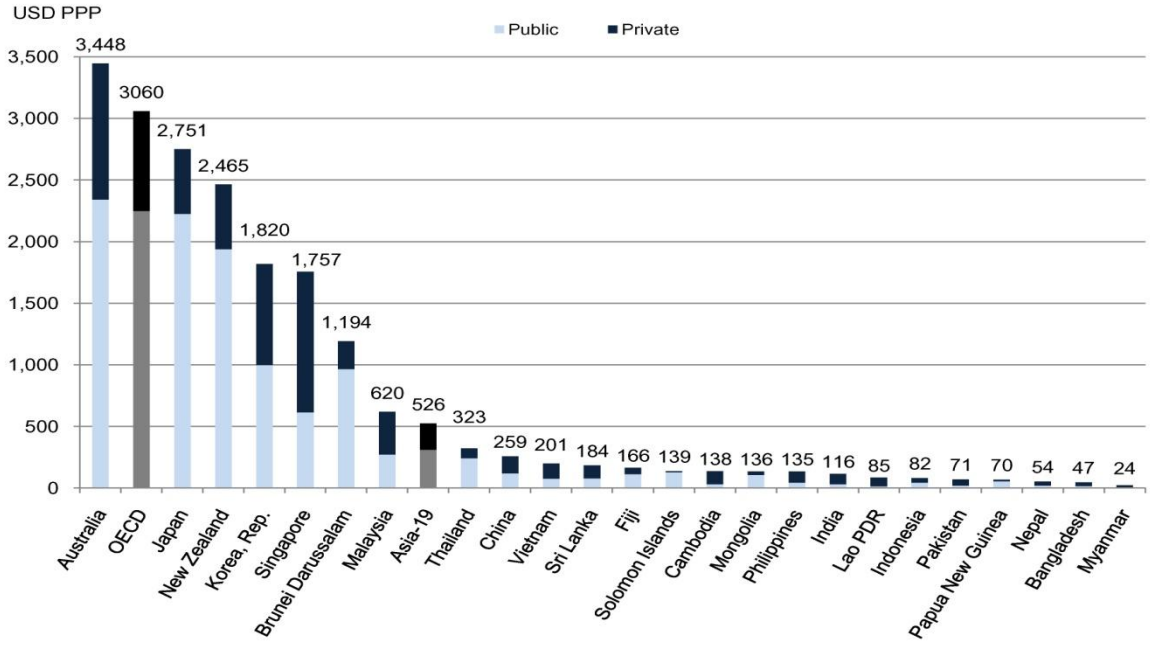
Definition and measurement

Total health expenditure is defined as the sum of expenditure on all core health care functions – that is, total health care services, medical goods dispensed to outpatients, prevention and public health services, and health administration and health insurance - plus capital formation in the health care provider industry. Expenditure on these functions is included as long as it is borne for final use of resident units, i.e. as long as it is final consumption by nationals in the country or abroad.

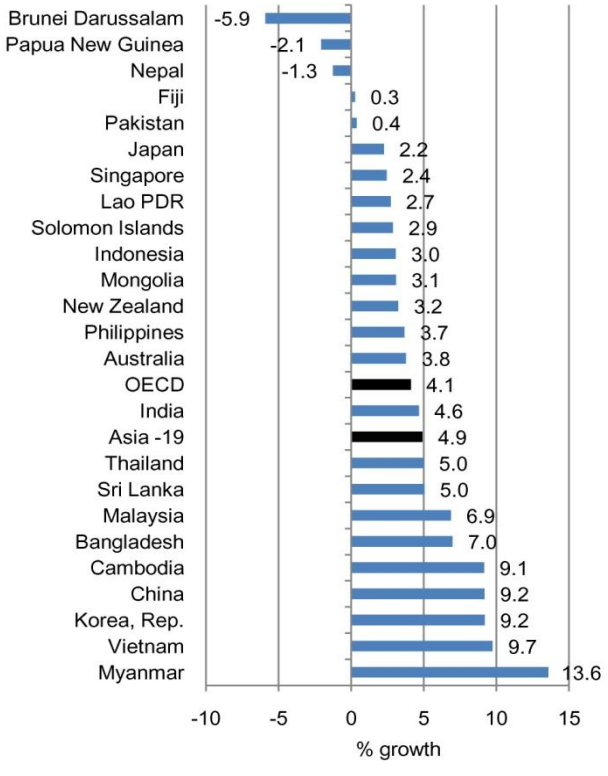
The economy-wide (GDP) purchasing power parities (PPPs) are used to compare spending across countries as they are the most available and reliable conversion rates. These PPPs are based on a broad basket of goods and services, chosen to be representative of all economic activity. The use of economy-wide PPPs means that the resulting variations in health expenditure across countries will reflect not only variations in the volume of health services, but also any variations in the prices of health services relative to prices in the rest of the economy.

To make useful comparisons of real growth rates over time, it is necessary to deflate (i.e. remove inflation from) nominal health expenditure through the use of a suitable price index, and also to divide by the population, to derive real spending per capita. Due to the limited availability of reliable health price indices, an economy-wide (GDP) price index is used in this publication, based on 2005 GDP price levels.

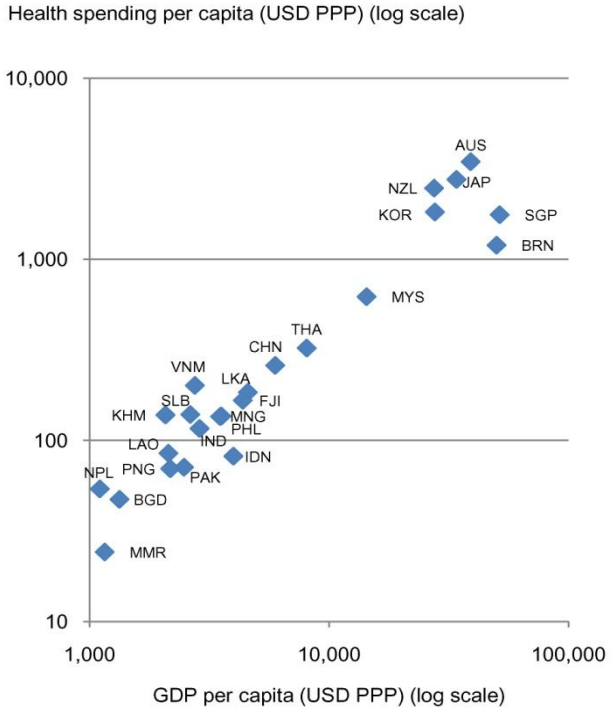
4.1.1. Total health expenditure per capita, public and private, 2008



4.1.2. Annual average real growth in per capita health expenditure, 1998-2008



4.1.3. Total health expenditure per capita and GDP per capita, 2008



Sources: WHO National Health Accounts database (2010); World Bank (for GDP deflator).

Health expenditure as a percentage of gross domestic product (GDP) in 2008 was 4.3% on average in the Asian region. This share varied from 2% in Indonesia up to 9% in New Zealand (Figure 4.2.1). Generally, the richer a country, the more it spends on health as a percentage of GDP. But there are exceptions. Vietnam and Cambodia, for example, allocated a relatively high share of their GDP to health, even though their GDP per capita is lower than in many other Asian countries. The percentage of GDP allocated to health in 2008 across OECD countries is – on average – twice that of the Asian countries and economies (9 versus 4.3).

Between 1998-2008, the share of GDP allocated to health increased in Thailand, was generally stable in China and Indonesia, while the share slightly declined in India (Figure 4.2.2). This share increased rapidly in the Republic of Korea, while the increase was more modest in Japan. Indonesia reported the lowest figure among the countries studied, at less than 2%. The comparative analysis of the share of health spending in GDP over time highlights the different priority given to the health sector in different countries: from a similar situation in 1998 (around 4.3% of GDP spent on health), the Republic of Korea spent 50% more on health – in terms of share in GDP - compared to India in 2008.

As in OECD countries, health spending growth in many Asia/Pacific countries has exceeded economic growth over the past ten years, resulting in an increasing share of the economy devoted to health in most countries (Figure 4.2.3). The income elasticity for health care during that 10-year period was 1.1 in Asia, as compared to 1.6 in OECD countries. All economies above the diagonal line report an income elasticity above one. This means that the share of health expenditure in total expenditure has increased between 1998 and 2008. In all economies below that line, the increase in health spending – on average – is lower that the increase in GDP. Hence the share of health spending in total spending has declined.

In China, health spending has grown at almost the same rate as overall economic growth over the past ten years, a growth rate of over 9% per year per capita. In India, the income elasticity was 0.8, meaning that health spending growth has not kept pace with economic growth.

The Republic of Korea and Japan have shown the highest income elasticity over the last ten years (1.9), even if at a different level of real per capita growth (on average) in health spending (9.2% in the Republic of Korea and 2.2% in Japan).

For further reading

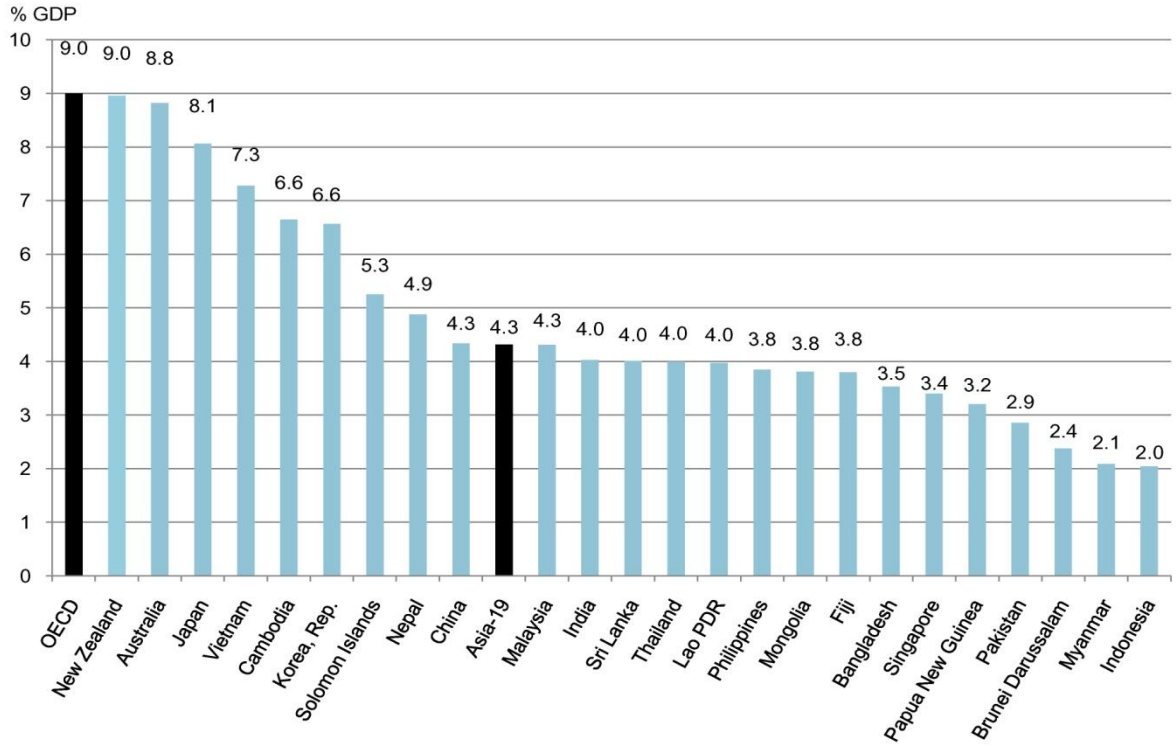
WHO (2010), *National Health Accounts country data,* World Health Organization, Geneva.

Definition and measurement

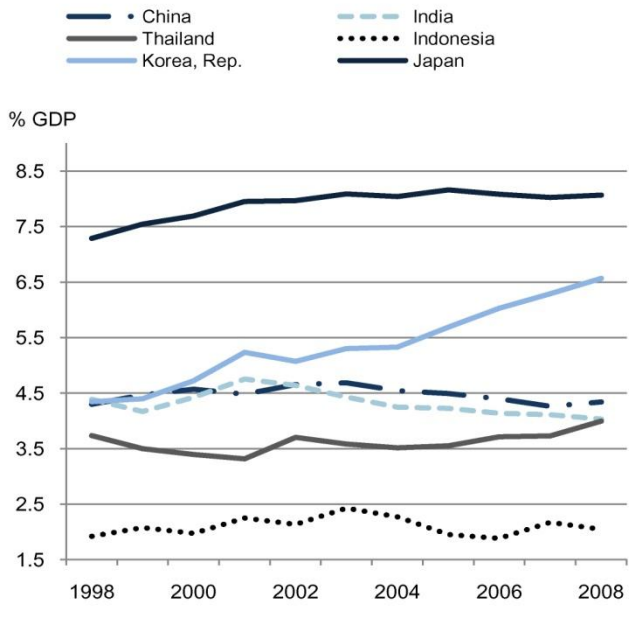
See indicator 4.1 for the definition of total health expenditure.

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.

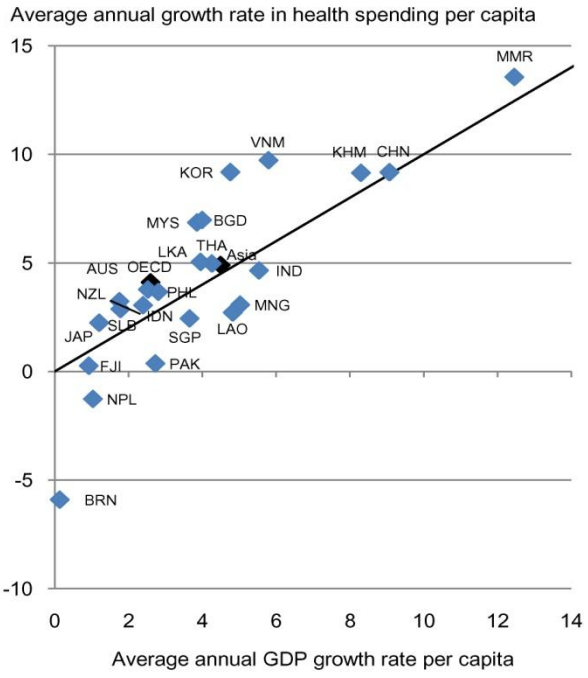
4.2.1. **Total health expenditure as a share of GDP, 2008**



4.2.2. **Total health expenditure as a share of GDP, 1998-2008, selected countries**



4.2.3. **Health expenditure growth and GDP growth, 1998-2008**



Sources: WHO National Health Accounts database (2010); World Bank (for GDP deflator).

Figure 4.3.1 shows that, on average, the public share of health spending has slightly increased in Asian countries, from 43% in 1998 to 45% in 2008. This is about the same share as in the United States, but is much lower than the average in OECD countries, where the public sector accounted for 72% of financing in 2008, similar to 1998. In Thailand, Mongolia, Papua New Guinea, Brunei Darussalam, and the Solomon Islands, public financing accounted for more than 70% of all health expenditure, while it accounted for less than 30% in Pakistan, India, Cambodia, and Lao PDR. Myanmar reported only 11% of public health spending in total health spending.

The public share of health spending has increased significantly over the past ten years in Thailand and Indonesia (+ 20 points of share), while it has decreased importantly in Singapore and the Philippines (- 10 points).

The split between the various financing agents for selected countries is shown in Figure 4.3.2. General government accounts for 57% of total health expenditure on average, being the main financing source in relatively high-income economies. Throughout the region, there is wide variation in the public share (that is general government + social security funds), ranging from 28% in Bangladesh and 42% in Tianjin (China), up to 70% in Mongolia and 80% in Japan and New Zealand. In five economies - Bangladesh, Tianjin (China), Malaysia, Hong Kong-China and Sri Lanka - less than 50% of health spending comes from public funds.

There are various systems of public funding: Australia, Bangladesh, Hong Kong-China, Malaysia, Mongolia, New Zealand, Sri Lanka and Thailand are almost exclusively general government funded. Japan and the Republic of Korea fund the public part of health mainly through the social insurance schemes paid by employer and employee contributions. In Bangladesh, 63% of total health expenditures comes from households out-of-pocket payments. Of the other economies, the out-of-pocket share varies from lows of 14% and 15% in New Zealand and Japan up to 43% and 50% in Sri Lanka and Tianjin (China) respectively.

In general, private household out-of-pocket payments, comprising direct payments and cost-sharing payments, form the greater part of private funding sources (Figure 4.3.3). In India, Nepal, Vietnam, Singapore, Bangladesh, Myanmar, China, and Brunei Darussalam, out-of-pocket health spending represents 90% or more of private health spending. Private health insurance plays a role in Thailand, Malaysia, Fiji and the Philippines, in addition to OECD countries in the region. In all these countries, private health insurance covers at least 10% of private health spending.

For further reading

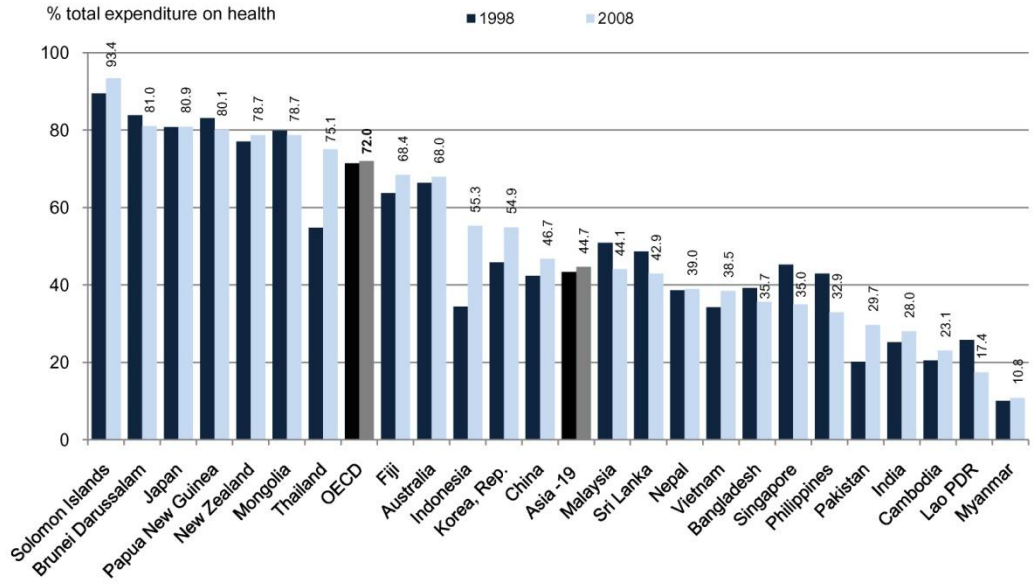
WHO (2010), *National Health Accounts country data*, World Health Organization, Geneva.

Jeong, H.-S. and Rannan-Eliya, R.P. (2010), *SHA-Based Health Accounts in Twelve Asia/Pacific Economies: A Comparative Analysis*, SHA Technical Papers No. 10, OECD/Korea Policy Centre, Seoul.

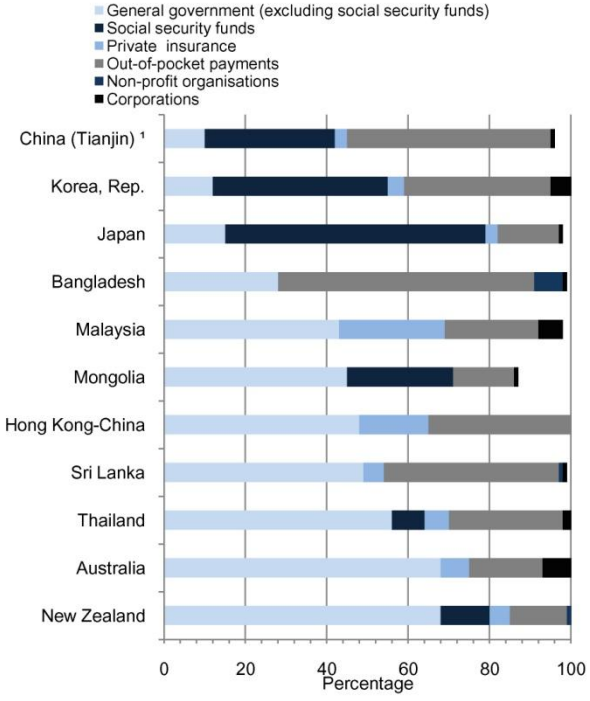
Definition and measurement

The financing classification used in the System of Health Accounts (OECD, 2000) provides a complete breakdown of health expenditure into public and private units incurring expenditure on health. Public financing includes general government revenues and social security funds. Private sector comprises private insurance, household out-of-pocket expenditure, non-profit institutions and corporations. Private insurance covers both private social insurance and private insurance enterprises. Out-of-pocket payments are expenditures borne directly by the patient. They include cost-sharing and, in certain countries, estimations of informal payments to health care providers.

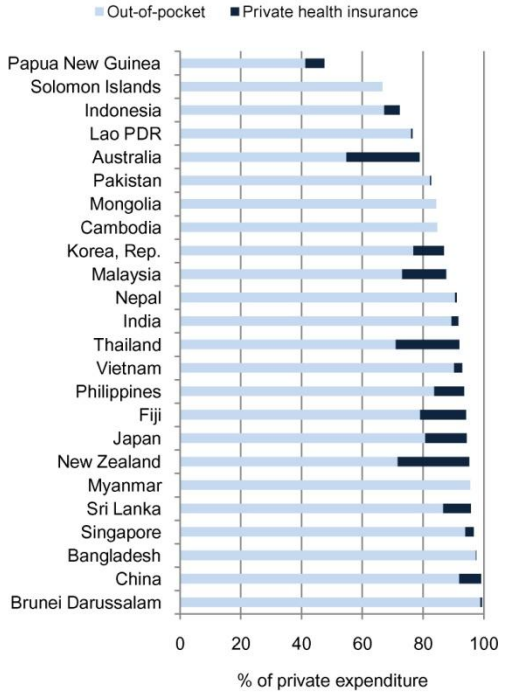
4.3.1. Public share of total expenditure on health, 1998 and 2008



4.3.2. Share of total health expenditure by financing agent, around 2006



4.3.3. Out-of-pocket and private health insurance spending as a share of private expenditure, 2008[2]



1. In China, the figures refer to the Tianjin municipality only, which may not be representative of the rest of the country.
2. The rest of private health expenditure comprises non-profit institution serving households and corporations (other than health insurance)

Sources: Jeong & Rannan-Eliya (2010); WHO National Health Accounts database (2010).

The average percentage of total health spending devoted to personal medical services and goods equals 86% among a group of Asia/Pacific countries for which a detailed breakdown of expenditure by function of care is available. This ranges from a low of 78% in Bangladesh to a high of 93% in Japan (Figure 4.4.1).

In terms of the split between personal medical services and goods, personal medical services comprise 67% of the total health spending, with the remaining 19% being spent on medical goods, mainly pharmaceutical goods. Bangladesh and the Tianjin (China) devote the highest proportion of expenditure on medical goods (44% and 39%), while Malaysia and Thailand the lowest (7% and 4% respectively).

Differences in the level of expenditure on personal medical services partly reflect differences in the dispensing of pharmaceutical goods and in medical practice, as well as how expenditures are currently classified. In many economies (e.g., Sri Lanka, Thailand, Hong Kong-China), physicians dispense medicines as part of their overall delivery of ambulatory care services, and the cost of the dispensed medication is not explicitly charged to the patient, but instead is included as part of the cost of the diagnostic or consultation fee.

Regarding the categorisation of current public expenditure on health by mode of production (Figure 4.4.2), curative and rehabilitative in-patient care accounts for around 45% of current public health expenditure, ranging from 30% in Tianjin (China) to 70% in Mongolia. Out-patient care accounts for slightly more than a quarter (26%) of current public health expenditure on health – ranging from 13% in Tianjin (China) to over 42% in Thailand. Only three countries reported expenditure on day care and home care services, most likely due to difficulties in recording separately those spending figures.

On average, 42% of household out-of-pocket spending on health pays for medical goods, 37% for out-patient care, and 20% for in-patient care (Figure 4.4.3). Thailand reports only 15% of OOP spent on medical goods, and 54% on out-patient care, while for Bangladesh 69% of households out-of-pocket health expenditure is on medical goods and 9% on in-patient care. In both cases, the comparability of the data with other countries may be low due to issues in the mapping of health spending categories.

For further reading

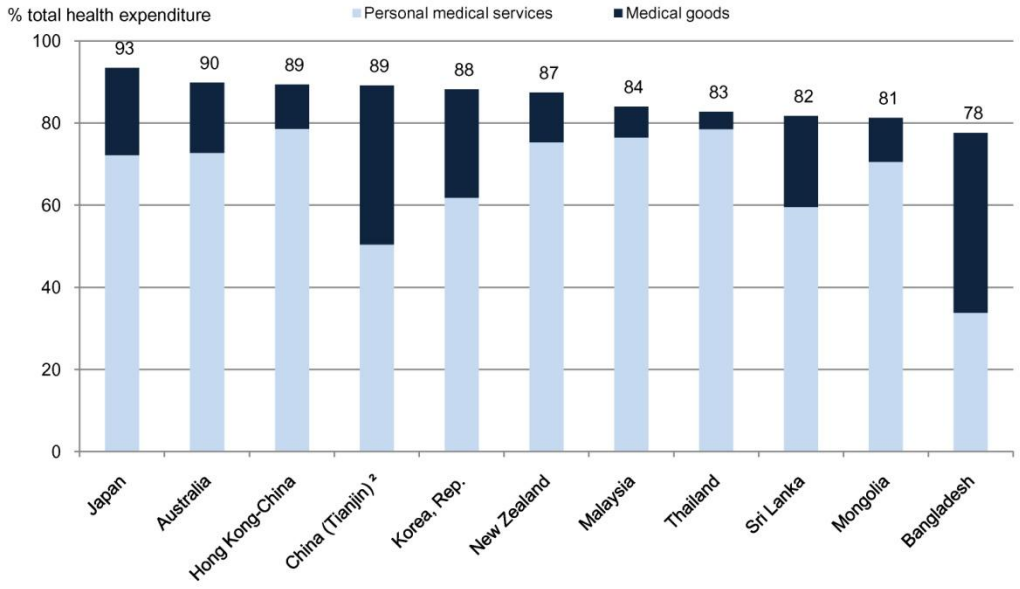
Jeong, H.-S. and Rannan-Eliya, R.P. (2010), *SHA-Based Health Accounts in Twelve Asia/Pacific Economies: A Comparative Analysis,* SHA Technical Papers No. 10, OECD/Korea Policy Centre, Seoul.

Definition and measurement

The functional approach of the *System of Health Accounts* (OECD, 2000) defines the boundaries of the health system. Current health expenditure comprises personal health care (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). Day care comprises health care services delivered to patients who are formally admitted to hospitals, ambulatory premises or self standing centres but with the intention to discharge the patient on the same day. An out-patient is not formally admitted to a facility (physician's private office, hospital out-patient centre or ambulatory-care centre) and does not stay overnight.

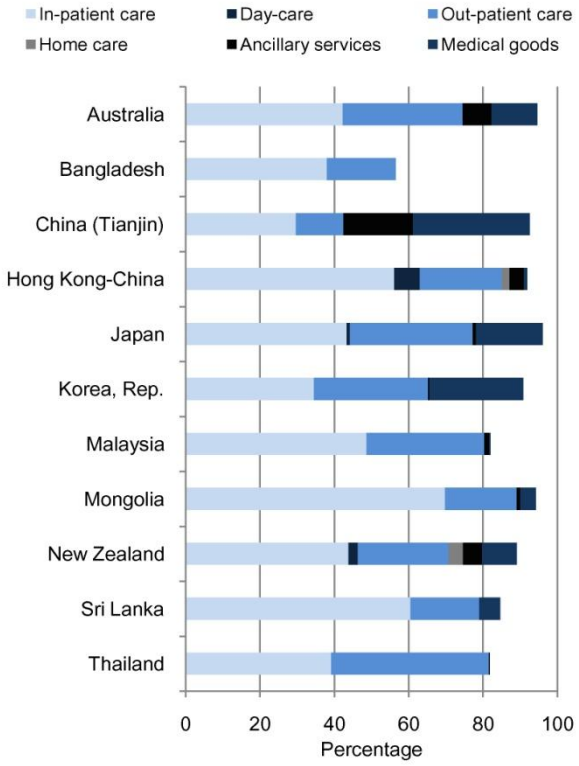
4.4.1. Medical goods and personal medical services as a share of total health expenditure, around 2006 [1]



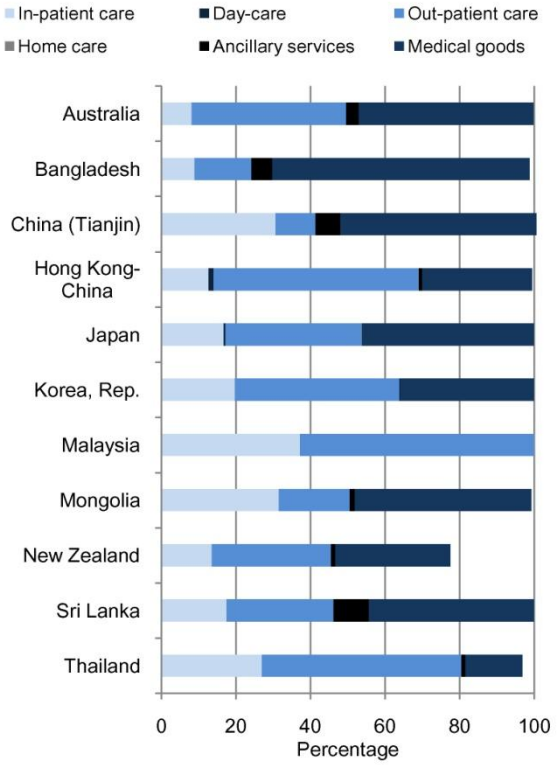
1. The rest of total heath expenditure comprises prevention and public health services, health administration and health insurance, and capital formation.

2 . In China, the figures refer to the Tianjin municipality only, which may not be representative of the rest of the country.

4.4.2. Share of current public health expenditure by mode of production, around 2006 [3]



4.4.3. Share of household out-of-pocket expenditure by mode of production, around 2006 [4]



3, 4. The rest of current public health expenditure comprises prevention and public health services, and health adminsitration and insurance.

Source: Jeong & Rannan-Eliya (2010).

In all of the countries and economies covered, other than Malaysia, hospitals account for the highest proportion of current health expenditure (Figure 4.5.1). The percentage varies between 30% in Bangladesh up to 72% in Thailand, with an average among the 11 Asia/Pacific economies of about 50%. Another 25% of current health expenditure is directed towards providers of ambulatory health care, ranging from 5%, only in Tianjin (China) up to 43% in Malaysia.

Retail sale and other providers of medical goods account for another 17% of current health expenditure, with a wide variation – between 4% in Thailand to 47% in Bangladesh. In New Zealand, nursing and residential care facilities account for 9% of current health expenditure. Other economies report low or no expenditures due to the small number of such establishments, though under-estimation in the health accounts is a contributory factor.

Of the remaining health provider categories, provision and administration of public health programmes accounts for around 3% on average and general administration of health around 5% of current health expenditure. By comparison, in OECD countries spending by hospitals is lower (29% of current health expenditure), while out-patient providers (31%), medical goods providers (21%), nursing and residential care facilities (12%) receive a higher share of health spending.

Hospitals are the main recipients of general government health financing – on average accounting for 65% of public health expenditure (Figure 4.5.2). The share varies from 42% in the Republic of Korea to 80% in Sri Lanka. The majority of the economies lie in a band between 70% and 80%. On average, 16% of public health funds are directed to ambulatory health care providers – varying from 4% in Tianjin (China) and 5% in Thailand up to 36% in Australia and 28% in Japan. In Japan, doctors' clinics play a considerable role in providing both inpatient and outpatient care. The share of public financing directed to providers of medical goods is relatively small (6% on average). The Republic of Korea has the highest proportion among the 11 economies (22%).

Public expenditures reported for nursing and residential care facilities accounted for less than 10% of public spending on health in the case of New Zealand, Hong Kong-China and Japan, and near zero for the other economies. Of the other provider categories, 5% is allocated to public health programmes on average, reaching 11% in Malaysia. General administration and insurance account for 6% of public funds on average, but it is more than 10% in the case of Bangladesh, Thailand, Malaysia and Mongolia.

The largest shares of household expenditure on health are directed towards providers of ambulatory care and medical goods – 32% and 35% respectively on average (Figure 4.5.3). However, there is large variation across economies. In Thailand and Tianjin (China), around 60% of households' health expenditure goes to hospitals, while in Australia, Bangladesh and New Zealand the equivalent figure is less than 10%. The share of households' total expenditure on health going to ambulatory care providers varies from as low as 6% and 11% in Tianjin (China) and Mongolia, to 48%, 50% and 56% in Australia, Malaysia and Hong Kong-China respectively. Finally, the share of households' total expenditure being paid for medical goods generally varies between 25% and 50%. The exceptions are Malaysia and Thailand (14% and 16% respectively), while at the other extreme is Bangladesh (70% of households' expenditure).

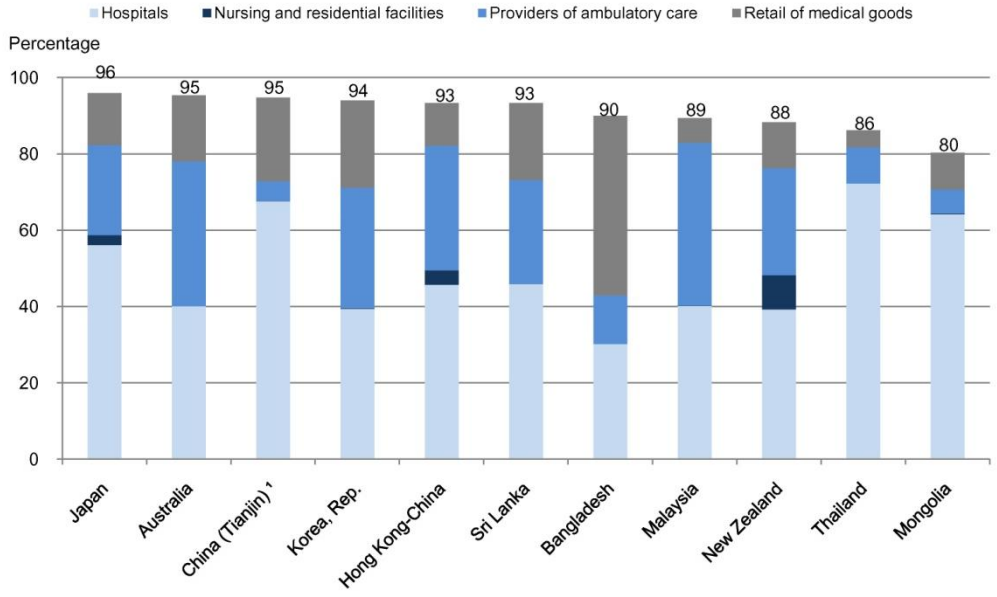
For further reading

Jeong, H.-S. and Rannan-Eliya, R.P. (2010), *SHA-Based Health Accounts in Twelve Asia/Pacific Economies: A Comparative Analysis,* SHA Technical Papers No. 10, OECD/Korea Policy Centre, Seoul.

Definition and measurement

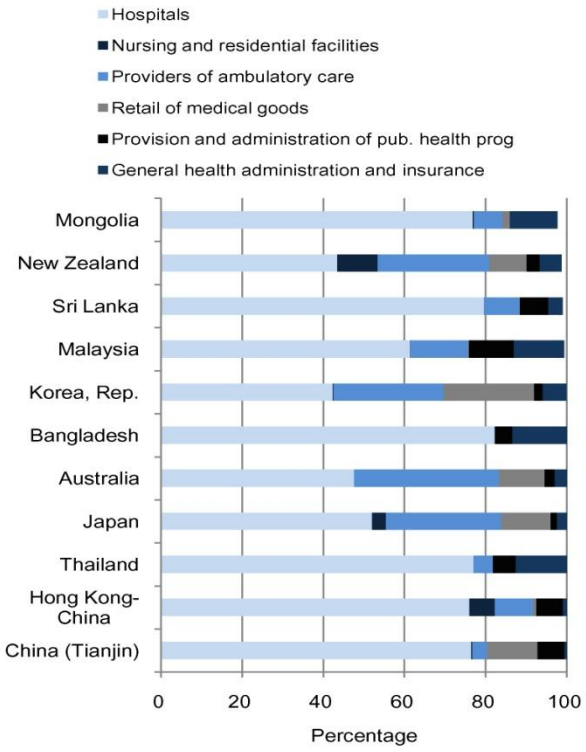
The provider classification of the *System of Health Accounts* (OECD, 2000) comprises both primary producers of health care and secondary producers. The principal activity performed by primary producers is health care services. Examples are hospitals or doctors' offices. Secondary producers provide health care services beside their principal activity as secondary activity. Examples are residential care institutions which provide mainly social services such as sheltered houses but in combination with health care services, for example intensive long-term nursing care or psychiatric care. Consequently, the SHA classifies both primary and secondary producers of health care and several classes in the provider classification may comprise both of them. Examples are retail sales of medical goods, administration, and nursing and residential care.

4.5.1. **Share of current health expenditure by provider, around 2006**

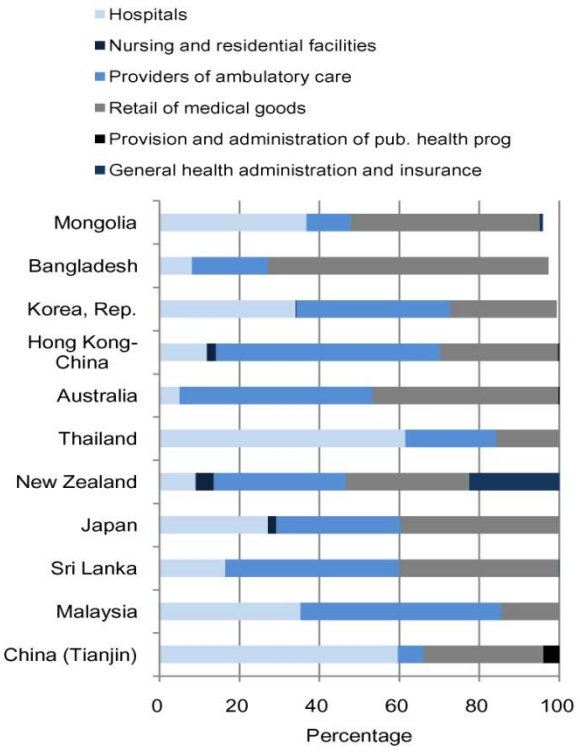


1. In China, the figures refer to the Tianjin municipality only, which may not be representative of the rest of the country.

4.5.2. **Share of public expenditure on health by provider, around 2006**



4.5.3. **Share of households expenditure on health by provider, around 2006**



Source: Jeong & Rannan-Eliya (2010).

ANNEX A: National Data Sources

Bangladesh

Data International (2010), *IARS 2006-07*, Data International for Ministry of Health and Family Welfare, Dhaka.

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Ministry of Health (2010), *Annual Health Bulletin 2007,* Ministry of Health, Colombo.

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ANNEX B: Additional Information on Demographic and Economic Contexts

Table A.1. **Total mid-year population, thousands, 1960 to 2008**

	1960	1970	1980	1990	2000	2008
Australia	10 276	12 728	14 695	17 091	19 171	21 074
Bangladesh	54 138	69 178	90 397	115 632	140 767	160 000
Brunei Darussalam	82	130	193	257	333	392
Cambodia	5 433	6 938	6 748	9 690	12 760	14 562
China	645 927	815 951	980 929	1 142 090	1 266 954	1 337 411
Fiji	394	520	634	724	802	844
Hong Kong-China	3 075	3 942	5 039	5 704	6 667	6 982
India	448 314	552 964	692 637	862 162	1 042 590	1 181 412
Indonesia	93 058	116 921	146 582	177 385	205 280	227 345
Japan	93 189	104 448	116 794	123 191	126 706	127 293
Korea, DPR	10 946	14 247	17 239	20 143	22 859	23 819
Korea, Rep.	25 068	31 440	37 459	42 983	46 429	48 152
Lao PDR	2 124	2 692	3 238	4 207	5 403	6 205
Macao-China	173	254	252	372	441	526
Malaysia	8 140	10 853	13 763	18 103	23 274	27 014
Mongolia	959	1 256	1 663	2 216	2 389	2 641
Myanmar	21 075	26 403	33 561	40 844	46 610	49 563
Nepal	9 691	11 893	15 058	19 105	24 432	28 810
New Zealand	2 372	2 820	3 147	3 386	3 868	4 230
Pakistan	48 778	61 750	82 609	115 776	148 132	176 952
Papua New Guinea	2 080	2 554	3 199	4 131	5 388	6 577
Philippines	27 057	36 567	48 112	62 427	77 689	90 348
Singapore	1 634	2 075	2 415	3 016	4 018	4 615
Solomon Islands	118	161	229	314	416	511
Sri Lanka	10 018	12 520	15 060	17 290	18 767	20 061
Thailand	27 642	37 186	47 264	56 673	62 347	67 386
Vietnam	33 648	42 898	53 317	66 247	78 663	87 096
Asia-22	1 570 170	1 962 505	2 410 328	2 905 515	3 363 510	3 688 587
OECD	791 580	894 056	986 839	1 069 779	1 158 133	1 223 591

Source: UNDESA, 2009.

Table A.2. **Share of the population aged 65 and over, 1960 to 2008**

	1960	1970	1980	1990	2000	2008
Australia	8.5	8.3	9.6	11.2	12.5	13.4
Bangladesh	3.2	3.2	3.0	3.0	3.4	3.8
Brunei Darussalam	3.9	3.5	2.9	2.7	2.9	3.3
Cambodia	2.7	2.8	2.8	2.7	3.0	3.4
China	4.8	4.3	4.7	5.5	6.8	7.9
Fiji	2.5	2.4	2.8	3.1	3.5	4.6
Hong Kong-China	2.8	4.0	6.5	8.5	11.0	12.5
India	3.0	3.3	3.6	3.8	4.3	4.8
Indonesia	3.4	3.1	3.5	3.8	4.9	5.9
Japan	5.7	7.0	9.1	12.0	17.2	21.4
Korea, DPR	1.9	1.4	2.5	4.7	7.0	9.4
Korea, Rep.	3.7	3.3	3.9	5.0	7.3	10.4
Lao PDR	2.6	3.0	3.5	3.5	3.6	3.6
Macao-China	5.3	4.6	7.6	6.5	7.4	7.1
Malaysia	3.4	3.4	3.7	3.7	3.9	4.6
Mongolia	3.2	3.0	3.0	4.0	3.4	3.9
Myanmar	3.7	4.1	4.5	4.9	5.4	5.5
Nepal	2.6	2.9	3.1	3.2	3.5	4.0
New Zealand	8.6	8.5	9.8	11.1	11.8	12.5
Pakistan	6.0	5.3	4.5	3.7	3.7	4.0
Papua New Guinea	2.4	2.1	1.9	2.2	2.2	2.4
Philippines	3.0	2.9	3.2	3.2	3.5	4.1
Singapore	2.1	3.4	4.7	5.6	7.2	9.4
Solomon Islands	2.7	3.5	3.3	3.0	2.9	3.1
Sri Lanka	4.7	3.8	4.4	5.5	6.4	7.3
Thailand	3.2	3.4	3.9	4.6	6.3	7.4
Vietnam	4.5	4.9	4.8	4.7	5.6	6.3
Asia-22	3.6	3.7	4.2	4.8	5.8	6.8
OECD	8.6	9.9	11.4	12.1	13.5	14.7

Source: UNDESA, 2009.

Table A.3. **Crude birth rate, per 1 000 population, 1960-65 to 2005-10**

	1960-65	1970-75	1980-85	1990-95	2000-05	2005-10
Australia	22	20	15	15	13	13
Bangladesh	47	47	43	32	25	22
Brunei Darussalam	43	35	30	28	22	20
Cambodia	45	40	52	41	26	25
China	38	29	22	19	14	14
Fiji	42	33	32	28	23	21
Hong Kong-China	33	20	16	12	8	8
India	40	37	34	31	25	23
Indonesia	44	39	32	24	21	19
Japan	17	19	13	10	9	8
Korea, DPR	33	30	22	21	15	14
Korea, Rep.	40	30	20	16	10	9
Lao PDR	43	43	42	40	29	28
Macao-China	32	20	25	17	7	8
Malaysia	43	35	33	28	23	21
Mongolia	43	41	38	29	18	19
Myanmar	42	39	33	25	22	21
Nepal	44	43	41	38	30	26
New Zealand	26	21	16	17	14	14
Pakistan	40	44	42	38	32	30
Papua New Guinea	42	42	38	37	34	32
Philippines	44	39	36	32	26	25
Singapore	34	21	17	18	10	8
Solomon Islands	44	47	40	39	34	31
Sri Lanka	35	29	26	20	19	18
Thailand	43	34	25	19	15	15
Vietnam	46	39	35	29	19	17
Asia-22	40	34	31	26	19	18
OECD	22	19	16	14	12	12

Source: UNDESA, 2009.

Table A.4. **Fertility rate, number of children per women aged 15-49, 1960-65 to 2005-10**

	1960-65	1970-75	1980-85	1990-95	2000-05	2005-10
Australia	3.3	2.5	1.9	1.9	1.8	1.8
Bangladesh	6.9	6.9	5.9	4.0	2.8	2.4
Brunei Darussalam	6.7	5.4	3.8	3.1	2.3	2.1
Cambodia	6.3	5.5	6.6	5.6	3.4	3.0
China	5.6	4.8	2.6	2.0	1.8	1.8
Fiji	6.0	4.2	3.8	3.4	3.0	2.8
Hong Kong-China	5.3	2.9	1.8	1.3	1.0	1.0
India	5.8	5.3	4.5	3.9	3.1	2.8
Indonesia	5.6	5.3	4.1	2.9	2.4	2.2
Japan	2.0	2.1	1.8	1.5	1.3	1.3
Korea, DPR	3.4	3.7	2.9	2.4	1.9	1.9
Korea, Rep.	5.6	4.3	2.2	1.7	1.2	1.2
Lao PDR	6.0	6.0	6.3	5.8	3.9	3.5
Macao-China	5.1	3.2	2.5	1.6	0.8	1.0
Malaysia	6.7	5.2	4.2	3.5	2.9	2.6
Mongolia	6.0	7.3	5.7	3.5	2.1	2.0
Myanmar	6.1	5.9	4.6	3.1	2.5	2.3
Nepal	6.2	6.1	5.8	4.9	3.6	2.9
New Zealand	4.0	2.8	2.0	2.1	2.0	2.0
Pakistan	6.6	7.0	6.6	5.7	4.4	4.0
Papua New Guinea	6.3	6.1	5.5	4.7	4.4	4.1
Philippines	6.9	6.0	5.0	4.1	3.3	3.1
Singapore	4.9	2.6	1.7	1.8	1.4	1.3
Solomon Islands	6.4	7.2	6.4	5.5	4.4	3.9
Sri Lanka	5.2	4.0	3.2	2.5	2.3	2.3
Thailand	6.3	5.1	3.0	2.1	1.8	1.8
Vietnam	7.3	6.7	4.5	3.3	2.3	2.1
Asia-22	5.7	5.1	4.1	3.2	2.4	2.2
OECD	3.2	2.6	2.0	1.8	1.6	1.7

Source: UNDESA, 2009.

Table A5. GDP per capita in 2008 and average annual growth rates, 1980 to 2008

	GDP per capita in USD at PPPs	Average annual growth rate (in real terms)		
	2008	1980-90	1990-2000	2000-2008
Australia	37 701	1.7	2.3	1.5
Bangladesh	1 374	1.2	2.7	3.0
Brunei Darussalam	50 757			-0.4
Cambodia	1 942		2.8	5.9
China	5 870	7.6	9.3	7.4
Fiji	4 367	1.4	3.8	0.6
Hong Kong-China	44 299	4.5	2.3	3.3
India	2 886	3.7	3.5	4.6
Indonesia	3 979	3.4	2.6	3.0
Japan	34 743	3.4	1.0	1.2
Korea, DPR				
Korea, Rep.	26 278	7.5	5.1	3.4
Lao PDR	2 225	2.8	3.7	3.7
Malaysia	14 023	3.1	4.3	2.5
Mongolia	3 505		-1.2	4.5
Myanmar	1 084	-0.7	4.9	6.8
Nepal	1 244	0.5	3.3	1.6
New Zealand	27 172	0.8	1.6	1.5
Pakistan	2 754	3.3	1.5	2.8
Papua New Guinea	2 079	-0.9	1.4	0.3
Philippines	3 575	-0.7	0.8	2.3
Singapore	51 829	4.9	4.6	2.5
Solomon Islands	1 927	-2.0	-0.2	0.1
Sri Lanka	4 393	3.2	3.9	3.1
Thailand	8 401	5.8	3.4	3.4
Vietnam	2 792	3.8	5.8	4.9

Source: International Monetary Fund, World Economic Outlook Database, April 2010

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