Health at a Glance Asia/Pacific 2012

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Health at a Glance: Asia/Pacific 2012

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World Health Organization

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Foreword

Health at a Glance: Asia/Pacific 2012 *presents the latest comparable data and trends on key aspects of health and health systems in selected Asia/Pacific countries and economies. The indicators provide a concise and quantitative overview of health status, determinants of health, health care resources and utilization, and health expenditure and financing in the region.*

This publication has been jointly prepared by the WHO Regional Office for the Western Pacific (WPRO), the WHO Regional Office for South-East Asia (SEARO), the Organisation for Economic Co-operation and Development (OECD), and the OECD/Korea Policy Centre. The WHO regional offices validated data and charts and provided editorial input for the chapter on quality of care.

Countries in the Asia/Pacific region are diverse, and their health issues and health systems often differ. Being able to compare health system performance across countries can provide new ideas, inspire policy makers to consider new approaches, and draw attention to good practices in other countries.

We are particularly delighted to include a chapter on the quality of care in the region. The measurement and improvement of quality of care has become a crucial element of health system governance worldwide, with industrialised and transition countries alike developing new methods and policies. We have some way to go before we can reliably measure the quality of care across a broad range of services, but the first small steps in this publication are significant. We look forward to including more data on the quality of care in subsequent editions.

This report offers a comprehensive and user-friendly framework to inform the monitoring and evaluation of the performance of health care systems, and to promote evidence-based health policy making in the region. We hope you find it useful.

Shin Young-soo
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for the Western Pacific

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Labour and Social Affairs OECD

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Introduction

Health at a Glance: Asia/Pacific presents a set of key indicators on health and health systems for 27 Asia/Pacific countries and economies. 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, health expenditure and financing and health care quality.

This publication was prepared jointly by the WHO Regional Office for the Western Pacific, the WHO Regional Office for South-East Asia, the OECD Health Division and the OECD/Korea Policy Centre, under the co-ordination of Luca Lorenzoni and Michael de Looper from the OECD Health Division.

Chapter 1 and Chapter 2 were prepared by Michael de Looper. Chapter 3 was prepared by Ravi P. Rannan-Eliya, Ruwani Wickramasinghe and Harini Weerasekera (Institute for Health Policy, Sri Lanka), Michael de Looper and Luca Lorenzoni. Chapter 4 was written by Luca Lorenzoni and Hyoung-Sun Jeong (Yonsei University, Korea).

Chapter 5 was prepared by Ian Forde and Nicolaas Sieds Klazinga, with support from Nelly Biondi. Reports on country initiatives in quality of care were prepared by the WHO Bangladesh office, Yoolwon Jeong, Nima Asgari-Jirhandeh, Nora Chea and Ann Katherine Robins (WHO Cambodia office), Liang Binghui (Ministry of Health, China), WHO India office, Yuichi Imanaka (Kyoto University, Japan), Sang-il Lee (Korea University, Seoul), Hasan Abdul Rahman, Maimunah A.Hamid, Noorliza Mohamad Noordin, Samsiah Awang, Nur Ezdiani Mohamed, Siti Haniza Mahmud and Nor'Aishah Abu Bakar (Ministry of Health, Malaysia), Graham Harrison and Chun Paul Soo (WHO Malaysia office), Madeleine de Rosas-Valera, Lilibeth C. David, Rose G. Gonzales (Department of Health, Philippines), Francisco Z. Soria JR. (Philippine Health Insurance Corporation), Eng Kok Lim (Ministry of Health, Singapore) and WHO Sri Lanka office.

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This publication benefited from the comments and suggestions of Henk Bekedam (Director, Health Sector Development, WHO/WPRO), Islam Monir (Director, Health Systems Development, WHO/SEARO), Sanghee Kim (Director General, OECD/Korea Policy Centre) and Mark Pearson (Head of OECD Health Division).

Structure of the publication

Health at a Glance: Asia/Pacific 2012 is divided into five 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, outputs and outcomes 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.
- Chapter 5 on *Health Care Quality* builds on the indicators used in OECD's Health Care Quality Indicator programme to examine trends in health care quality improvement across Asia/Pacific countries and economies. It also provides illustrations of quality of care initiatives in ten countries.

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

Asia/Pacific countries and economies

For this second edition of *Health at a Glance: Asia/Pacific*, 27 regional countries and economies were compared: 22 in Asia (Bangladesh; Brunei Darussalam; 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 Viet Nam) and five in the Pacific region (Australia, Fiji, New Zealand, Papua New Guinea and Solomon Islands).

Selection and presentation of indicators

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 Regional Offices for the Western Pacific and South-East Asia, as well as special country surveys collecting demographic and health information.

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

Australia	AUS	Mongolia	MNG
Bangladesh	BGD	Myanmar	MMR
Brunei Darussalam	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	Viet Nam	VNM
Malaysia	MYS		

Acronyms

AIDS	Acquired immunodeficiency syndrome
ALOS	Average length of stay
AMI	Acute myocardial infarction
ART	Antiretroviral treatment
ASEAN	Association of Southeast Asian Nations
BMI	Body mass index
COPD	Chronic obstructive pulmonary disease
DALY	Disability-adjusted life-year
DHS	Demographic and Health Surveys
DOTS	Directly observed treatment – short course
DTP	Diphtheria-tetanus-pertussis
FAO	Food and Agriculture Organization of the United Nations
GATS	Global Adult Tobacco Survey
GBD	Global burden of disease
GDP	Gross domestic product
GP	General practitioner
HIV	Human immunodeficiency virus
HPV	Human papilloma virus
IARC	International Agency for Research on Cancer
IDF	International Diabetes Federation
IHD	Ischemic heart disease
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Surveys
MMR	Maternal mortality ratio
OECD	Organisation for Economic Co-operation and Development
OTC	Over-the-counter
PPP	Purchasing power parities
SEARO	WHO Regional Office for South-East Asia
SHA	System of Health Accounts
TB	Tuberculosis
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
USD	US dollars
WHO	World Health Organization
WPRO	WHO Regional Office for the Western Pacific

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Chapter 1

Health status

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Life expectancy at birth continues to increase remarkably in Asia/Pacific countries and economies, 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 72.2 years on average in 2010, a gain of more than 15 years since 1970. For comparison, OECD countries gained ten 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 2010 was Japan, with a combined value for men and women of 83.0 years. Hong Kong, Australia, Singapore, New Zealand, the Republic of Korea and Macao, China all exceeded 80 years for total life expectancy. In contrast, numerous countries in the Asia/Pacific region have combined life expectancies of less than 70 years, and in Papua New Guinea, Cambodia, Myanmar and India, a child born in 2010 can expect to live an average of less than 65 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, Viet Nam) 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 1.1.1 and 1.1.3). The gender gap in life expectancy stood at 4.6 years on average across Asian countries in 2010, less than the OECD country average of 5.5 years.

Higher national income (as measured by GDP per capita) is generally associated with higher life expectancy at birth (Figure 1.1.2). There are, however, some notable differences in life expectancy between countries with similar income per capita. Viet Nam and Japan have higher, and Brunei Darussalam and Malaysia lower life expectancies than would be predicted by their GDP 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.

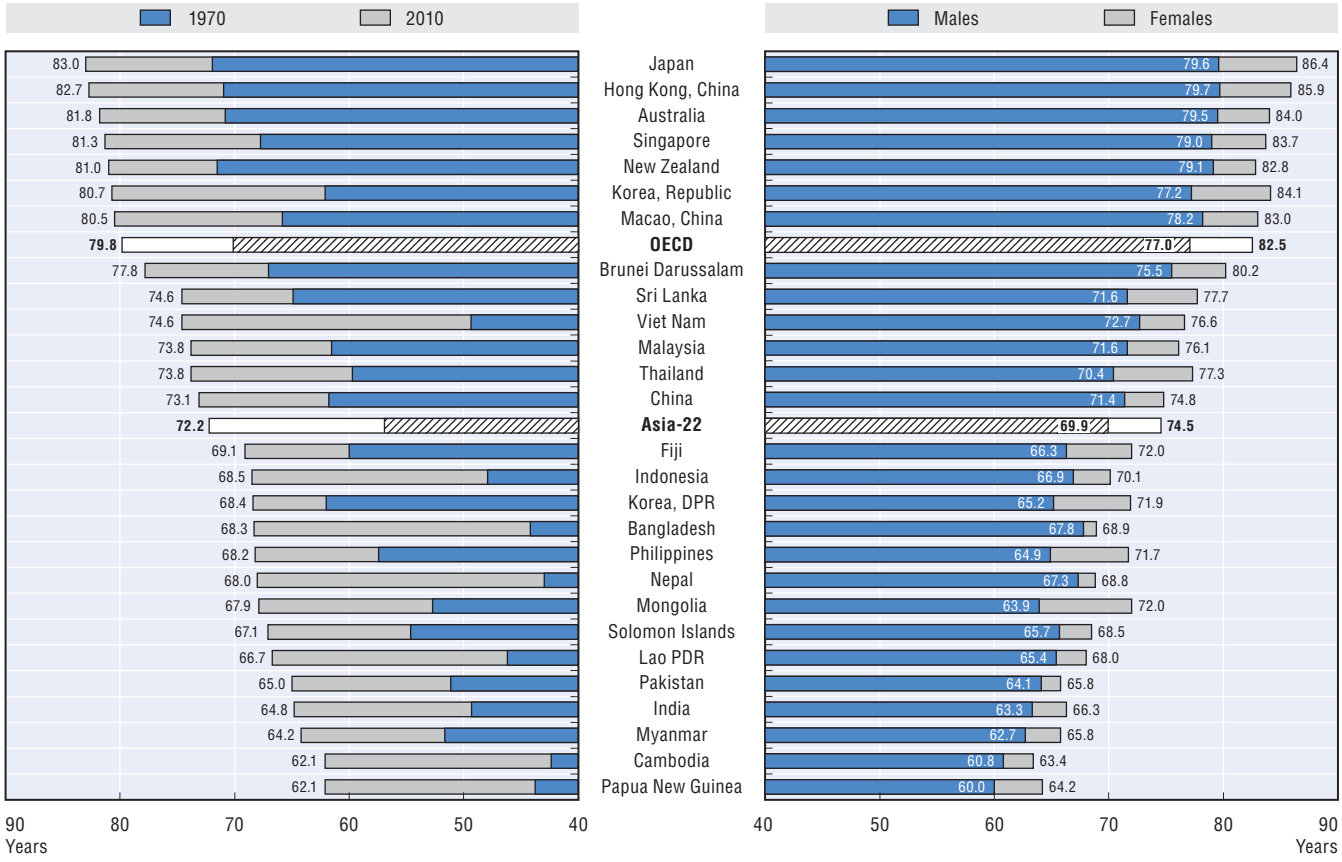
Developing countries continue to struggle to overcome mortality causes that are linked to poorer socio-economic conditions, while post-industrial countries face emerging health threats stemming from rapid environmental and lifestyle changes (UNESCAP, 2005).

Definition and comparability

Life expectancy at birth is the best known measure of population health status, and is often used to gauge a country's health development. It measures how long, on average, a newborn infant can expect to live if current death rates do not change. Since the factors which affect life expectancy often change slowly, variations are best assessed over long periods of time.

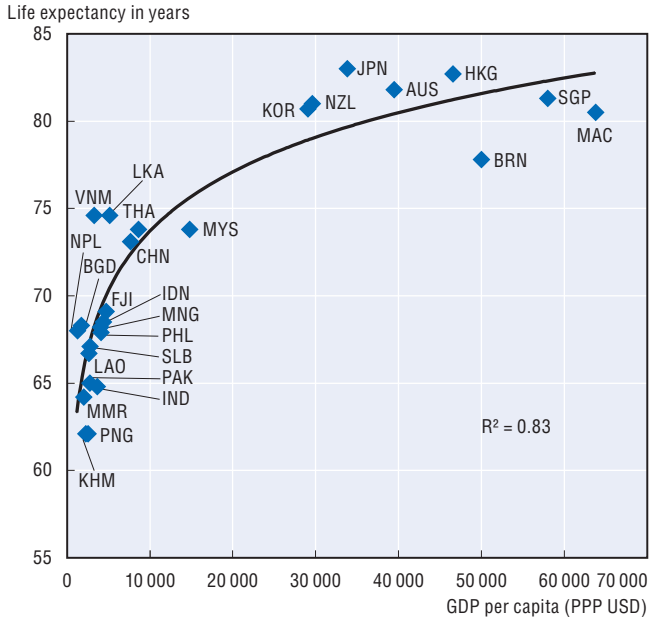
Age-specific mortality rates are required to construct life tables from which life expectancies are derived. The methodologies that countries use to calculate life expectancy can vary somewhat, and these can lead to differences of fractions of a year. Some countries base their life expectancies on estimates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

1.1.1. Life expectancy at birth, 1970 and 2010, and by sex, 2010



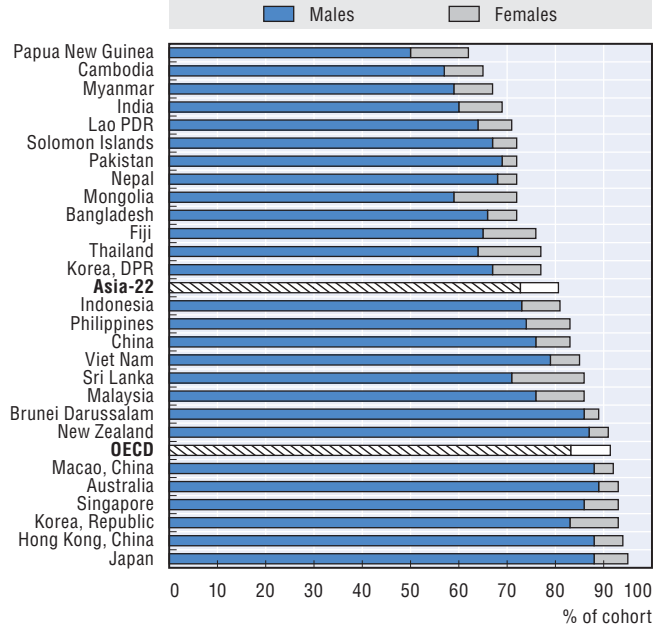
Source: *OECD Health Data 2012*; The World Bank World Development Indicators Online.

1.1.2. Life expectancy at birth and GDP per capita, 2010



Source: *OECD Health Data 2012*; The World Bank World Development Indicators Online.

1.1.3. Survival rate to age 65, 2010



Source: *OECD Health Data 2012*; The World Bank World Development Indicators Online.

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Infant mortality, the rate at which babies and children aged less than one year die, reflects the effect of economic and social conditions on the health of mothers and newborns, as well as the effectiveness of health systems.

Factors such as the health of the mother, 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. 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).

Countries with higher levels of economic development generally have lower infant mortality rates. In 2010, OECD countries averaged four infant deaths per 1 000 live births; among 20 Asian countries, the average was 26 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 2010, whereas rates in Pakistan, Myanmar, India, Papua New Guinea, Cambodia, the Lao PDR and Nepal had rates greater than 40.

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 greater than 50% (Figures 1.2.1 and 1.2.2). In Singapore, the Republic of Korea, Malaysia and Thailand, rates have fallen by three-quarters or more. Falls in DPR Korea, Pakistan, Papua New Guinea and Myanmar have been less pronounced, and this has led to growing gaps between these countries and others in the region.

Inequalities in infant mortality rates also exist within countries (Figure 1.2.3), with the richest population quintile gaining access to key health interventions quicker than the poorest quintile. 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 interventions, such as essential newborn care, breastfeeding, immunisation, 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.

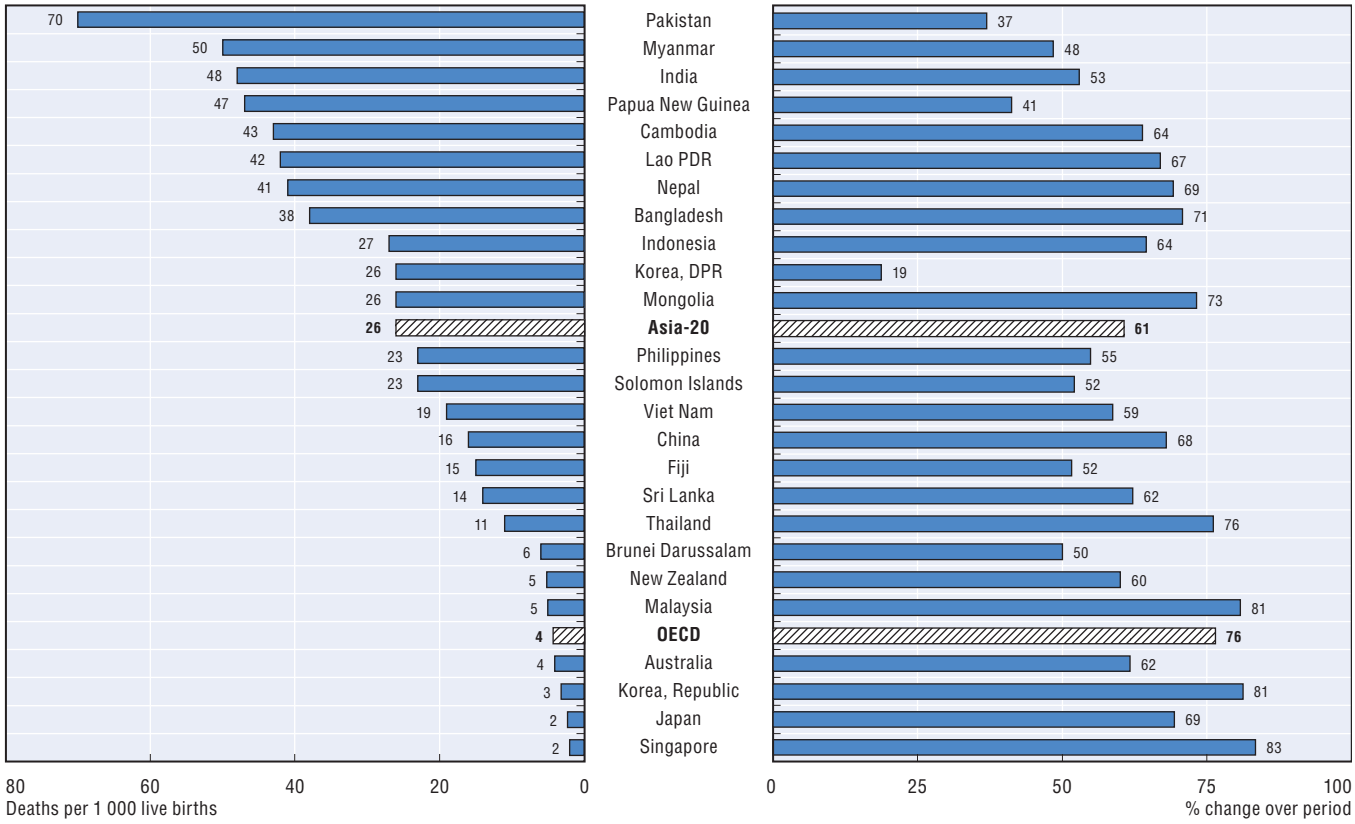
To minimise the avoidable tragedy of infant deaths, renewed efforts are required on a sustainable basis (WHO, 2008a). While it is widely agreed that eradicating poverty is a key factor in reducing mortality rates, debate continues as to whether mortality declines are linked to better nutrition and improvements in preventing premature deaths, or whether more specific government programmes play a central role in changing the health behaviour of individuals (UNICEF, 2008b).

Definition and comparability

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.

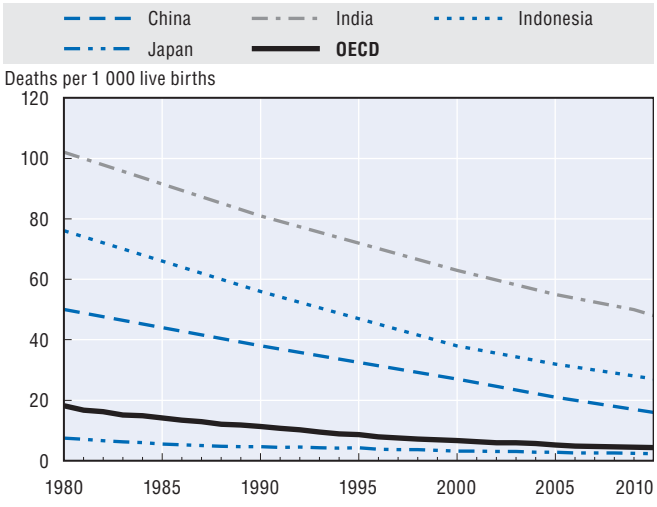
Some countries base their infant mortality rates on estimates derived from censuses and surveys, and not on accurate registration of births and deaths. Differences among countries in registering practices for premature infants may also add slightly to international variations in rates.

1.2.1. Infant mortality rates, 2010 and decline,1980-2010



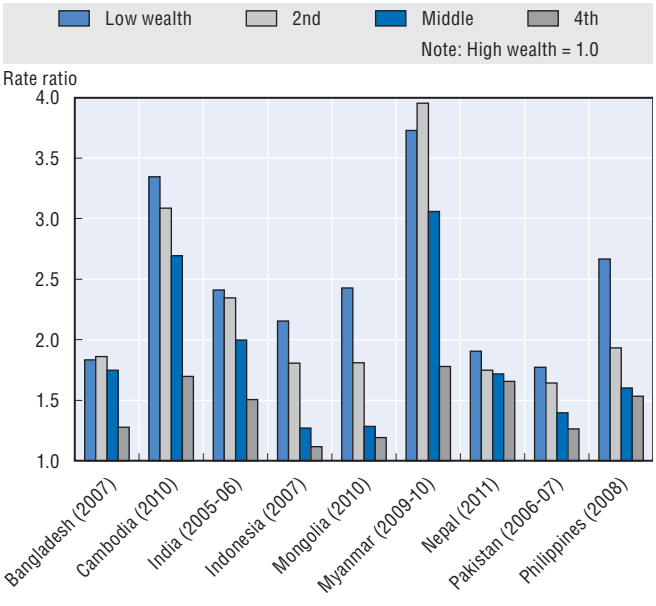
Source: *OECD Health Data 2012*; UNICEF Childinfo.

1.2.2. Infant mortality rates, selected countries, 1980-2010



Source: *OECD Health Data 2012*; UNICEF Childinfo.

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



Source: Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS) 2005-2011.

StatLink http://dx.doi.org/10.1787/888932722867

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 1950-55, 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 the 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, 2012a).

In 2010, 7.6 million children worldwide died before their fifth birthday, and one third of these deaths (2.6 million) occurred in the Asia/Pacific region (Liu *et al.*, 2012). The average under-5 mortality rate across 20 Asian countries was 32 deaths per 1 000 live births (Figure 1.3.1). Singapore, Japan, the Republic of Korea and Australia had achieved very low rates (five or under), these being similar to the average across OECD countries (five deaths per 1 000 live births). Mortality rates in Pakistan, Myanmar, India, Papua New Guinea, the Lao PDR and Cambodia were high, in excess of 50. 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 pneumonia, prematurity, birth asphyxia and congenital anomalies are leading causes of death among children aged under 5 years (Figure 1.3.1). Around one-fifth of all deaths in both Asian and OECD countries are due to pre-term birth complications, with another 16% in Asia from congenital anomalies.

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 32 (Figure 1.3.2). Improvements in China, India and Indonesia are noteworthy, with current rates less than half of 1980 values. However, much of the fall has 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 1 and 4 have limited scope for further improvement, a substantial decline in neonatal deaths will need to occur to meet UN targets for 2015.

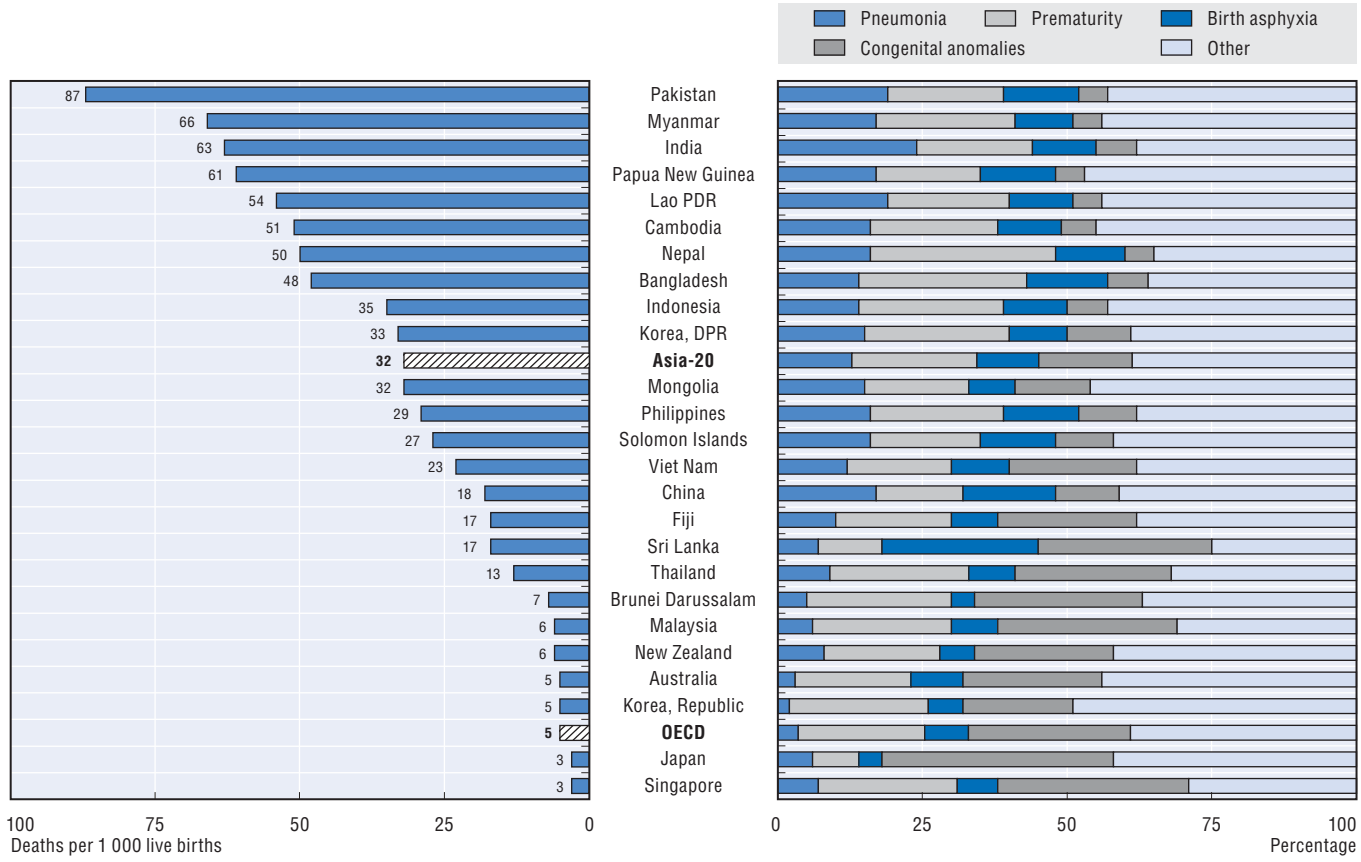
As is the case for infant mortality, inequalities in under-5 mortality rates exist both between and within countries, with good care being less accessible to the needy, whether this is measured by rural-urban regions, by level of wealth or by level of maternal education (Figure 1.3.3). For some countries, 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.

Definition and comparability

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.

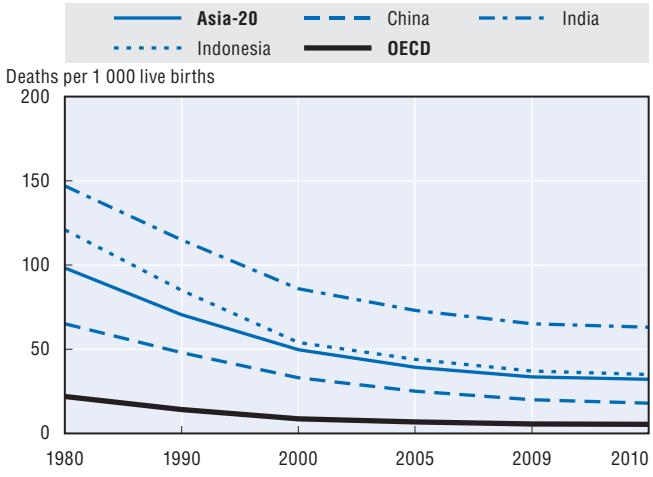
Age-specific mortality rates are required to construct life tables from which under-5 mortality is derived. Some countries base their estimates on censuses and surveys, and not on accurate registration of deaths.

1.3.1. Under-5 mortality rate, and distribution of causes of death, 2010



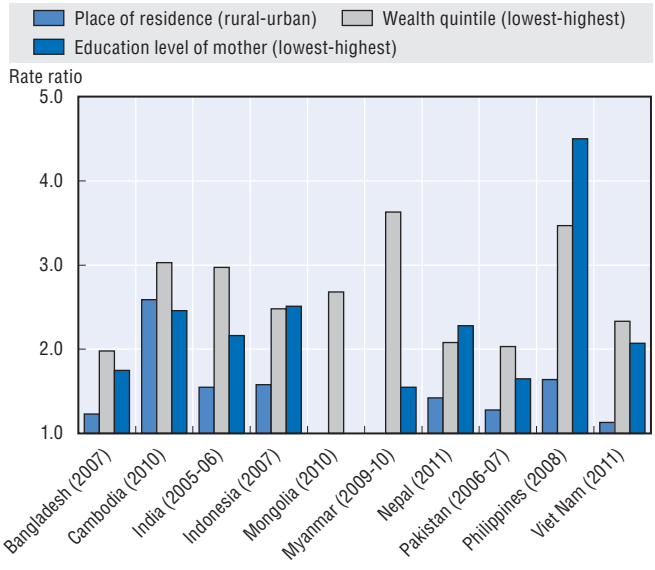
Source: UNICEF Childinfo and WHO (2012f).

1.3.2. Under-5 mortality rate, selected countries, 1980-2010



Source: UNICEF Childinfo.

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



Source: WHO (2012f); Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS) 2006-2011.

StatLink http://dx.doi.org/10.1787/888932722886

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.

Estimates of mortality rates are available for the year 2008 (Figure 1.4.1). Mortality for all causes combined ranged from less than 500 per 100 000 population in Japan, Australia, Singapore, New Zealand and the Republic of Korea, to over 1 000 in Myanmar, Cambodia, the Lao PDR, Papua New Guinea, Pakistan, India, Bangladesh and Nepal. The average rate in 20 Asian countries (902) was around twice that of the OECD.

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"). 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.

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). Injuries are responsible for between 5-10% of all deaths (see Indicator 1.7, "Mortality from injuries").

There are wide disparities in adult mortality in the region. For males in 2009, the mortality rate for those aged between ages 15 and 60 ranged from a low of 76 per 1 000 population in Singapore, to 350 per 1 000 Cambodia (Figure 1.4.3). It also exceeded 300 per 1 000 population in Mongolia, and was less than 100 not only in Singapore, but also in Australia, New Zealand and Japan. Across 20 Asian countries, the average mortality rate for males aged 15-60 in 2009 was 213 per 1 000 population, almost twice the average in OECD countries (114).

Among females, the rate ranged from 42 per 1 000 population in Japan and Singapore to a high of 251 in the Lao PDR. Rates also exceeded 200 in Bangladesh and Papua New Guinea, and were less than 50 in Japan, Singapore, Australia and the Republic of Korea. Across 20 Asian countries, the average mortality rate for females aged 15-60 in 2009 was 132 per 1 000 population, more than twice the average in OECD countries (58).

In a number of countries (Bangladesh, Pakistan, Papua New Guinea, Lao PDR), there is little difference between male and female mortality rates. In Japan, Mongolia and the Republic of Korea, however, male rates are more than twice those of females, and in Sri Lanka, more than three times. Disparities between countries for females were greater than those for males.

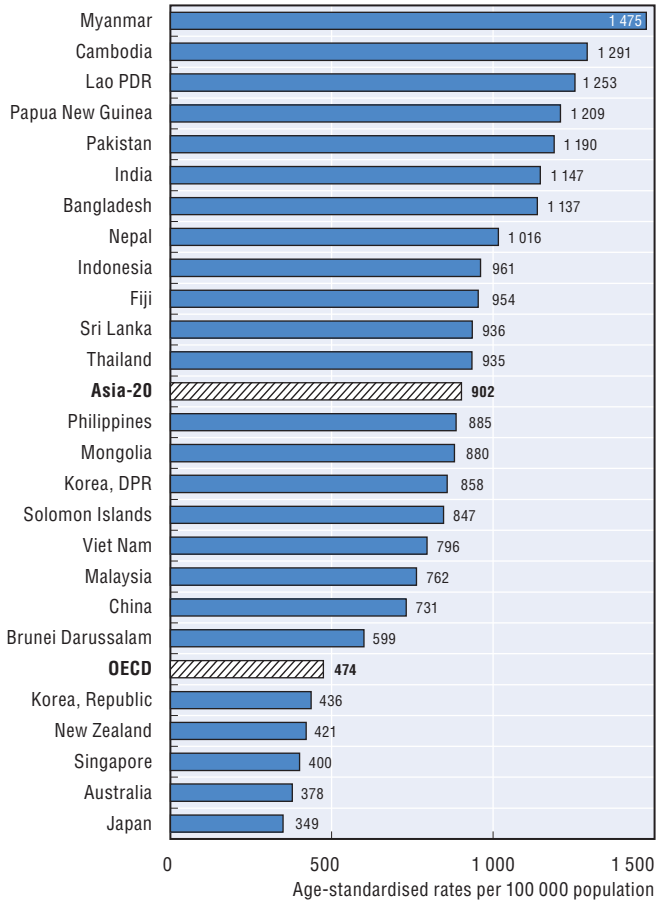
Definition and comparability

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.

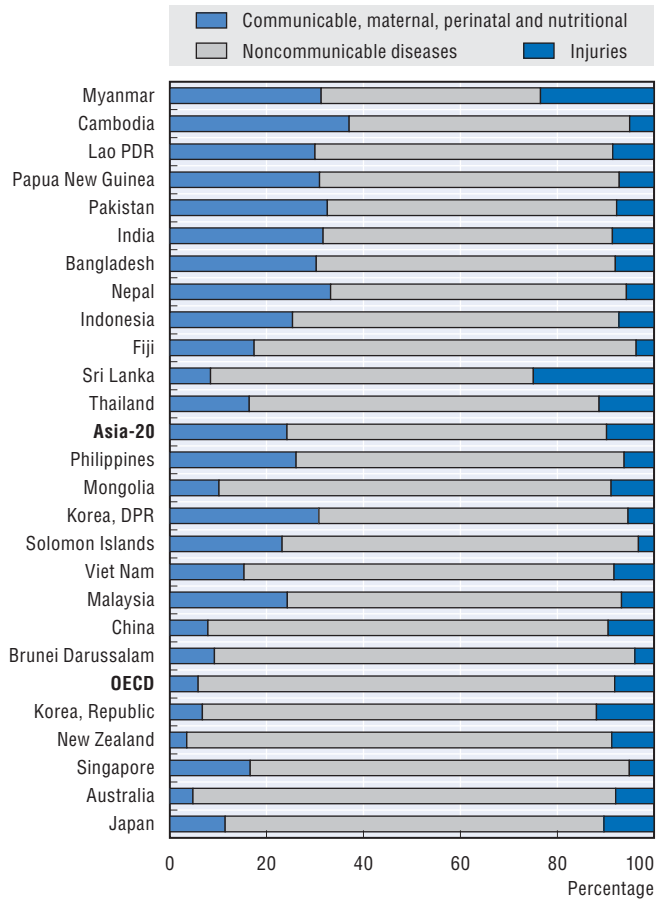
Complete vital registration systems do not exist in many developing countries, and about one-third of countries in the region do not have recent data (WHO, 2008a). Misclassification of causes of death is also an issue. A general assessment of the coverage, completeness and reliability of causes of death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

1.4.1. All causes, estimated mortality rates, 2008

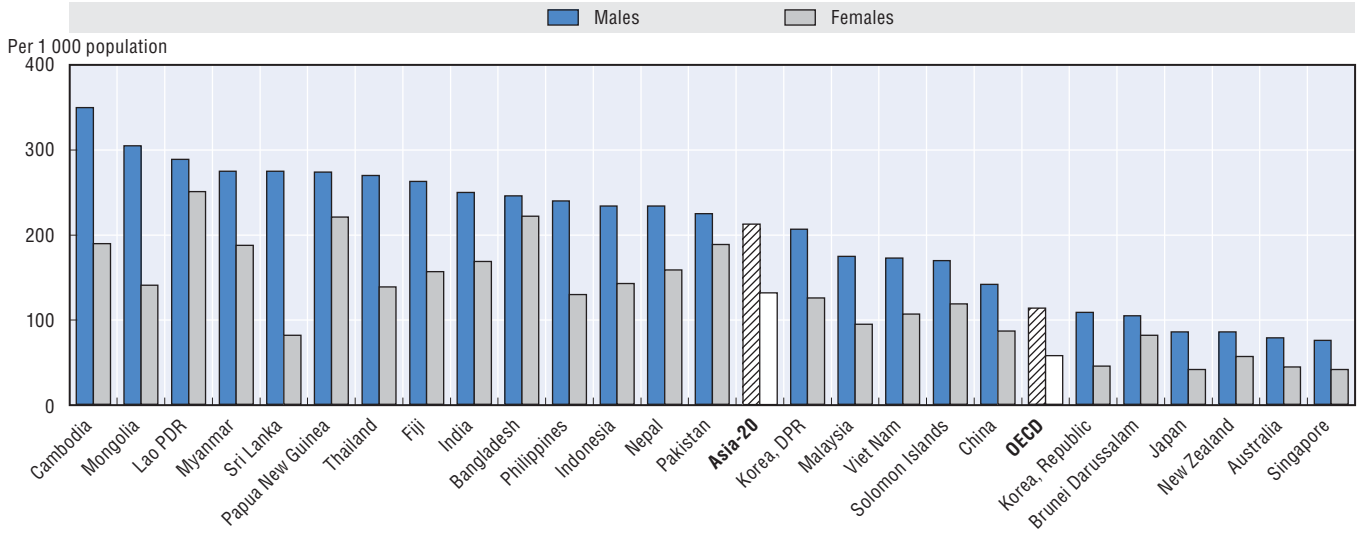


1.4.2. Proportions of all cause deaths, 2008



Source: WHO Global Burden of Disease, 2011.

1.4.3. Adult mortality rate for ages 15 to 60, 2009



Source: WHO (2012f).

StatLink http://dx.doi.org/10.1787/888932722905

Cardiovascular disease has long been the leading cause of death in developed countries. In the Asia/Pacific region it has become increasingly prevalent in recent decades, and now accounts for about one third of all deaths. 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 three quarters of all cardiovascular deaths in the 20 Asian countries included here.

Estimates for the year 2008 indicate high levels of death from cardiovascular disease, exceeding 400 deaths per 100 000 population in Pakistan, the Lao PDR and Fiji (Figure 1.5.1). This is in contrast to a group of developed countries (Japan, Australia, the Republic of Korea, Singapore, New Zealand) where death rates were below 150 per 100 000 population. Mortality rates from cardiovascular disease are, on average, 70% higher in Asian countries than in OECD countries (294 *versus* 170 deaths per 100 000 population).

The types of cardiovascular diseases that are fatal to persons in the region differ across countries. In countries such as China, the Republic of Korea, Mongolia, Viet Nam and Thailand, 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, Pakistan, Bangladesh and Malaysia, 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 most OECD countries, but up to two-thirds of cardiovascular disease can be attributed to hypertension, reinforcing the importance of blood-pressure lowering strategies. High 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 12 grams per day, and in Thailand 11 grams among adults, both higher than WHO's recommendation of 5g or less (Herd *et al*., 2010; WHO, 2011c).

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.

Cardiovascular disease affects younger age-groups in the Asia/Pacific region than in their counterparts in OECD countries. Cardiovascular mortality in India in the 30-59 years age-group is twice than that in the United States. More than half of cardiovascular deaths in India occur below the age of 70 years compared with 23% in established market economies (WHO, 2011c).

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.

Definition and comparability

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).

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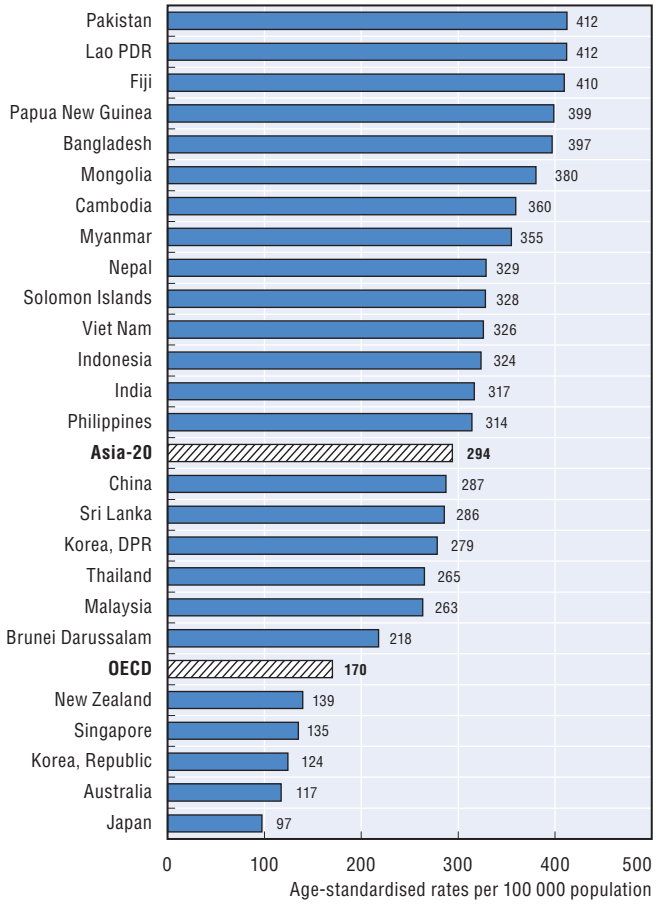
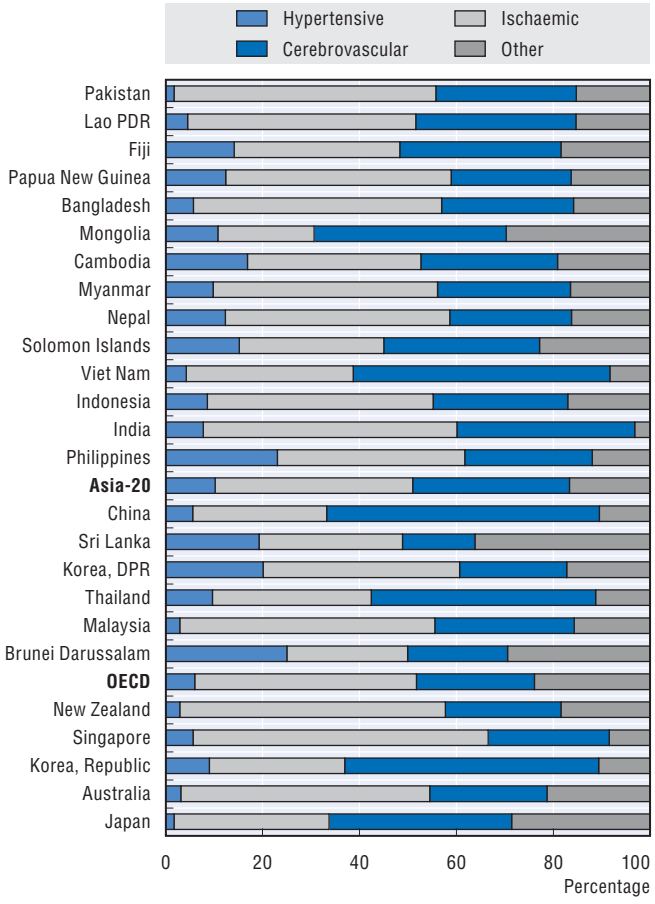
1.5.1. Cardiovascular disease, estimated mortality rates, 2008



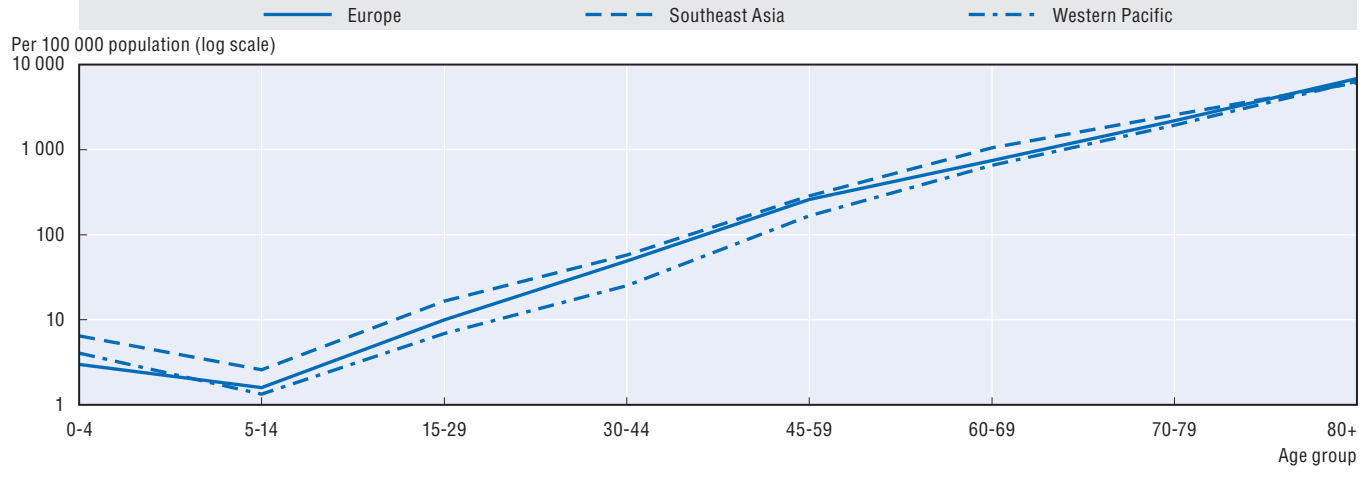
Source: WHO Global Burden of Disease, 2011.

1.5.2. Proportions of cardiovascular disease deaths, 2008



Source: WHO Global Burden of Disease, 2011.

1.5.3. Cardiovascular disease, age-specific mortality rates by region, 2008



Source: WHO Global Burden of Disease, 2011.

StatLink http://dx.doi.org/10.1787/888932722924

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 2008 estimates, include China, New Zealand, Papua New Guinea, the Lao PDR and the Republic of Korea, all with over 125 deaths per 100 000 population (Figure 1.6.1). However, the country with the highest rate was Mongolia, at over 200 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 India, Sri Lanka, the Philippines, the Solomon Islands, Pakistan and Brunei Darussalam, with 100 deaths per 100 000 population or less. The average rate of death in 20 Asian countries was lower than that in OECD countries (114 *versus* 131 deaths per 100 000 population). Cancer also accounts for a much higher proportion of deaths in OECD countries, at 28% in 2009 (OECD, 2011).

There are differences in cancer mortality among countries. Lung cancer remains the main cause of cancer mortality, averaging 19% of all cancers in 20 Asian countries (Figure 1.6.2). Rates are comparatively high in China, DPR Korea, Brunei Darussalam, Singapore and the Republic of Korea. It is anticipated that rates will continue to rise if strong anti-smoking initiatives are not undertaken. Mortality from stomach cancer is also common (13% of all cancer deaths), linked to *Helicobactor pylori* infection, with deaths more prevalent in Mongolia, China and the Republic of Korea.

Besides Mongolia, liver cancer deaths occur more frequently in Lao PDR, Viet Nam, Thailand and China. Incidence is expected to fall in coming decades, with increased immunisation for hepatitis B. Colorectal cancer deaths are higher in New Zealand, Singapore and Indonesia. Breast cancer deaths, the most common cause among women, are responsible for close to 10% of all cancer deaths in Pakistan, Brunei Darussalam, Sri Lanka and Indonesia. Although early detection and therapy can reduce mortality, these services are inaccessible to large numbers of women, mostly poor or living in rural areas, in the region (WHO, 2008a).

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 45. A large proportion of cancer deaths occur in the economically productive age group, with around half occurring below the age of 60 years. In a five-city study in India, nearly 50% of cancer mortality was reported among those below 55 years of age (WHO, 2011c).

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 5 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.

Definition and comparability

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).

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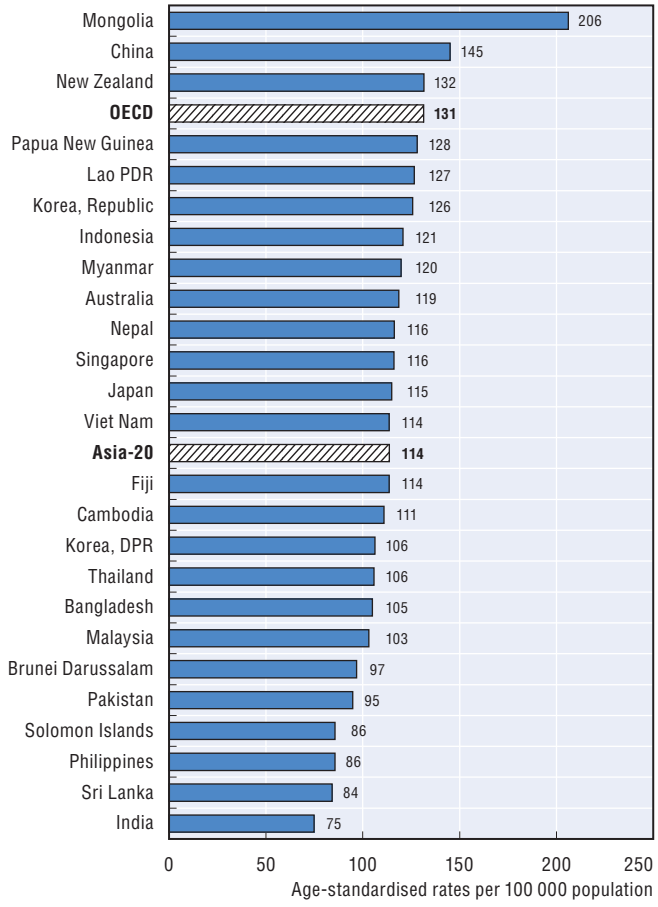
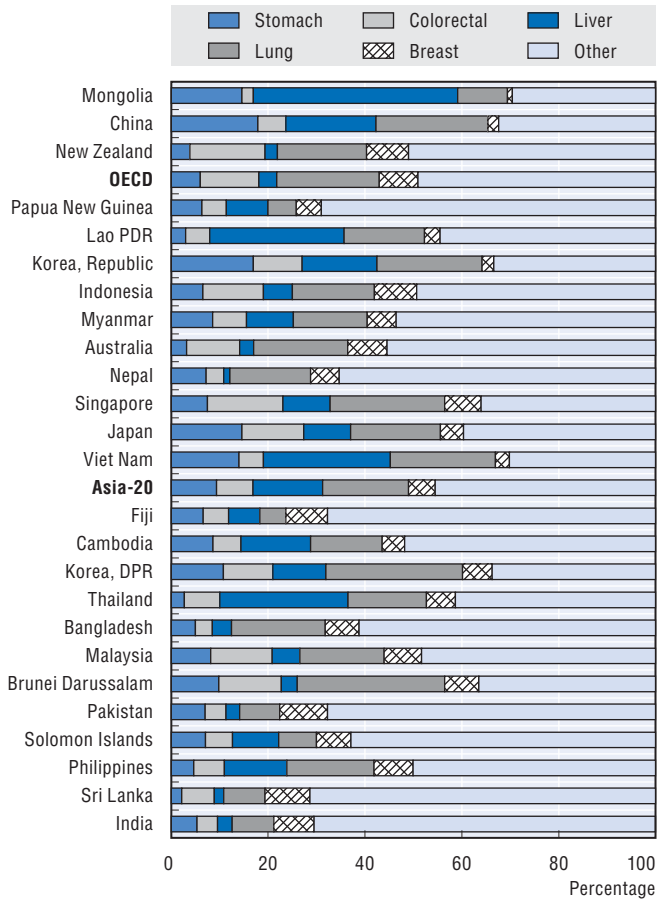
1.6.1. All cancers, estimated mortality rates, 2008



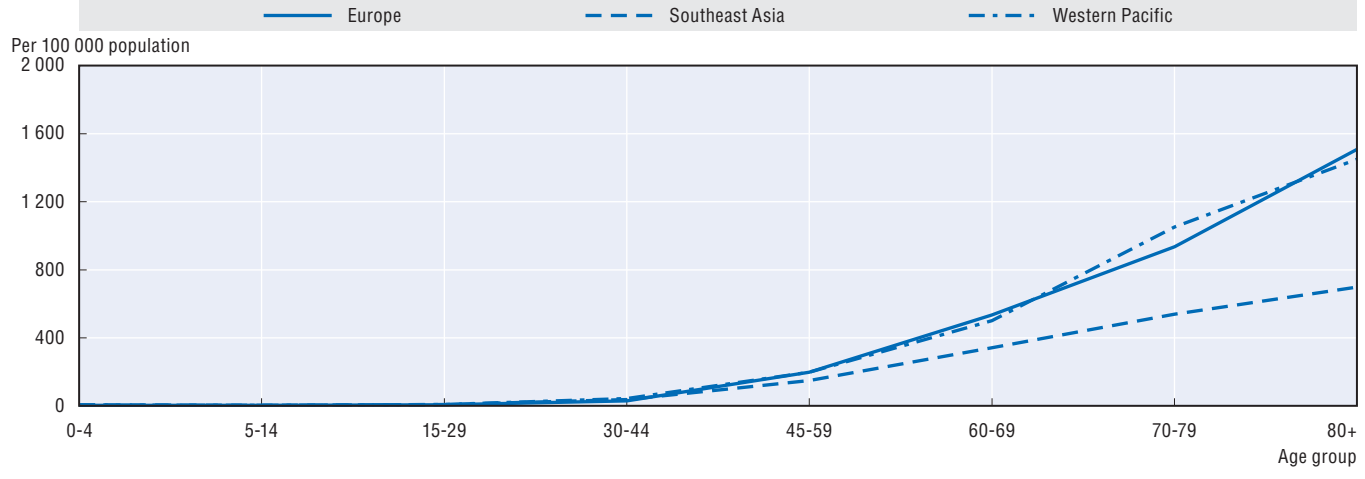
Source: WHO Global Burden of Disease, 2011.

1.6.2. Proportions of cancer deaths, 2008



Source: WHO Global Burden of Disease, 2011.

1.6.3. All cancers, age-specific mortality rates by region, 2008



Source: WHO Global Burden of Disease, 2011.

StatLink http://dx.doi.org/10.1787/888932722943

Injury is a leading cause of death and disability for all age groups, causing around 5 million deaths worldwide each year. Injuries can result from traffic collisions, drowning, poisoning, falls or burns, and violence from assault, self-inflicted acts or war. In the Asia/Pacific region, it is estimated that injuries caused 2.9 million deaths in 2008 (or 10% of total deaths), which constituted more than half 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 88 deaths per 100 000 population in 2008 (Figure 1.7.1). Myanmar had a high mortality rates in this year, although this was largely due to the effects of the catastrophic May 2008 cyclone Nargis, which killed over 140 000 persons. Sri Lanka's high death rate was due to ongoing armed conflict. But even if these countries are excluded, injury mortality in Asian countries averages much higher than in OECD countries. Among a group of largely developed countries, including Singapore, Australia, Japan and New Zealand, injury mortality was lower than 40 deaths per 100 000 population.

The causes of injury deaths differ across countries in the region. In Brunei Darussalam, Malaysia, Mongolia and Thailand, 40% 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. Deaths from interpersonal violence are more common in the Philippines, DPR 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).

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, until the age of 60-69 years (Figure 1.7.3). Mortality rates in the Southeast Asian region tend to be higher than in the other two regions from the age of 45 years onwards.

Injury deaths, both intentional and unintentional, are largely preventable events. A number of 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). WHO's Global Plan for the Decade of Action for Road Safety 2011-20 has been drawn to guide efforts at national and local levels. Injury mortality remains a significant public health problem in the region.

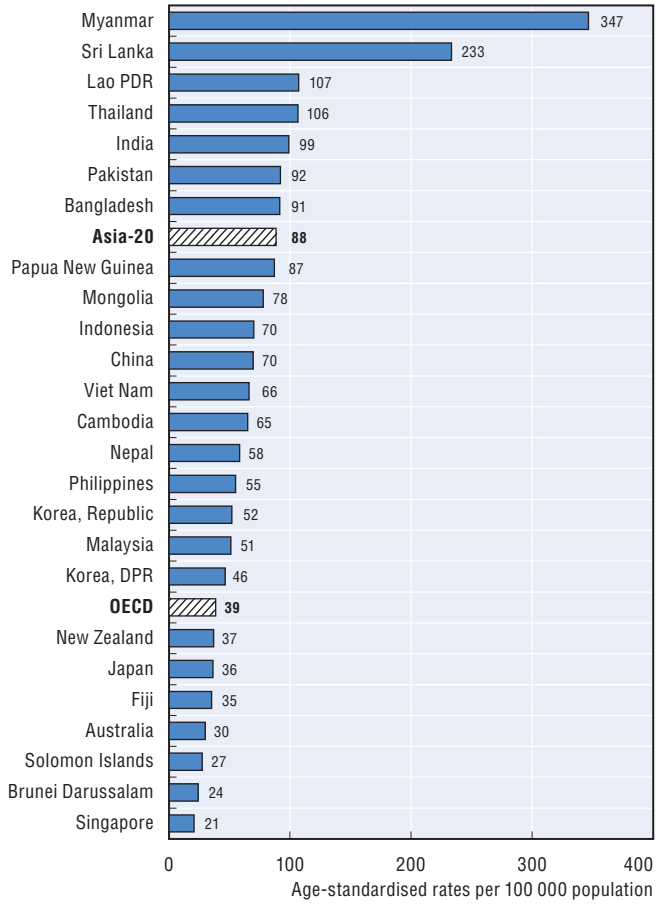
Definition and comparability

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 2008.

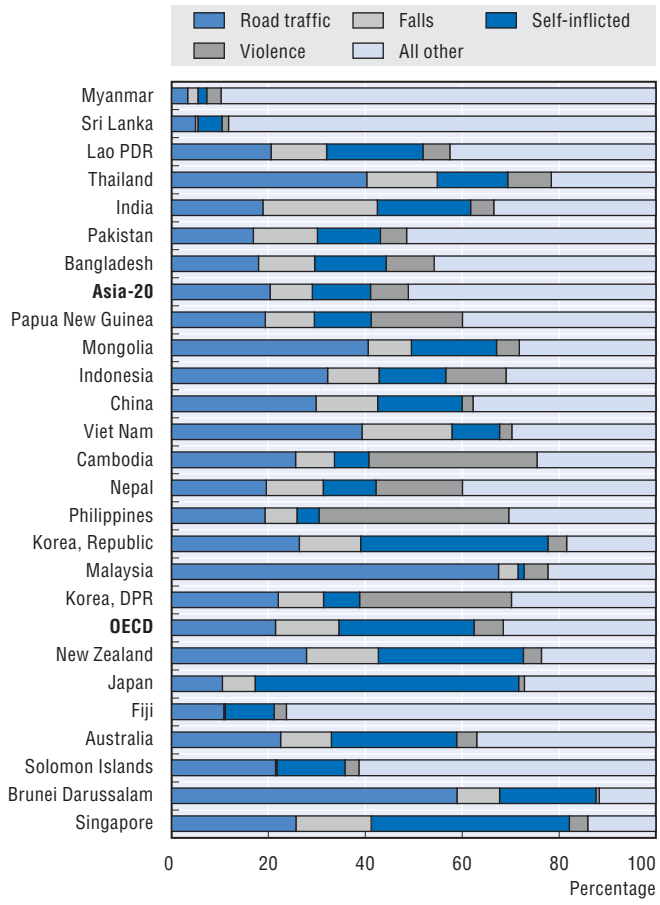
1.7.1. Injuries, estimated mortality rates, 2008



Note: The high rate in Myanmar was due to the catastrophic cyclone of May 2008. In Sri Lanka, armed conflict claimed many lives.

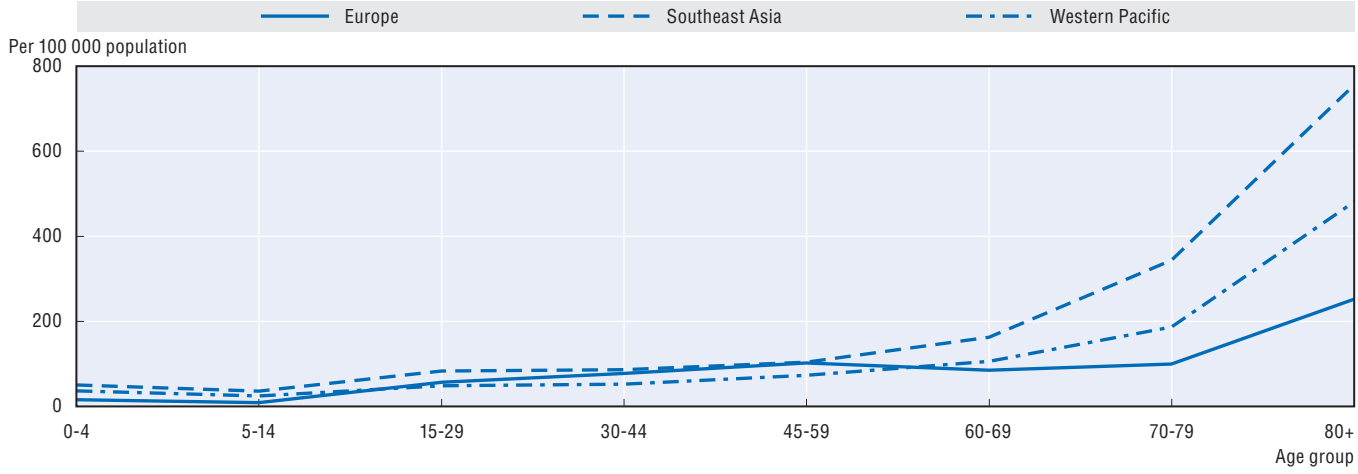
Source: WHO Global Burden of Disease, 2011.

1.7.2. Proportions of injury deaths, 2008



Source: Source: WHO Global Burden of Disease, 2011.

1.7.3. Injuries, age-specific mortality rates by region, 2008



Source: WHO Global Burden of Disease, 2011.

StatLink http://dx.doi.org/10.1787/888932722962

Pregnancy and childbearing offer women opportunities for personal development and fulfilment. But in different countries and to varying extents, it also has 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, rural and urban, with the vast majority of deaths occurring in resource-poor settings, and most being preventable (WHO, 2011b). Fertility and maternal mortality have strong associations with economic development and GDP.

The maternal causes that lead to death result from complications during pregnancy and following birth. Most maternal deaths result either from severe bleeding after childbirth, infections, high blood pressure during pregnancy or unsafe abortion.

Around 800 women die from maternal causes every day. In developed countries, the maternal mortality ratio (MMR) averages around 11 deaths per 100 000 live births; in disadvantaged countries, it is an order of magnitude greater (Figure 1.8.1). Estimates for 2010 show a small group of countries (Singapore, Japan, Australia, New Zealand, Republic of Korea) with very low MMR, and a second group, including Sri Lanka, China, Thailand, Viet Nam and the Philippines, with MMR between 25 and 100 (WHO, 2012a). Another group of countries includes India, Indonesia, Bangladesh and Pakistan, and these have MMR equal to or above 200 deaths per 100 000 live births.

Almost 300 000 maternal deaths were estimated to have occurred worldwide in 2010. More than one quarter of the world's maternal mortality burden (77 000 deaths) occurred in India, Pakistan and Indonesia alone. Large numbers of maternal deaths also occurred in Bangladesh and 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 cut by two-thirds, from an estimated 360 deaths per 100 000 live births in 1990 to 125 in 2010, although this figure is affected by those countries with very high MMR. Nepal, Viet Nam, Lao PDR, Cambodia, Bangladesh and China have all seen significant falls in maternal mortality; in China's case falling by more than two-thirds, from 120 deaths per 100 000 live births in 1990 to 37 in 2010. Thailand and DPR Korea have seen less progress.

Increased fertility presents a greater lifetime risk for women in Asia/Pacific countries. Yet maternal death is not inevitable, and risks can be reduced through family planning, better access to high-quality health care, and greater education and status for women. Although almost all births in countries such as DPR 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 3.5). The lack of social status for girls and women in some countries limits their prospects for education, economic resources and decision making.

Although great headway has been made in the Asia/Pacific region, renewed efforts will need to be undertaken if the WHO Millennium Development Goals of reducing MMR by three-quarters between 1990 and 2015, and achieving universal access to reproductive health by 2015 are to be met.

Definition and comparability

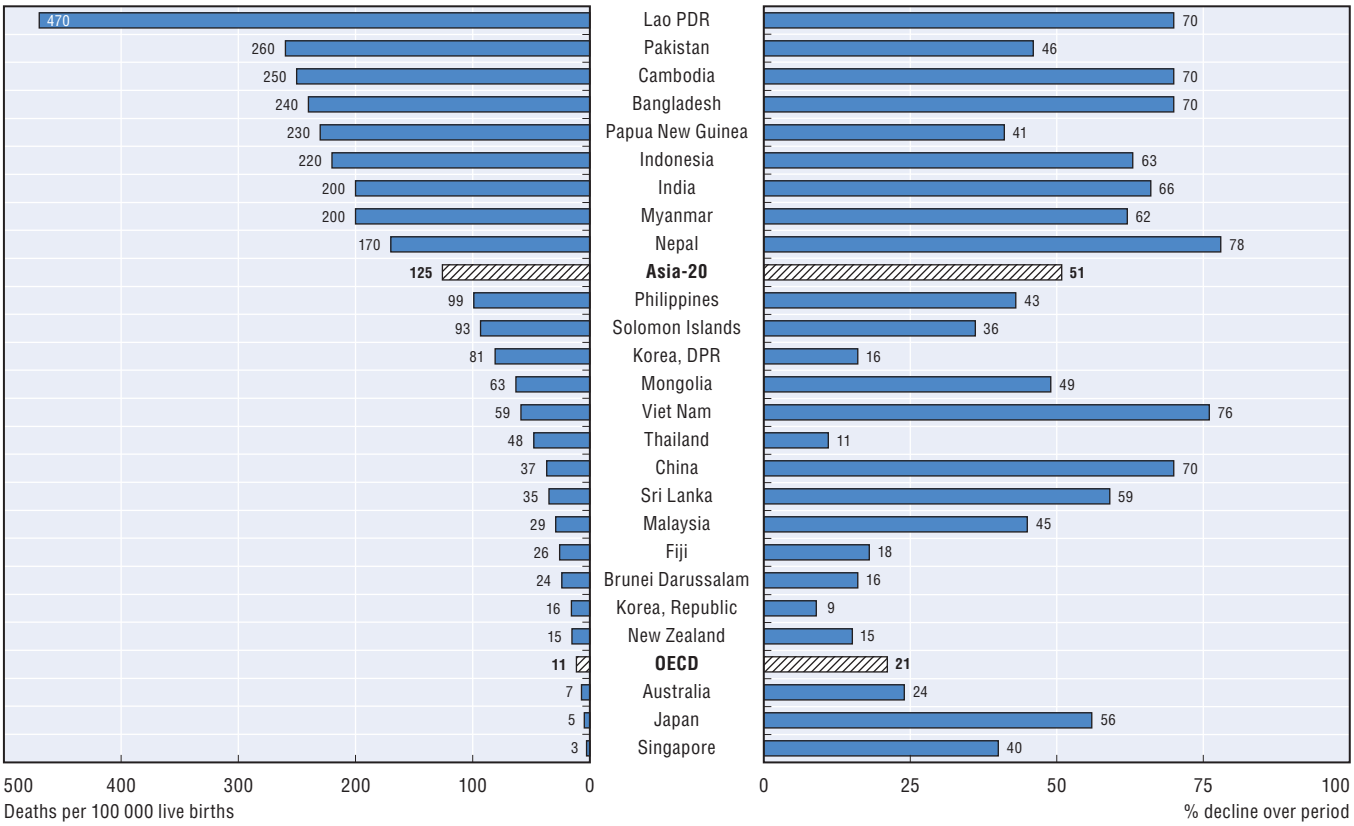
Maternal mortality is defined as the death of a woman while pregnant or during childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes (WHO, 2012a).

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). It is the number of maternal deaths during a given time period per 100 000 live births during the same time period.

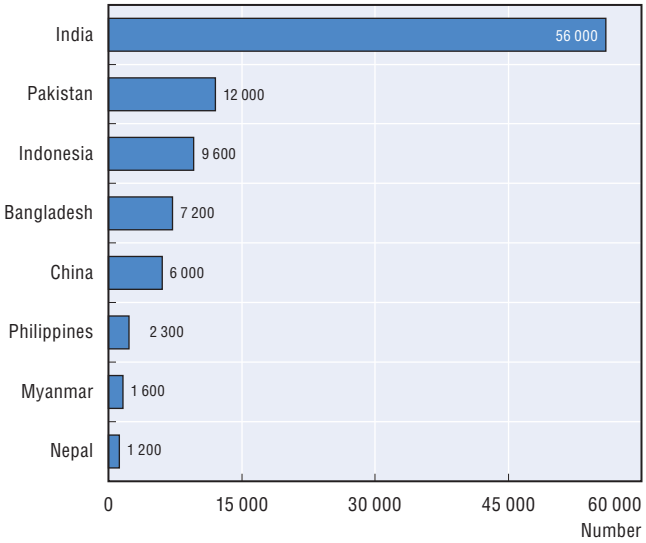
There are difficulties in identifying maternal deaths precisely. Many countries in the region do not have accurate or complete vital registration systems, and so the MMR is derived from other sources including censuses, household surveys, sibling histories, verbal autopsies and statistical studies. Because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

1.8.1. Estimated maternal mortality ratio, 2010, and percentage decline since 1990



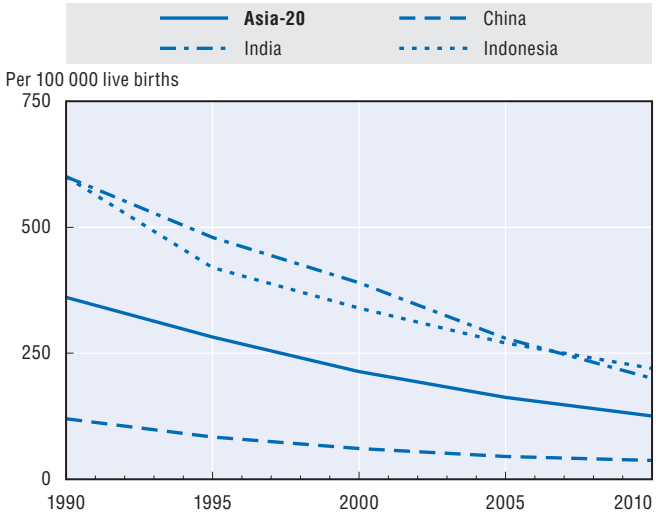
Source: WHO (2012a).

1.8.2. Estimated number of maternal deaths in eight countries, 2010



Source: WHO (2012a).

1.8.3. Estimated maternal mortality ratios, selected countries, 1990-2010



Source: WHO (2012a).

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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 2010, 4.8 million people in the region were living with HIV/AIDS, with about half of these in India. In this year alone, there were 360 000 new infections and 310 000 deaths (WHO, UNAIDS and UNICEF, 2011).

Asia is second only to sub-Saharan Africa as the location with the greatest number of people with HIV. Most of Asia's epidemics occur among sex workers and their clients, men who have sex with men, transgender persons and injecting drug users. In Asia, men who have sex with men 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. In India, about 90% of people newly infected with HIV acquired the disease through unprotected sex.

About 0.1% of the adult population in the Asia/Pacific region had HIV infection in 2009. Prevalence in Pacific countries is generally very low, although Papua New Guinea is an exception at 0.5% of the population (Figure 1.9.1). Thailand is the only Asia/Pacific country where adult HIV prevalence exceeds 0.5%. Cambodia and Myanmar have comparatively high rates, greater than 400 per 100 000 population. This is in contrast to a number of countries where rates are less than one-tenth of that figure – Bangladesh, Japan, the Philippines, Sri Lanka, Mongolia and the Republic of Korea – all at less than 40 per 100 000 population.

Although the prevalence of HIV is low, the absolute number of HIV infections is high, because of Asia's large population. More than 2.3 million people in India were living with HIV in 2009, a number similar to all OECD countries combined (Figure 1.9.1). China (730 000), Thailand (520 000), Indonesia (300 000), Viet Nam and Myanmar (each more than 200 000) face significant disease burdens.

The majority of people in Asia and the Pacific are not aware of their HIV status, and infected persons can remain untreated and transmit HIV unknowingly. It is estimated that fewer than one in three people living with HIV in China has been diagnosed. 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 2010 (WHO, UNAIDS and UNICEF, 2011).

Expanded access to antiretroviral therapy (ART) has increased the survival rates of people living with HIV. Around one third of persons needing ART in Asia receive it, although this figure varies markedly across countries. Among people with advanced HIV infection, less than 20% in Pakistan and Nepal receive treatment (Figure 1.9.2). Cambodia is the only Asian country that has reached the universal access target for antiretroviral therapy, according to WHO guidelines. In India, the country with the greatest disease burden, only one third of people living with advanced HIV infection receive ART. The HIV epidemic continues to outpace the response, with nearly two new HIV infections for every person who starts ART (UNAIDS, 2011).

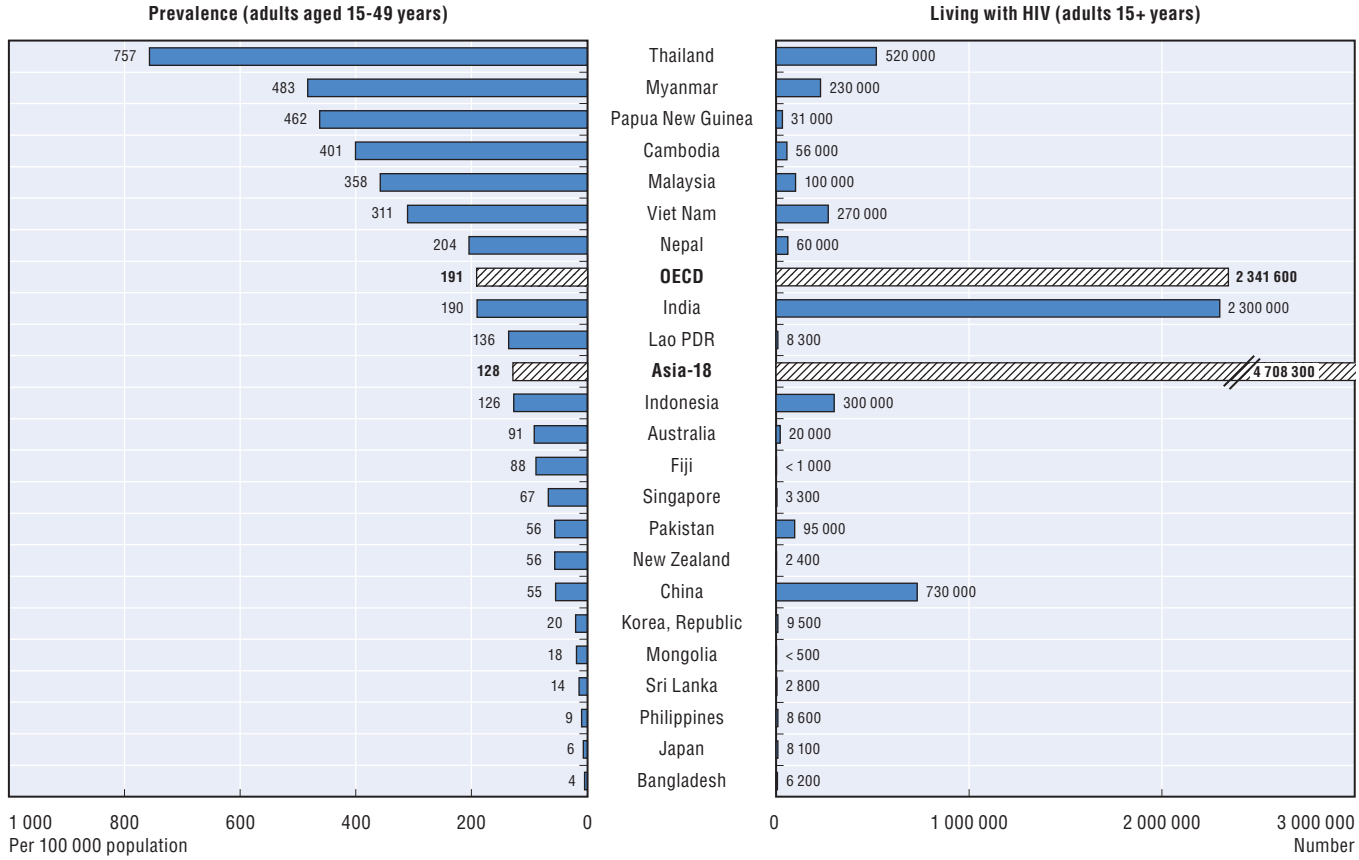
Singapore, Malaysia, Thailand, Pakistan and China fund the bulk of their HIV response from domestic resources. In contrast, the Lao PDR, Viet Nam, Nepal, Myanmar and Papua New Guinea rely heavily on foreign funding, particularly for ART provision (Figure 1.9.3). The USD 1.1 billion spent on AIDS in Asia and the Pacific at the end of 2009 represented around one third of the estimated funding needed to achieve universal access to HIV services (UNAIDS, 2011).

Definition and comparability

Human immunodeficiency virus (HIV) is a retrovirus that destroys or impairs the cells of the immune system. As HIV infection progresses, persons become more susceptible to infections. The most advanced stage of HIV infection is acquired immunodeficiency syndrome (AIDS). It can take 10-15 years for an HIV-infected person to develop AIDS, although antiretroviral drugs can slow down the process.

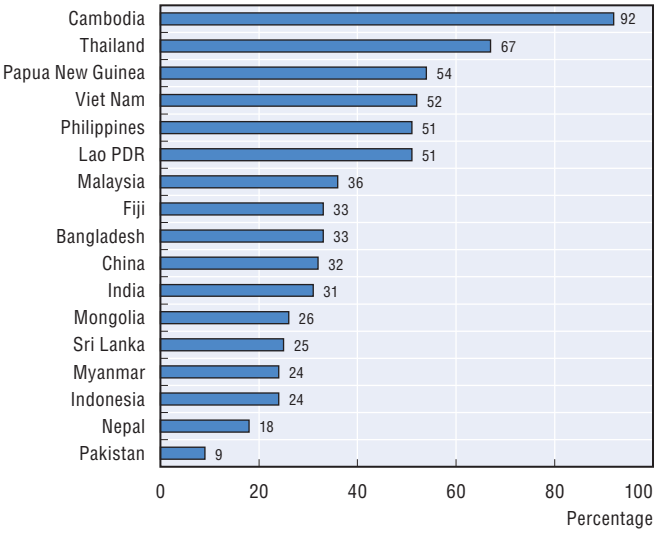
HIV prevalence is the total number of persons aged 15-49 years living with the disease at a particular time, per 100 000 population.

1.9.1. Estimated persons living with HIV, 2009



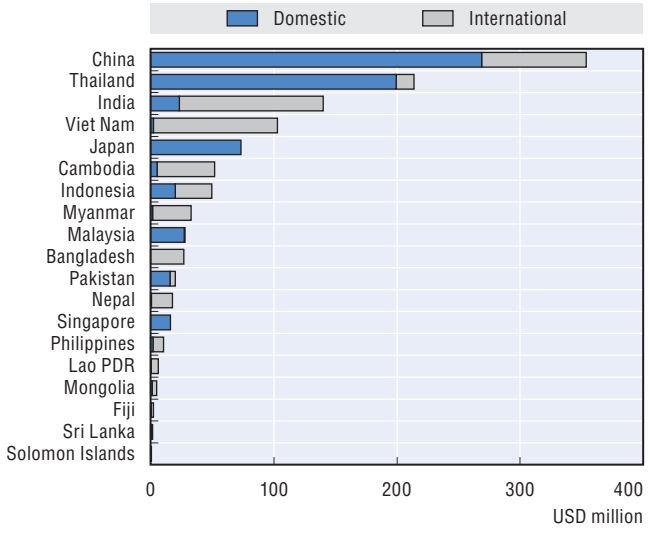
Source: UNAIDS (2010).

1.9.2. Estimated antiretroviral therapy coverage among people with advanced HIV infection, 2010



Source: WHO, UNAIDS and UNICEF (2011).

1.9.3. AIDS spending, by financing source, 2009 or nearest available year



Source: UNAIDS (2010).

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One of the most widespread infectious diseases in Asia and the Pacific is tuberculosis. About 5.2 million new cases occurred in the region in 2010, and tuberculosis claimed the lives of 630 000 people, more than all other infectious diseases combined (WHO, 2011d). In addition, many cases are undetected and untreated. Over 60% of the world's burden of tuberculosis (around 7.5 million prevalent cases) is found in the region.

Incidence rates were highest in Cambodia, Myanmar, DPR Korea and Papua New Guinea, at over 300 new detections per 100 000 population in 2010 (Figure 1.10.1). Incidence rates were also high in the Philippines, Pakistan, Bangladesh and Mongolia. Four of the five countries worldwide with the largest number of incident cases in 2010 were in Asia/Pacific: India (2.3 million), China (1.0 million), Indonesia (0.45 million) and Pakistan (0.40 million).

In 2010, Cambodia and Myanmar were the countries with the greatest TB disease burden, with prevalence rates of 660 and 525 per 100 000 population respectively. The Philippines, Papua New Guinea and Bangladesh also had prevalence rates over 400 per 100 000 population. The average prevalence rate across 22 Asian countries and economies in 2010 was 217, more than ten times that in OECD countries. Australia and New Zealand TB prevalence rates were less than ten.

But in terms of sheer numbers, India and China were the countries with largest number of persons with TB in 2010 (Figure 1.10.1). In India, 3.1 million persons were living with the disease, and in China, 1.5 million. Indonesia, Pakistan and Bangladesh also had half a million or more sufferers. India alone accounted for an estimated one quarter (26%) of all TB cases worldwide, and China and India combined accounted for 38%.

TB is a disease closely related to poverty, with most cases occurring in the productive age-group of 25-54 years, and with males disproportionately affected. It has a huge economic, as well as social impact. In 2006, TB caused India to lose an estimated USD 23.7 billion (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.

The Asia/Pacific region is rising to the challenges presented by TB, with incidence, prevalence and mortality declining steadily since 1990. In Southeast Asia, the prevalence per 100 000 population fell from 457 to 278, and in the Western Pacific from 249 to 139 (Figure 1.10.2). China and Indonesia have seen significant declines, although progress in India has slowed. The WHO-coordinated Stop TB Partnership target is to halve TB prevalence by 2015, compared with a baseline of 1990. The Western Pacific Region is close to doing so, but although reductions in TB prevalence in Southeast Asia appear to have accelerated since 2000, current projections indicate that the target may be out of reach (WHO, 2011d).

DOTS or "directly observed treatment – short course" is the internationally recommended strategy for TB control, and is recognised as being efficient and cost-effective. High-quality TB services have expanded throughout the region, and case detection had exceeded 60% in Southeast Asia and 80% in the Western Pacific by 2010. DOTS treatment success rates have consistently surpassed 85% since 2003 (WHO, 2011d) (Figure 1.10.3).

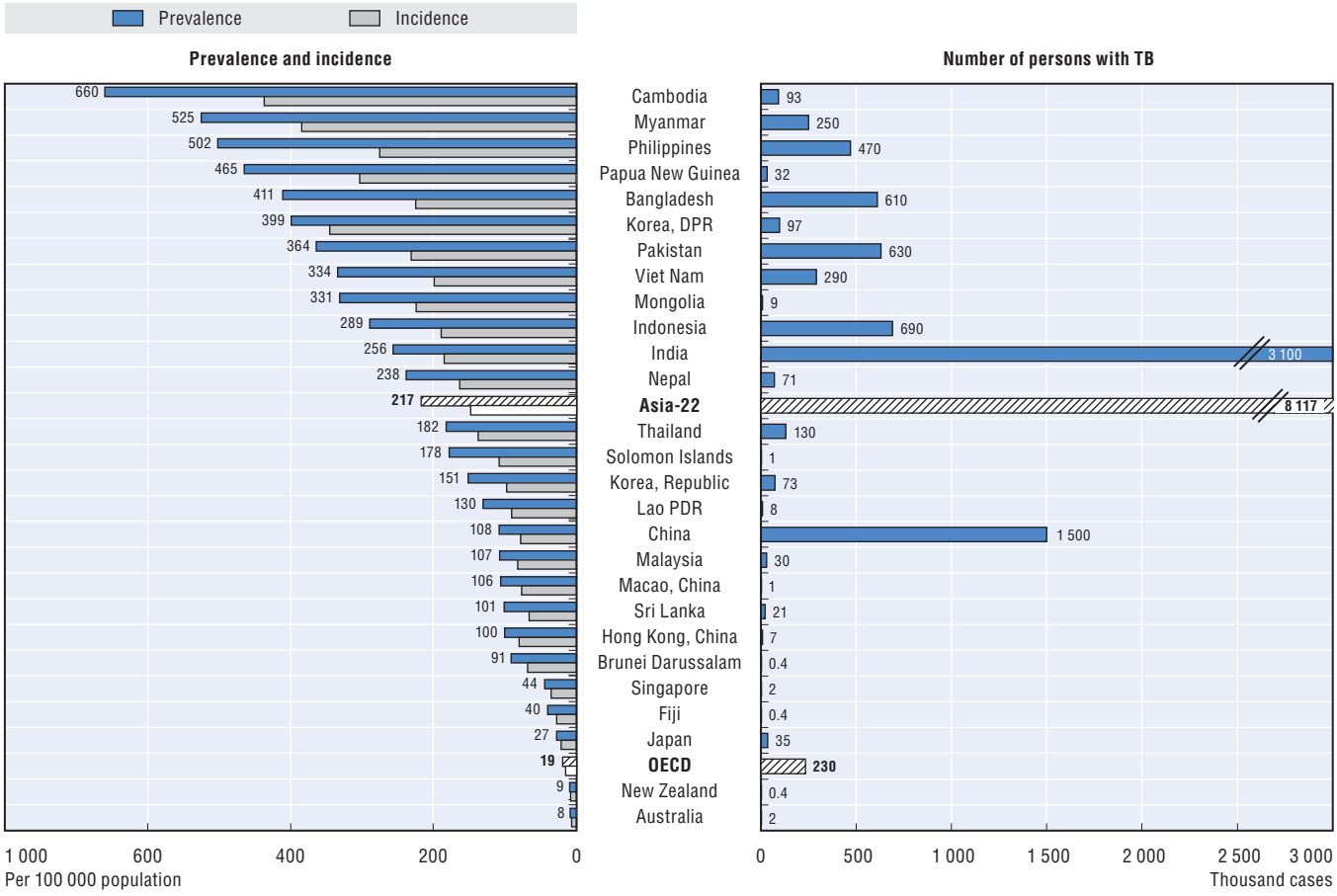
The region faces important challenges to TB control, including providing services to those in greatest need, especially the poor and vulnerable. HIV-TB co-infection, the emergence of drug-resistant strains, funding gaps and the need for greater technical expertise in developing countries all remain threats to progress (WHO, 2011e and 2012b).

Definition and comparability

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.

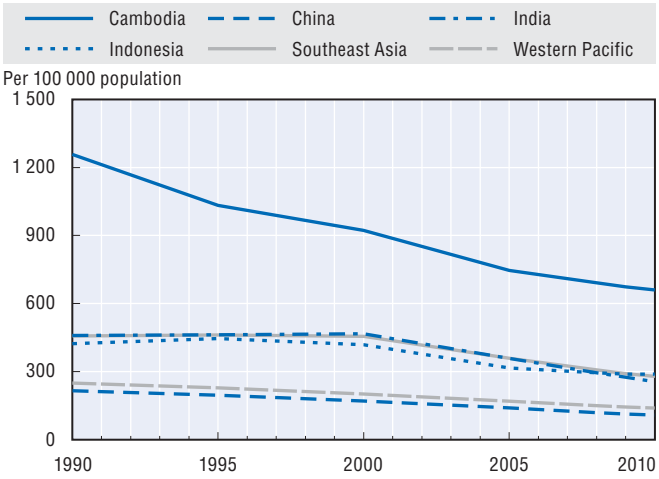
The TB incidence rate is the number of new cases of the disease reported in a year, per 100 000 population. The TB prevalence rate is the total number of persons with the disease at a particular time, per 100 000 population.

1.10.1. Estimate of the burden of disease caused by tuberculosis, 2010



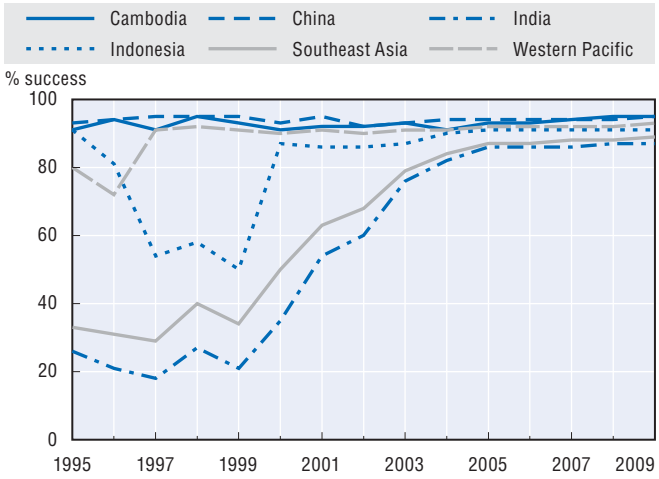
Source: WHO (2011d).

1.10.2. Tuberculosis prevalence rates, selected countries, 1990-2010



Source: WHO (2011d).

1.10.3. Tuberculosis treatment success for new smear-positive cases, 1995-2009



Source: WHO (2011d).

StatLink http://dx.doi.org/10.1787/888932723019

Malaria is a disease transmitted by the bites of infected mosquitoes. In the human body, the *Plasmodium* parasites multiply in the liver, and then infect red blood cells. If left untreated, malaria can become life-threatening by disrupting the blood supply to vital organs.

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.

The disease 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 2010, there were 10 million probable and confirmed cases, but these are a fraction of the suspected number (WHO, 2011f). 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 Pakistan and India, whereas death rates are estimated to be highest in Myanmar, Papua New Guinea and the Solomon Islands. India, Myanmar and Indonesia had high numbers of deaths in 2010.

Although a number of countries in the region such as DPR Korea, Sri Lanka and Thailand have shown a significant reduction in recorded incidence in recent years, the burden appears persistently high in the major endemic centres. This is in part due to better detection rather than an increase in the underlying incidence (WHO, 2010a) (Figure 1.11.2).

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 1.11.3).

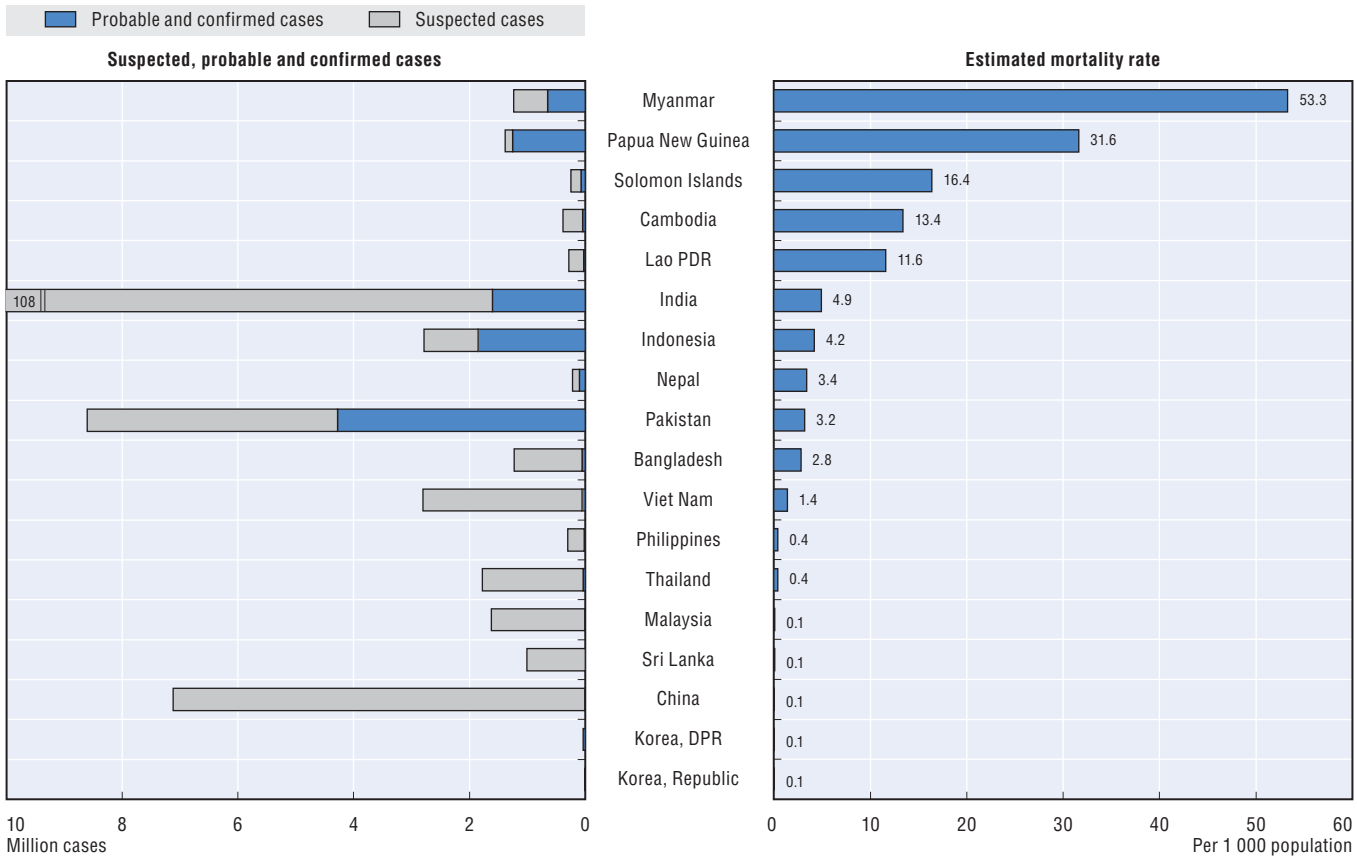
Overall mosquito net coverage exceeds 40% in the Solomon Islands, Malaysia, Sri Lanka and Papua New Guinea. But malaria control efforts are hampered by increased resistance of mosquitoes to insecticides, and uncontrolled population movement leading to more frequent epidemics. The growing problem of multidrug 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.

Definition and comparability

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.

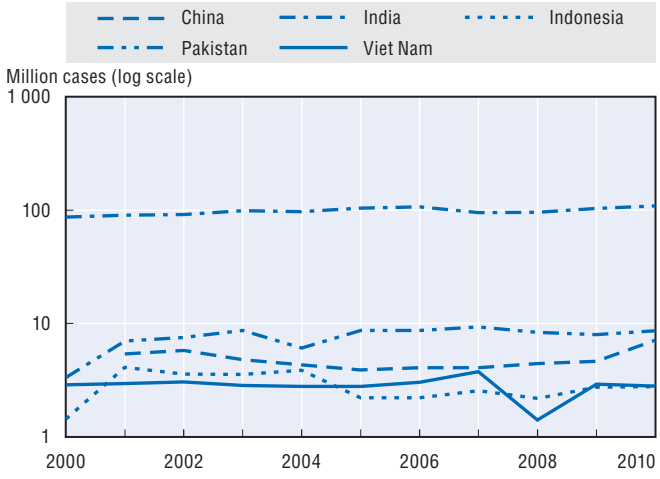
Microscopy or rapid diagnostic tests are recommended to confirm malaria infection in suspected patients. In addition to confirmed cases reported to health authorities, many probable cases occur annually. Underreporting of cases and deaths remain a major challenge in countries with inadequate and limited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

1.11.1. Malaria cases and deaths, 2010



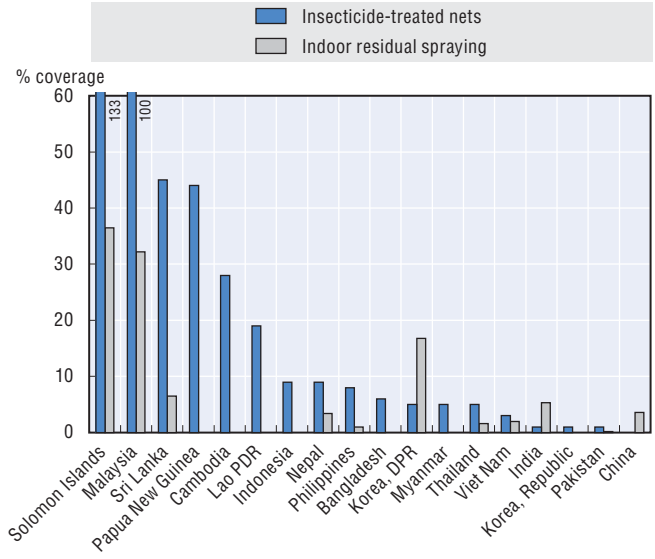
Source: WHO (2011f); Murray *et al.* (2012).

1.11.2. Suspected malaria cases, 2000-10



Source: WHO (2011f).

1.11.3. Estimated coverage of at-risk persons with malaria control interventions, 2010



Source: WHO (2011f).

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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.

Among 22 Asian countries, estimates suggest that over 200 million people, or 7.6% of the adult population had diabetes in 2011 (Figure 1.12.1). Very high prevalence occurs among some Pacific island countries including Kiribati, the Marshall Islands and Nauru, at over 20% of adults. Among the countries included here, the Solomon Islands, Malaysia, Fiji, Bangladesh and the Philippines all have an adult diabetes prevalence of 10% or more. Conversely, less than 5% of the adult population in Cambodia, Viet Nam, the Lao PDR and Nepal have diabetes.

Average diabetes prevalence across Asia/Pacific countries and economies is slightly higher than in OECD countries. There are greater numbers of persons living with diabetes in urban areas, but in all countries undiagnosed diabetes remains a problem. By 2030, there are expected to be well over 300 million persons living with diabetes in the region.

In China, over 90 million people have diabetes, more than in the entire OECD, and in India over 60 million. More than 5 million people have diabetes in Japan, Bangladesh, Indonesia and Pakistan. Of the ten countries worldwide with the largest number of people with diabetes, five are in the Asia/Pacific region.

Type 1 diabetes is one of the most common endocrine and metabolic conditions in childhood (Figure 1.12.2). 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. Because of its large population, some 30% of the world's total of 490 000 children with type 1 diabetes come from Asia/Pacific countries, with almost 100 000 in India alone (IDF, 2011). People with type 1 diabetes need injections of insulin every day to control blood glucose levels.

Around USD 77 billion was spent on diabetes care in Asia/Pacific countries in 2011, with Japan, at USD 35 billion, spending most. China, the country with most people living with diabetes, spent USD 17 billion, and India USD 4 billion. The amount spent per person varied markedly between countries, from more than USD 3 000 in Australia and Japan, to less than USD 30 in Bangladesh, DPR Korea and Myanmar.

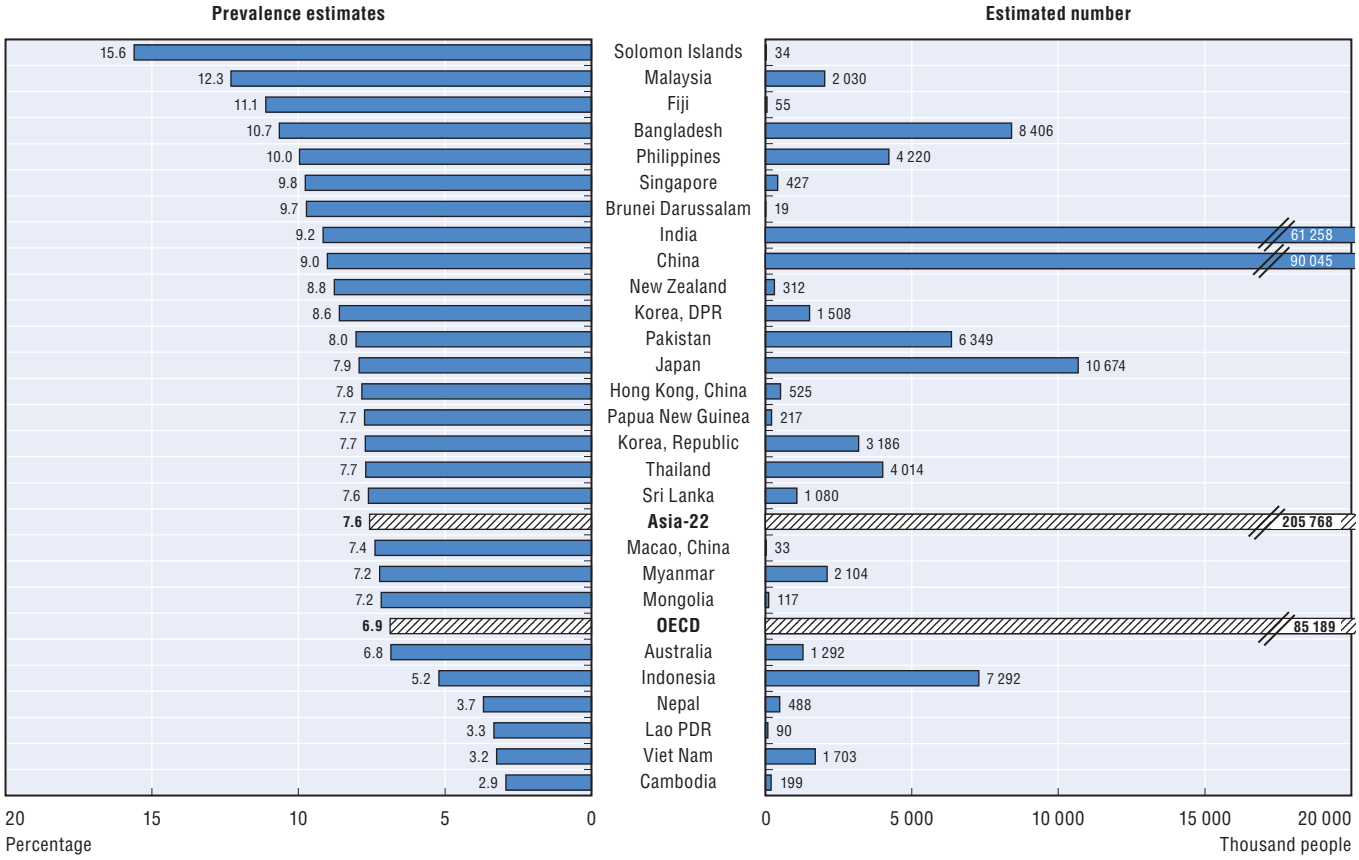
As developing countries undergo epidemiological transitions with rapid changes in lifestyle, diet and overweight, diseases such as diabetes can no longer be considered a disease of the wealthy. Countries with often limited resources must cope with a double burden of infectious diseases and an epidemic 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, 2011).

Definition and comparability

The sources and methods used by the International Diabetes Federation for publishing national prevalence estimates of diabetes are outlined in their *Diabetes Atlas, 5th Edition* (IDF, 2011). Country data were derived from studies published between 1980 and 2011, and were only included if they met several criteria for reliability. Estimates for several countries, including Japan, Korea DPR and Viet Nam were derived from studies in neighbouring countries.

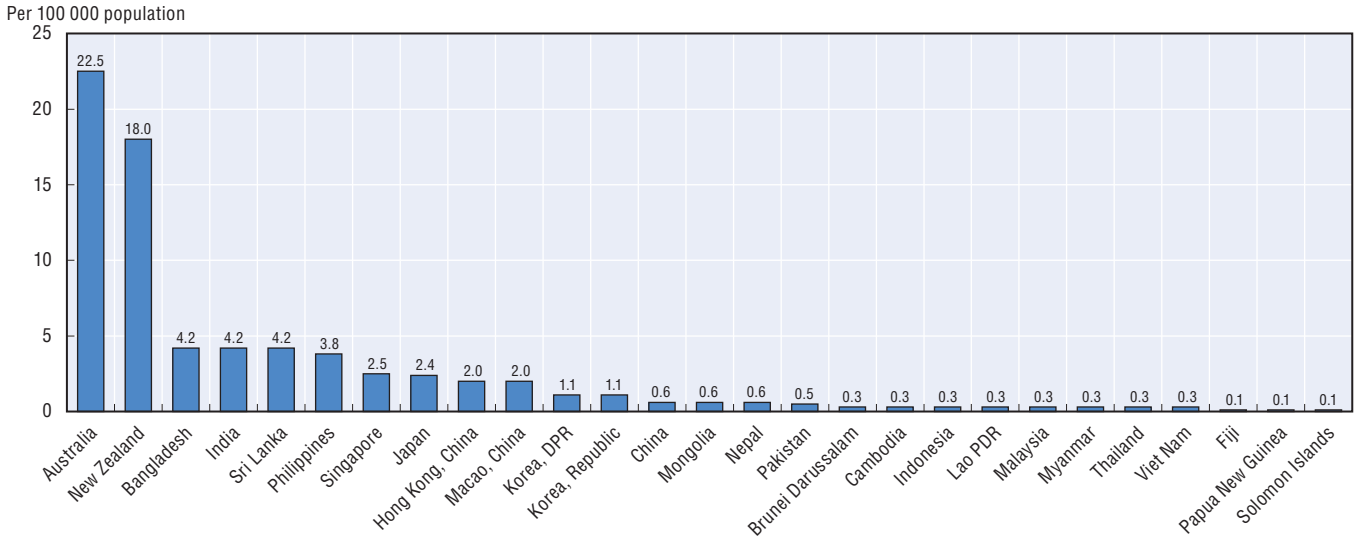
Prevalence rates were adjusted to the World Standard Population to facilitate cross-national comparisons. Data should be interpreted cautiously as general indicators of diabetes frequency.

1.12.1. Diabetes among adults aged 20-79 years, 2011



Source: IDF (2011).

1.12.2. Incidence estimates of Type 1 diabetes, children aged 0-14 years, 2011



Source: IDF (2011).

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Chapter 2

Determinants of health

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Reproductive health involves having a responsible, satisfying 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 Asian region, the leading risk factor for death and disability among women of reproductive age is unsafe sex (WHO, 2009c). 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 countries of the Asia/Pacific region. Among 66 million births in 2010, maternal mortality estimates ranged from three per 100 000 births in Singapore to 470 in the Lao PDR (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; Hong Kong, China and Viet Nam, 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 and economies, only 59% of couples reported using contraceptives, and this included around 9% who use traditional methods such as rhythm, withdrawal and folk methods. In Pakistan, the Solomon Islands, Papua New Guinea, the Lao PDR, Myanmar and Malaysia, less than half of couples report using any method of contraception.

Countries with lower contraceptive prevalence report higher rates of unmet need for family planning (Figure 2.1.1). In the Lao PDR, Pakistan, Nepal and Cambodia, 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 Viet Nam, countries where contraceptive use was most prevalent.

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 poorest wealth quintile. Other countries such as Bangladesh, Indonesia, Mongolia, Thailand and Viet Nam, however, indicate a relatively equal use of contraceptives by women, regardless of wealth.

Around 27 million unwanted pregnancies were terminated in the Asia/Pacific region in 2008 (Sedgh *et al.*, 2012; WHO, 2011g). Of these, it was estimated that 11 million (or 40%) were unsafe, occurring outside national legal systems. About 12% of all maternal deaths in the region are due to unsafe abortions (WHO, 2011g). Alarmingly, high rates of unsafe abortion occur in South-central and South-East 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.

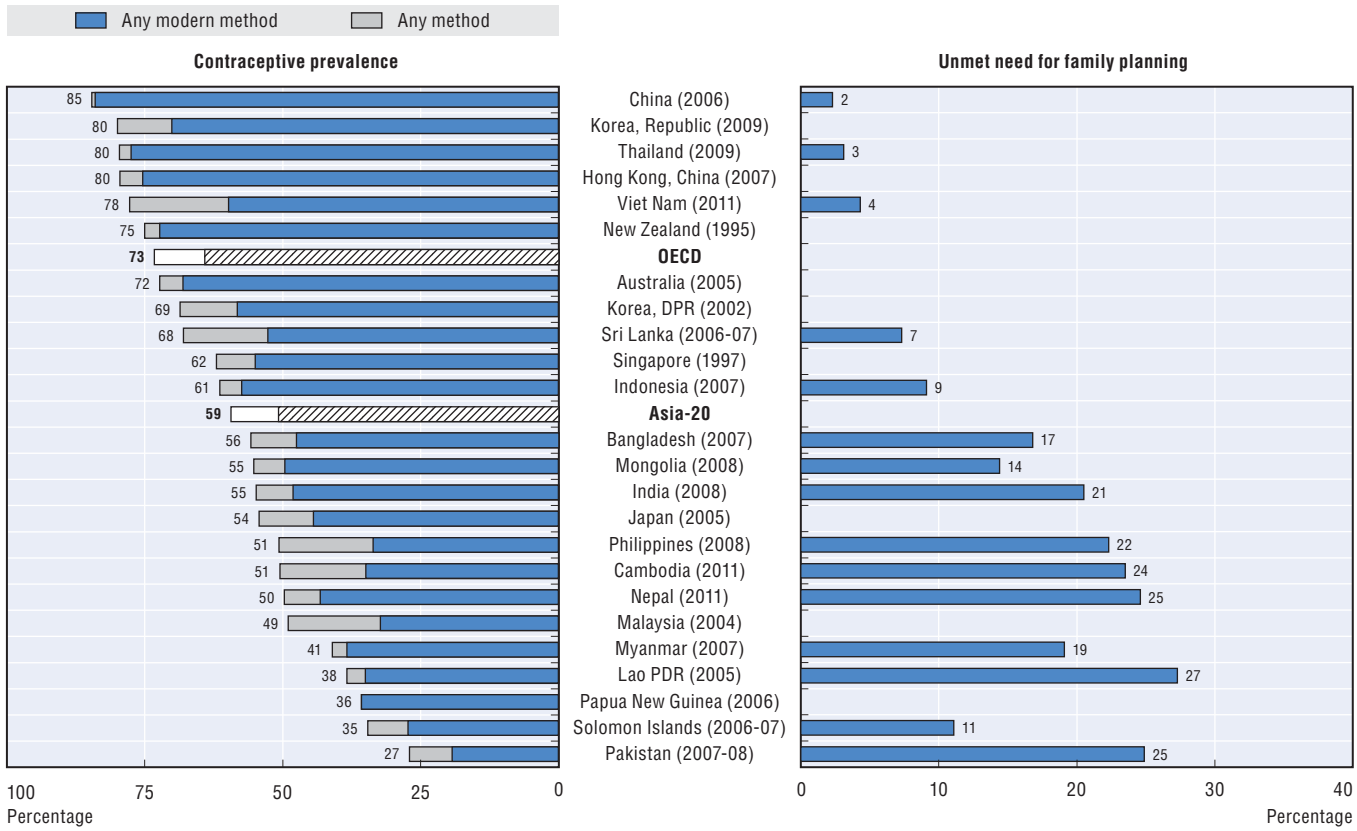
Definition and comparability

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.

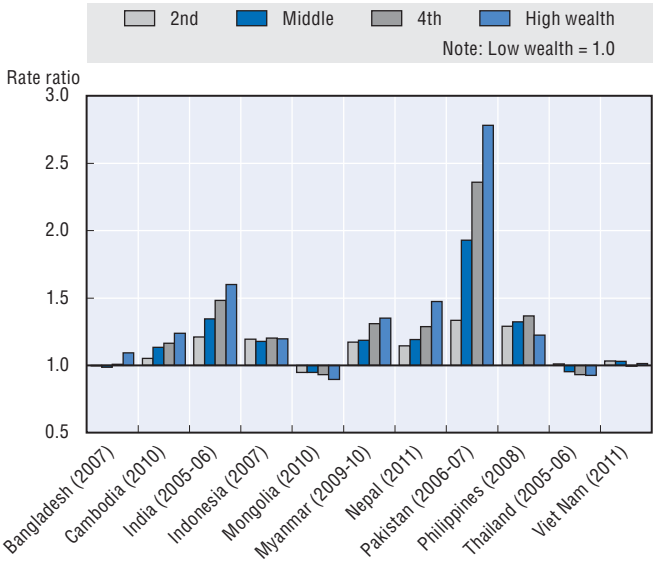
Information on contraceptive use and unmet need for family planning is generally collected through nationally representative household surveys. Estimates of safe and unsafe abortion are derived from administrative and hospital data, as well as from national and household surveys. Survey years and age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

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



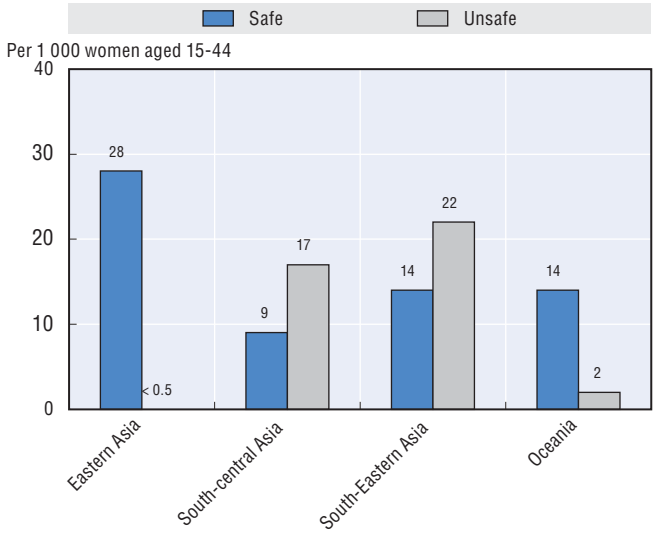
Source: United Nations (2012b).

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



Source: Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS) 2006-2011.

2.1.3. Estimated rate of safe and unsafe abortions, by region, 2008



Source: WHO (2011g).

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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 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 18 Asian countries, an average of 13.0% of births (about one in seven) were low birthweight. This is nearly double the OECD average of 6.7% (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 7 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, 2012). Both India and Indonesia show little change (Figures 2.2.1 and 2.2.2). Large reported declines in Viet Nam, Myanmar 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 2.7% in 2008, well below the OECD average, although China's large population size means that the number of children who are affected is high, with an estimated 1 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 2010. 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.

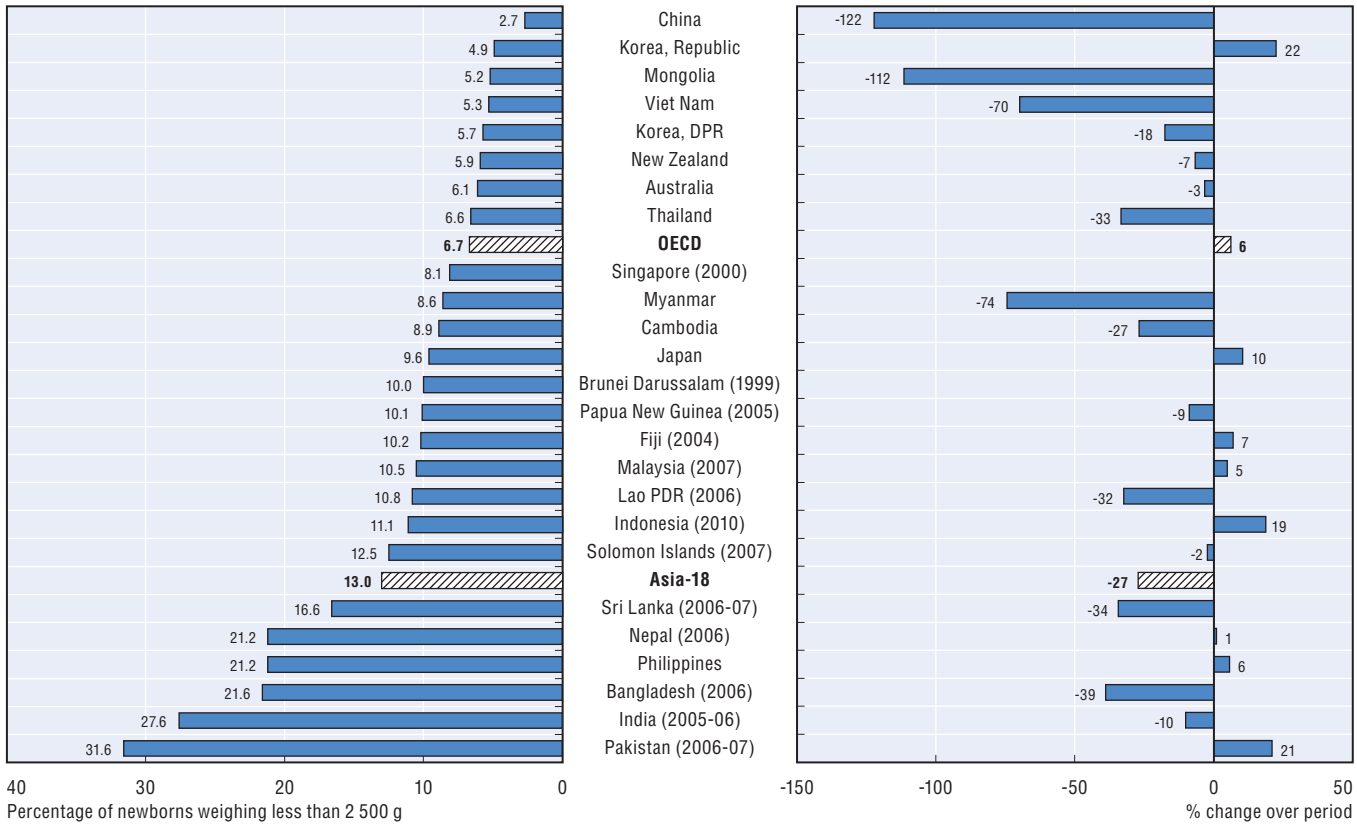
Low birthweight is an important indicator of infant health because of the close relationship between birthweight and later morbidity and mortality. It is an underlying factor in 60-80% of neonatal deaths, with low birthweight babies 20 times more likely to die in infancy. Countries reporting a higher incidence of low birthweight report greater infant mortality (Figure 2.2.3).

Definition and comparability

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.

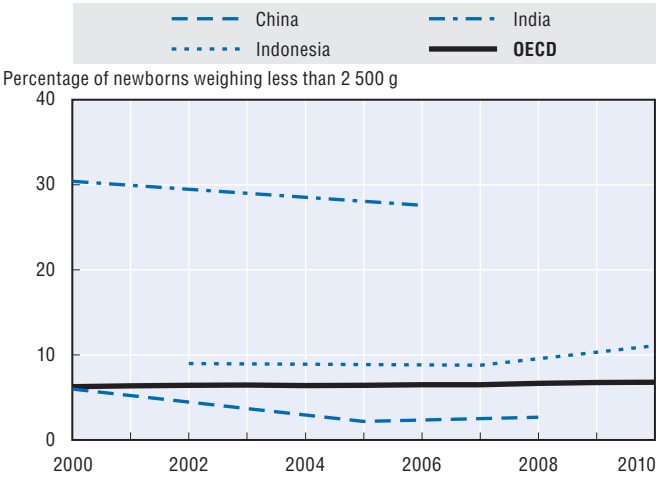
In developed countries, the main information sources are national birth registers. For developing countries, low birthweight estimates are primarily derived from mothers participating in national household surveys, as well as routine reporting systems (UNICEF and WHO, 2004).

2.2.1. Low birth weight infants, 2008-09 (or nearest year available) and percentage change, 2000-01 to 2008-09



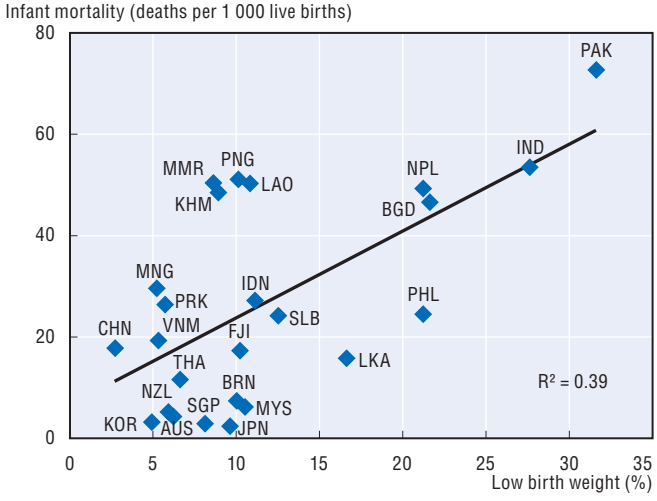
Source: *OECD Health Data 2012*; UNICEF Childinfo, World Bank, World Development Index.

2.2.2. Trends in low birth weight infants, selected countries, 2000-10



Source: *OECD Health Data 2012*; UNICEF Childinfo, World Bank, World Development Index.

2.2.3. Low birth weight and infant mortality, 2008-09 (or nearest year available)



Source: *OECD Health Data 2012*; UNICEF Childinfo, World Bank, World Development Index.

StatLink http://dx.doi.org/10.1787/888932723095

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.

It is estimated that sub-optimal breastfeeding, especially non-exclusive breastfeeding in the first six months of life, results in 1.4 million deaths and 10% of the disease burden in children younger than 5 years (WHO, 2009d).

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 6 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 or more of infants are exclusively breastfed in DPR Korea, Sri Lanka, Cambodia and the Solomon Islands, around half in India, and around one third in the Philippines, Indonesia and Malaysia. Exclusive breastfeeding rates are low, at less than 20%, in Thailand and Viet Nam.

Exclusive breastfeeding is more common among poorer women in some countries in the region, including Lao PDR, Mongolia and Viet Nam (Figure 2.3.2). Only one quarter or less of wealthier women in Lao PDR, Thailand and Viet Nam exclusively breastfeed for the first six months.

Cambodia has made notable efforts to improve breastfeeding rates. 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 6 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). In 2010, Cambodia's rate had increased further to be 71%.

Feeding practices after the age of 6 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 Asian countries including Nepal, Myanmar, Bangladesh and Sri Lanka.

WHO, UNICEF and other stakeholders have developed a Global Strategy for Infant and Young Child Feeding to revitalise commitment to appropriate infant and young child nutrition (WHO, 2007a). Breastfeeding – timing, initiation, exclusivity, duration, and use of bottles – is at the core of the strategy. The Global Strategy's specific objectives are to raise awareness of the main problems affecting feeding, identify solutions and interventions, increase the commitment of governments and other parties to optimal feeding practices, and enable mothers and other caregivers to implement informed choices about optimal feeding practices for infants and young children.

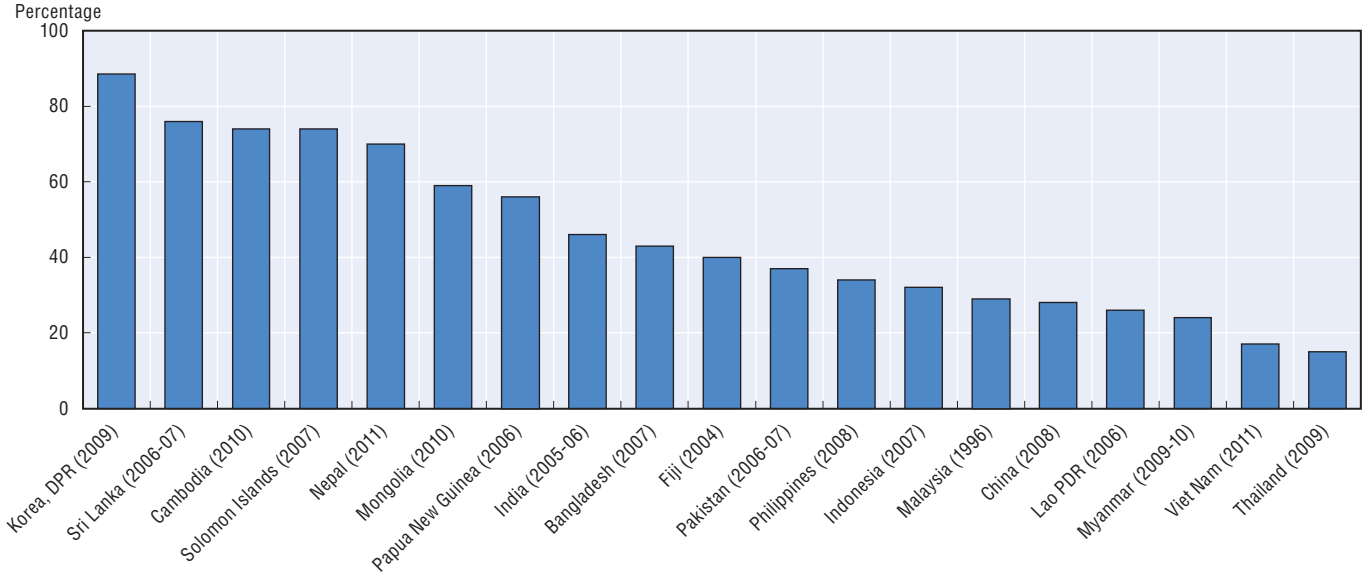
Definition and comparability

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.

Early initiation of breastfeeding occurs when an infant is put to the breast within one hour of birth.

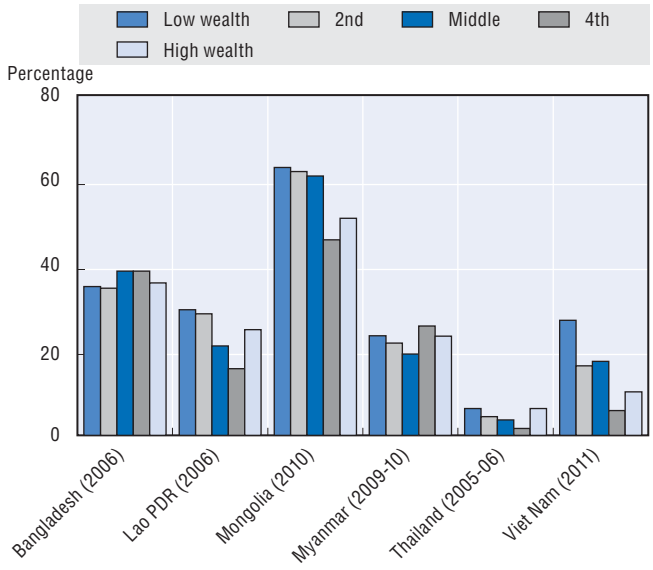
The usual sources of information on the percentage of infants who are exclusively breastfed are household surveys.

2.3.1. Infants exclusively breastfed for first six months of life



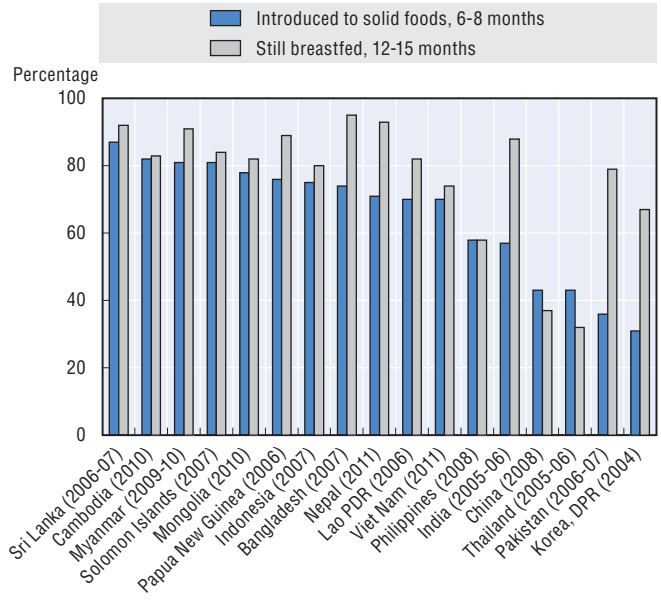
Source: UNICEF ChildInfo.

2.3.2. Exclusive breastfeeding of infants during first six months, by wealth quintile, selected countries and years



Source: Multiple Indicator Cluster Survey (MICS) 2006-2011.

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



Source: UNICEF ChildInfo.

StatLink http://dx.doi.org/10.1787/888932723114

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.

The Food and Agriculture Organization of the United Nations estimated that more than half a billion people in the Asia/Pacific region (550 million, or 15% of the population) were undernourished in 2006-08 (FAO, 2011a and 2011b). One quarter or more of the total population in Pakistan, Cambodia, Bangladesh, Mongolia and DPR Korea were affected, and the prevalence was greater than 10% in two-thirds of the countries examined here (Figure 2.4.2). In China and India alone, more than 350 million people were undernourished in 2006-08, and the region is home to two-out-of-three of the world's hungry. Poverty remains the major determinant of undernourishment.

Daily dietary energy consumption among 19 Asian countries averages around 2 600 kcal per person, compared to 3 400 in OECD countries (Figure 2.4.1). Australia, the Republic of Korea and New Zealand have high-energy diets. Food available for consumption provides less energy for persons living in DPR Korea, Lao PDR, India, Mongolia and Cambodia. 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 2 600 (Figure 2.4.3). China's sustained economic expansion has led to many gains for its population, including in food intake, which rose to over 3 000 kcal in 2009. During the world food crisis of 2006-08, domestic prices of rice and wheat were stable in China, India and Indonesia because of government controls on exports of these crops. Viet Nam, with relatively equitable land distribution, has many households that produce a surplus of rice, and so the country is a substantial rice exporter (FAO, 2011a). The situation in DPR Korea is more precarious. Sustained famine ravaged the population in the 1990s, and the economic crisis, along with drought, threatens to extend its reliance on food aid.

The economic and food crises may force 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. Rising and volatile food prices, climate change impacts, frequent natural disasters, trade policies, soaring crude oil prices and the growing use of food crops for biofuels complicate the fight against hunger. 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, 2011a; OECD, 2012b).

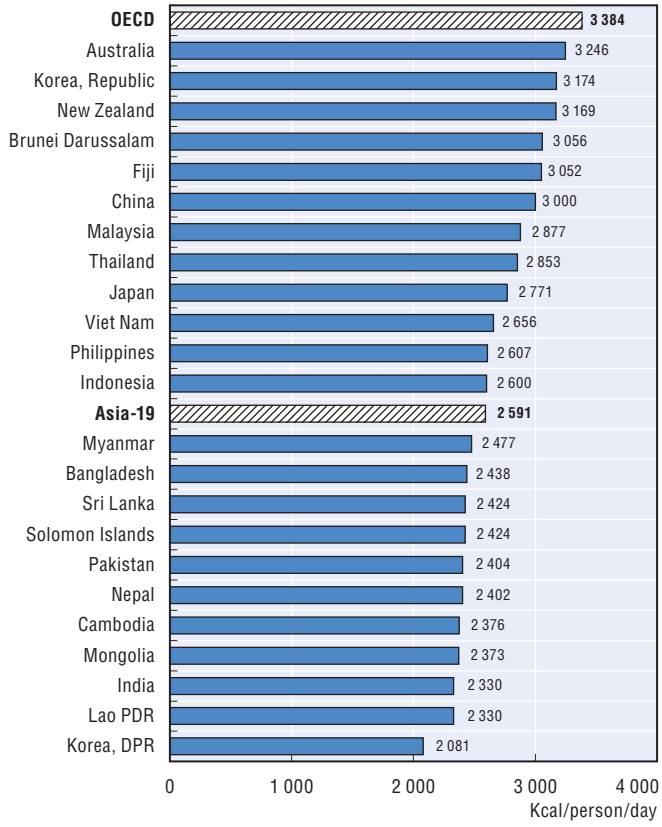
Definition and comparability

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.

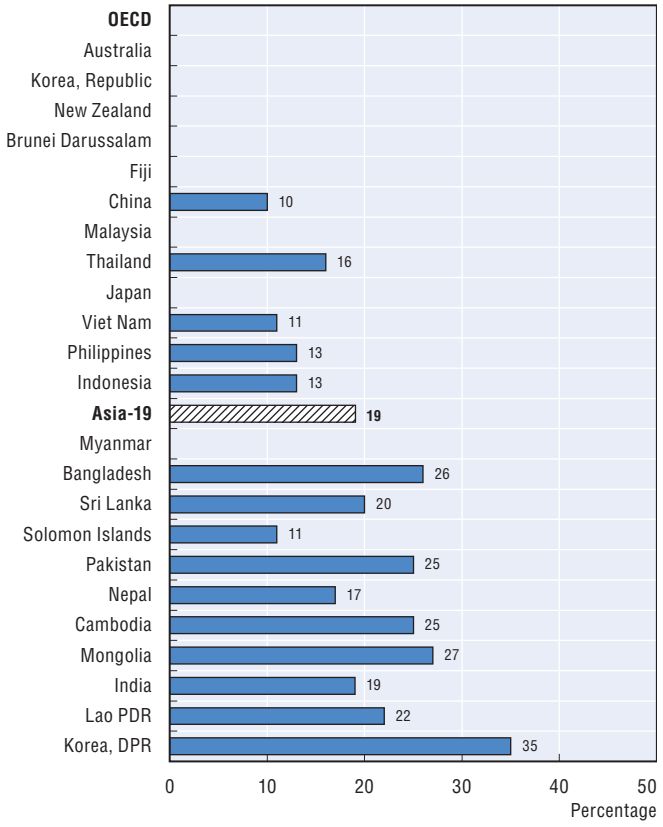
Undernourishment refers to the condition of people whose intake of calories is continuously below a minimum dietary energy requirement needed for light activity and acceptable weight-for-attained height.

2.4.1. Dietary energy consumption, 2007-09



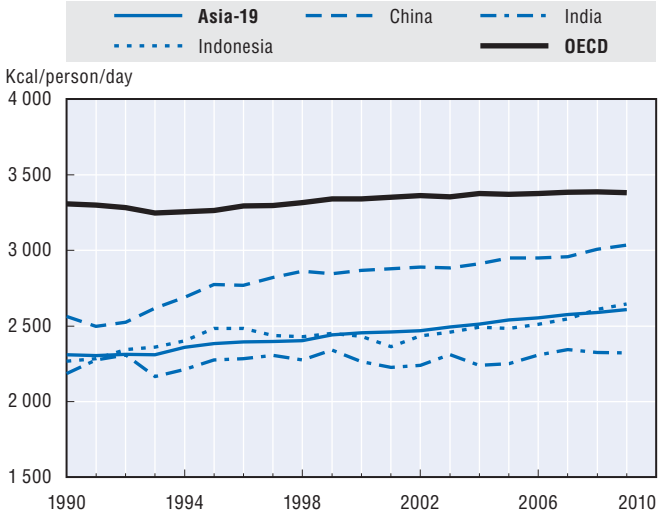
Source: FAOSTAT Database, http://faostat.fao.org/.

2.4.2. Prevalence of undernourishment in total population, 2006-08



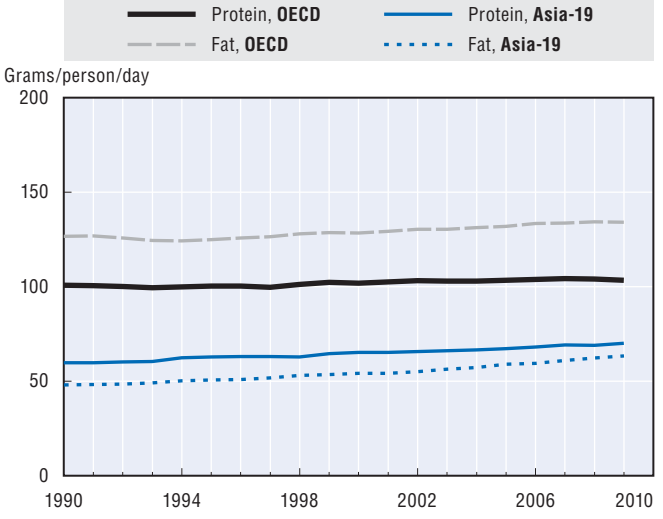
Source: FAOSTAT Database, http://faostat.fao.org/.

2.4.3. Dietary energy consumption, selected countries, 1990-2009



Source: FAOSTAT Database, http://faostat.fao.org/g.

2.4.4. Dietary protein and fat consumption, OECD and Asian countries, 1990-2009



Source: FAOSTAT Database, http://faostat.fao.org/.

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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, Bangladesh and Viet Nam, more than one quarter of adults have a body mass index less than 18.5. Across 16 Asian countries, 18% of females and 13% of males were underweight using latest available data, 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 40% or more (Bangladesh and India) (Figure 2.5.3). 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 and lower mortality, 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 around two-thirds of all mortality (see Indicator 1.4, "Mortality from all causes"). 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 2.5.2). 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 2.5.1). 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).

Definition and comparability

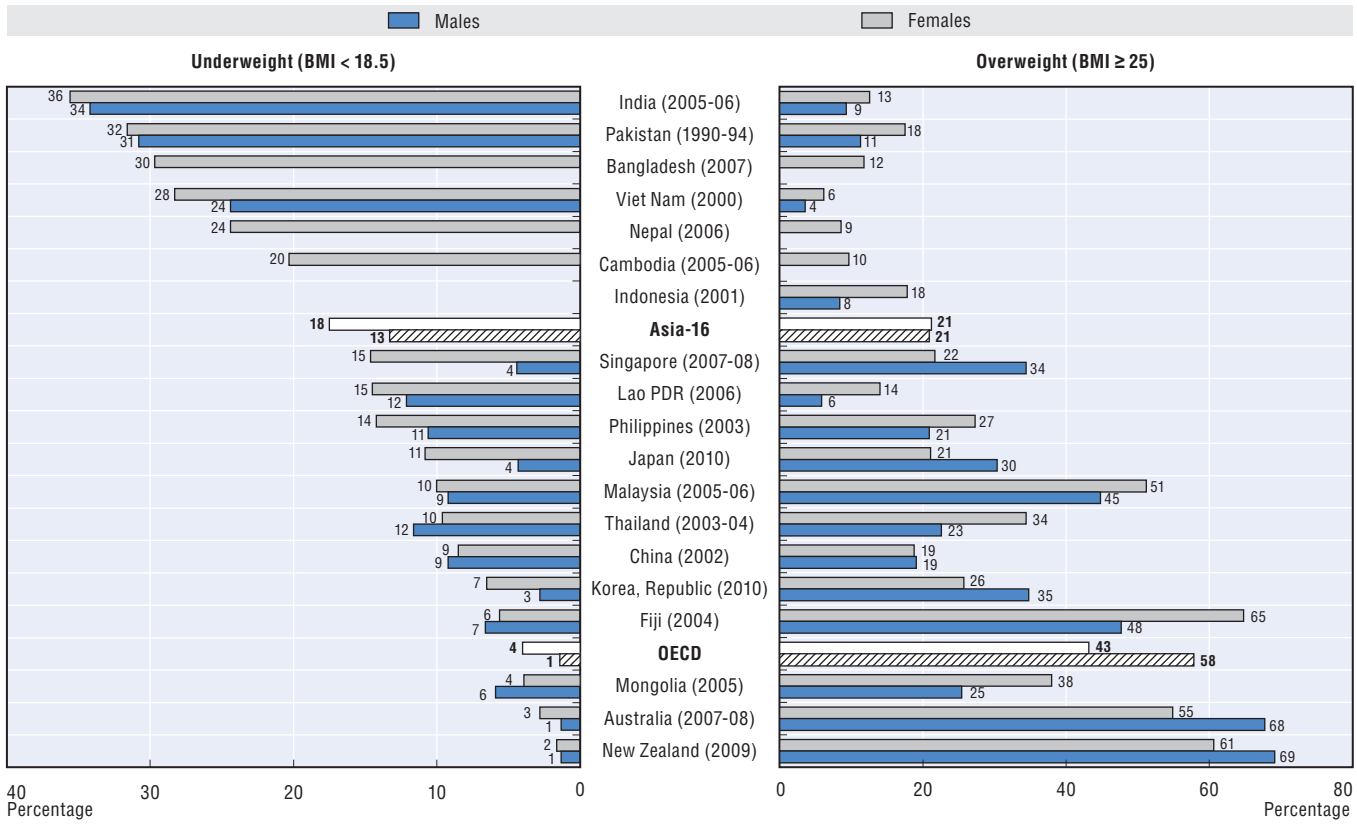
The most frequently used measure of underweight, overweight and obesity is the body mass index (BMI). This is a single number that evaluates an individual's weight in relation to height, and is defined as weight in kilograms divided by the square of height in metres (kg/m^2).

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-5 falling below minus two standard deviations from the median weight-for-age of the WHO reference population.

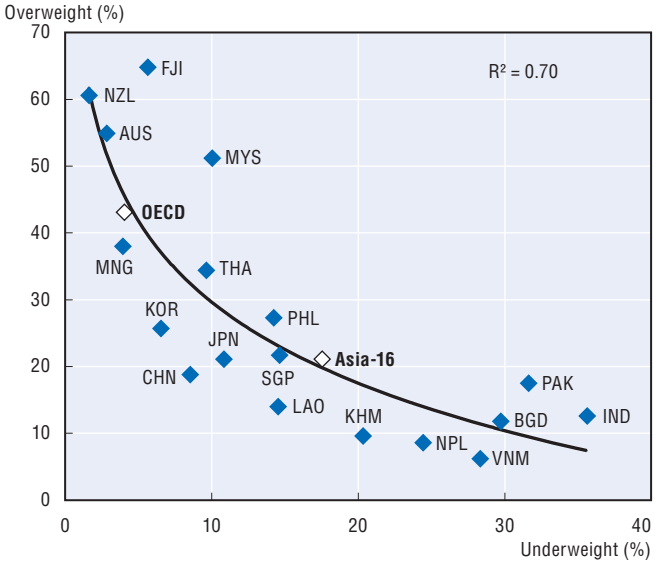
In many countries, self-reported estimates of height and weight are collected through population-based health surveys. In a smaller number of countries, including Australia, Japan, the Republic of Korea and New Zealand, health examinations measure actual height and weight. These differences limit data 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 or overweight, latest year available



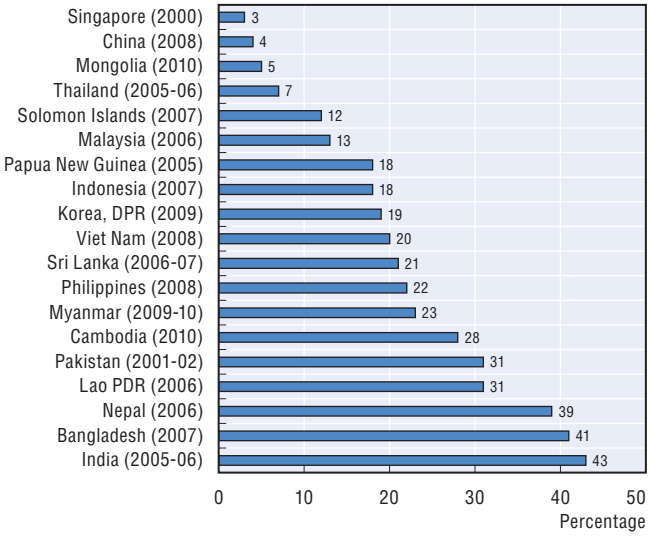
Source: *WHO Global Database on Body Mass Index; OECD Health Data 2012.*

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



Source: *WHO Global Database on Body Mass Index; OECD Health Data 2012.*

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



Source: UNICEF Childinfo.

StatLink http://dx.doi.org/10.1787/888932723152

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 2 million people annually, mostly children under the age of 5. 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 among the 19 countries in the Asia/Pacific region included here for comparison, averaging 89% of the population (Figure 2.6.1). Between 1990 and 2010, over 1.3 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 350 million people 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 having improved drinking-water sources.

More financial resources are needed in developing countries to achieve water 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 services (OECD, 2012c; WHO, 2012c).

Over 1 billion people (30%) in Asia/Pacific countries do not use improved sanitation (Figure 2.6.1). In India, Nepal, and Cambodia, only 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 24% in 1990 to 64% in 2010) and India (18% to 34%). Even so, the WHO goal to halve the worldwide proportion of people without access by 2015 is unlikely to be met (UNICEF and WHO, 2012).

Several countries, however, have recently implemented important sanitation interventions, including the Community-based Total Sanitation in Indonesia (CBTS), the National Programme for Sanitation Facilities in Mongolia, the National Sanitation Roadmap in the Philippines and the National Target Programme for Rural Water Supply and Sanitation in Viet Nam. China is implementing its National Urban Hygiene and Sanitation "Eleventh Five-Year Plan", the national plan for hygiene and sanitation (WHO, 2010b).

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 84% of persons in 2010 (Figure 2.6.2).

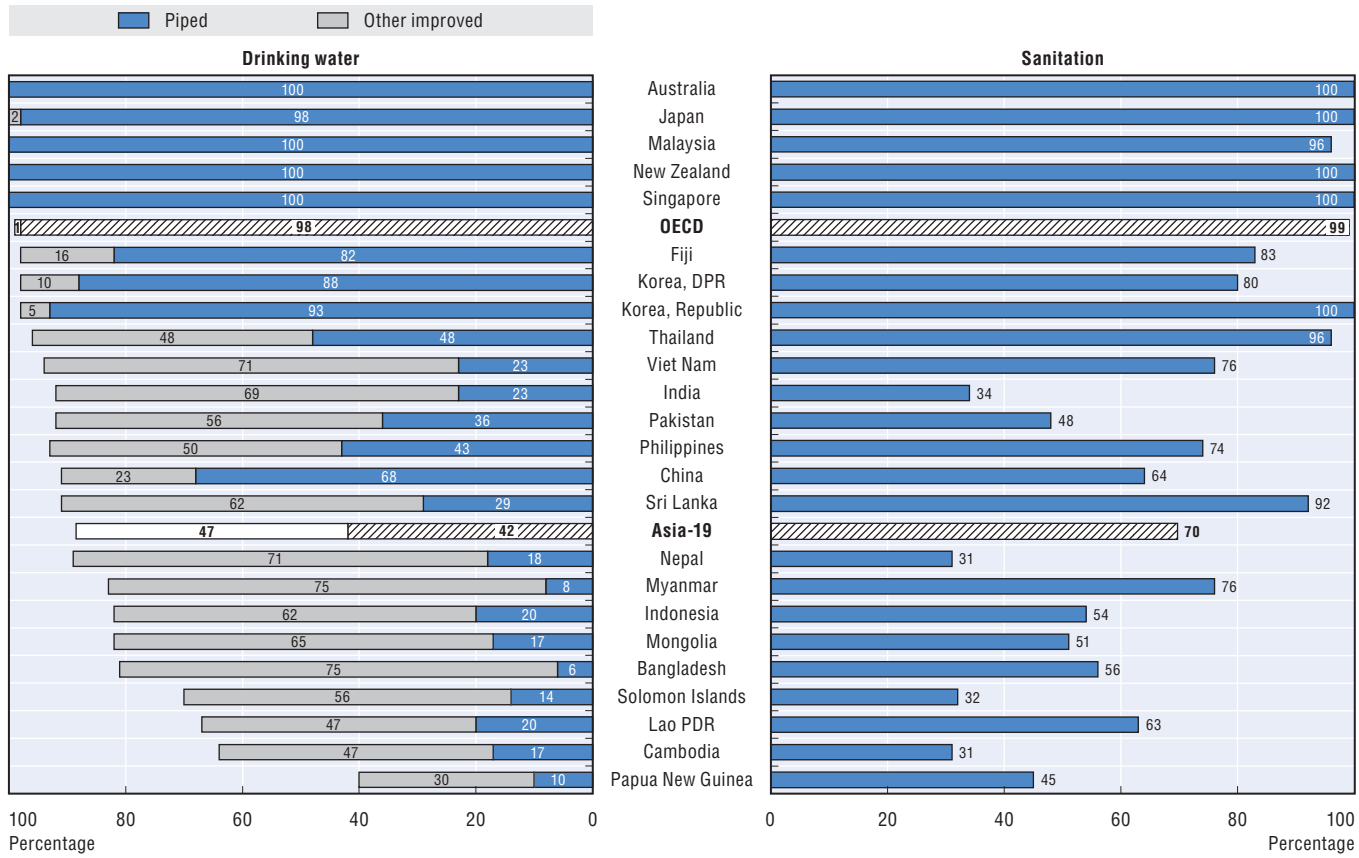
Improving sanitation in rural areas is more problematic. Across the region, only 60% of rural dwellers have access, and in India, only around 23% (Figure 2.6.3). Responsibilities, especially for rural sanitation, are not clearly defined in many Asian countries, with an urgent need to establish national frameworks, including the definition of roles and responsibilities of stakeholders (WHO, 2010b). Most of the gain in improved sanitation since 1990 has occurred in urban areas, although rapid population growth in cities has also challenged progress.

Definition and comparability

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 (UNICEF and WHO, 2012).

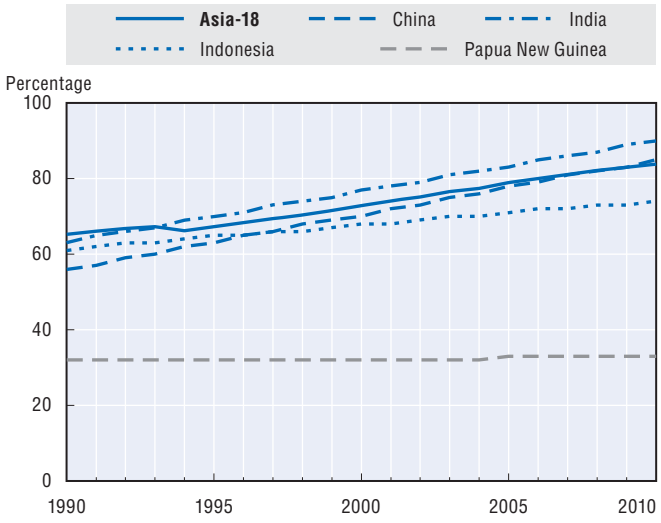
The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) database includes nationally representative household surveys and censuses that ask questions on water and sanitation, mostly conducted in developing countries. Generally, developed countries supply administrative data.

2.6.1. Access to improved drinking water and sanitation, 2010



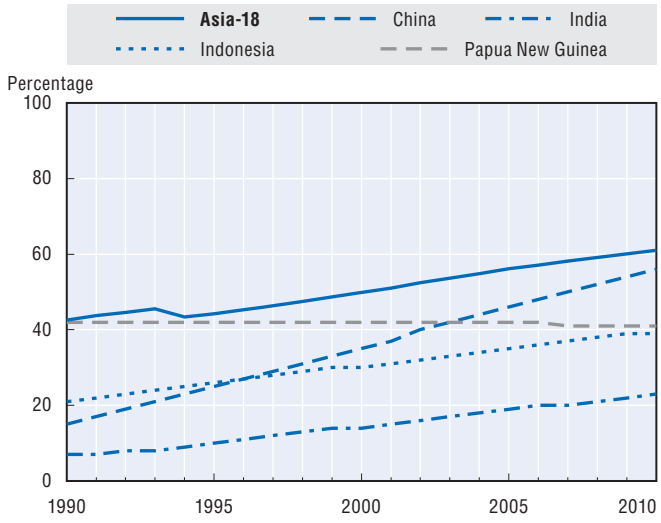
Source: UNICEF and WHO (2012).

2.6.2. Rural population with access to improved water sources, selected countries, 1990-2010



Source: UNICEF and WHO (2012).

2.6.3. Rural population with access to improved sanitation, selected countries, 1990-2010



Source: UNICEF and WHO (2012).

StatLink http://dx.doi.org/10.1787/888932723171

Tobacco smoking is a common risk factor for a large number of diseases that cause illness and death, including lung and other cancers, COPD and cardiovascular disease. The global tobacco epidemic is directly responsible for around 12% of adult deaths worldwide, or some 5 million deaths each year, many of which occur in low- and middle-income countries (WHO, 2011h and 2012d).

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 2009, rates among men were highest in Papua New Guinea and Indonesia, at over 50%, and many more countries had male daily smoking rates over 40%. Rates among specific age groups may be even higher; in China, the smoking rate among men aged 45-64 years rises to 63%. In Fiji, Australia and New Zealand however, less than 20% of adult males smoked daily. The regional average for men, at 36%, was significantly higher than the 27% of males who smoked daily in OECD countries.

There are large male-female disparities in the Asia/Pacific region, with only 5% of women reporting smoking daily in 2009. Rates were highest in Papua New Guinea (27%), and Nepal (25%) – where it is a common practice among rural women – as well as in the developed countries of New Zealand (17%) and Australia (14%).

Around one-third of the world's smokers live in China. Within the next 15 years, unless habits change, smoking will kill an estimated 2 million Chinese annually. Control policies face formidable opposition from large tobacco companies, and low public awareness, especially among the rural population, adds to the public health challenges (Cui, 2010; Herd *et al*., 2010).

In many countries in the region, 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 (Hosseinpoor *et al*., 2012). In Indonesia, the world's third largest tobacco consumer, smokers spent around 12% of their household income on cigarettes in 2005. Clove cigarettes (*kretek)* and regular tobacco are comparatively cheap to buy, either by the stick or packet (Figure 2.7.3). Advertising is largely unrestricted, and health warnings or smoking bans are few. Tobacco taxes are low in Indonesia, but still 6% of government revenue was derived from cigarette taxes in 2007 (Barber *et al*., 2008).

Increasing tobacco prices through higher taxes is an effective intervention to reduce tobacco use, by discouraging youth from beginning cigarette smoking and encouraging smokers to quit. Higher taxes also assist in generating additional government revenue. However, only a few countries in the region (New Zealand, Sri Lanka) are close to having total taxes that constitute 75% or more of the tobacco retail price (Figure 2.7.3).

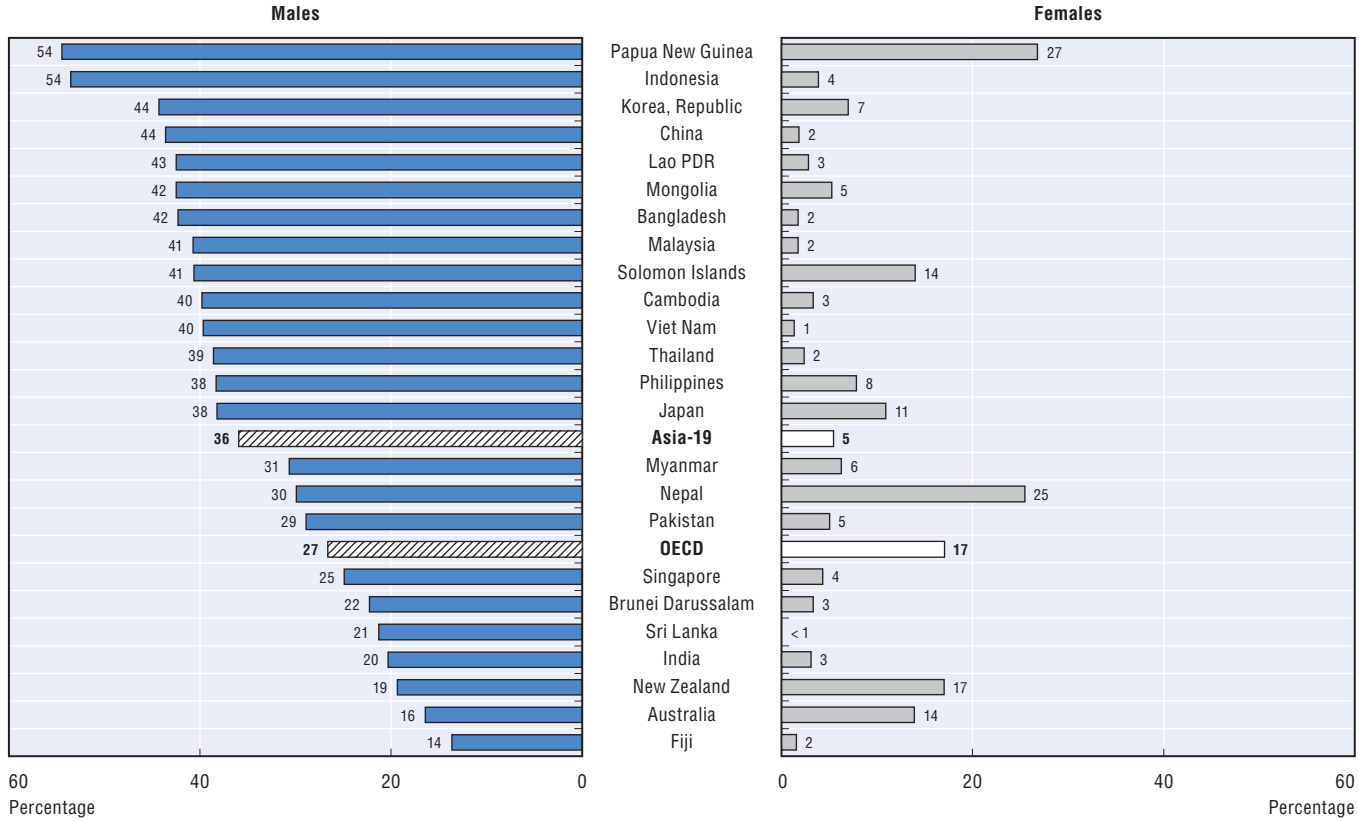
Health warnings against smoking, including labels on tobacco product packaging and anti-tobacco mass media campaigns, also aid in reducing tobacco use. Australia, Singapore and Thailand report that graphic pictorial warning labels have effectively impacted smoking-related behaviour (WHO, 2011h).

Definition and comparability

Adults smoking daily is defined as the percentage of the population aged 15 years and over who reported smoking every day. Estimates for 2009 were based on data obtained from a broad range of health and household surveys, including the Global Adult Tobacco Survey (GATS). Results were age-standardised to the WHO Standard Population.

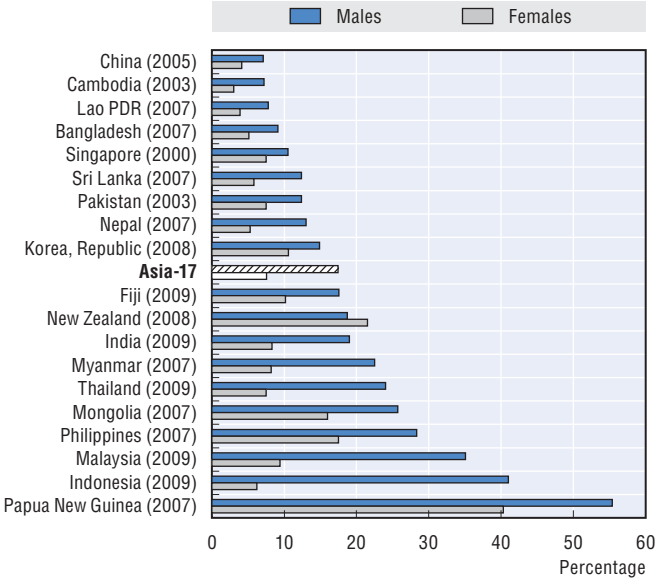
Current tobacco use among youth is derived from the Global Youth Tobacco Survey. It is defined as the percentage of young people aged 13-15 years who consumed any tobacco product at least once during the last 30 days prior to the survey.

2.7.1. Adults smoking daily, 2009



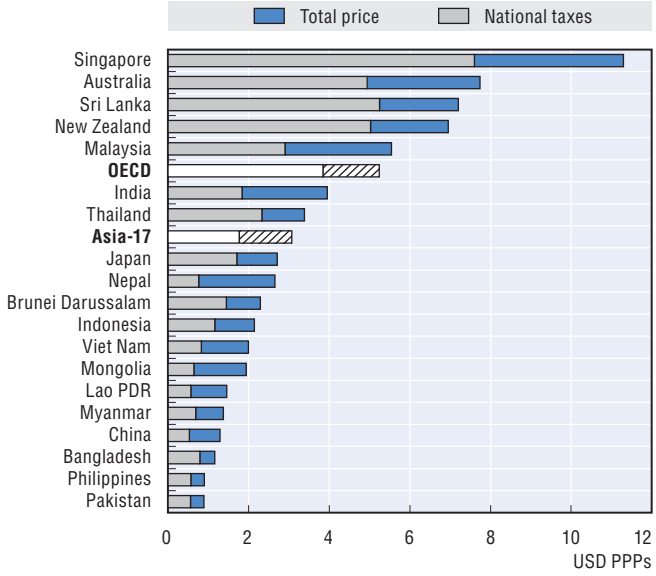
Source: WHO (2011h); *OECD Health Data 2012*.

2.7.2. Current tobacco use among youth aged 13-15 years, 2009 (or nearest year)



Source: WHO (2011h).

2.7.3. Retail price of 20-cigarette pack of most-sold brand, 2010



Source: WHO (2011h).

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Although most people enjoy drinking alcohol responsibly, the health burden related to hazardous and harmful alcohol consumption, both in terms of morbidity and mortality, is considerable in many parts of the world. High alcohol intake increases the risk for chronic diseases such as liver cirrhosis, cancers, cardiovascular diseases and injury, and impacts foetal and child development. Drunkenness and alcohol dependence also leads to harmful social consequences, such as drink-driving and violence (WHO, 2011i).

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 are about 2% of GDP (Rehm *et al.*, 2009; 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 the Republic of Korea, Australia, New Zealand and Japan consumed over seven litres of alcohol per capita in 2008. In Thailand; Macao, China, the Lao PDR; China and the Philippines, consumption was between four and seven litres. Because cultural and religious traditions in a number of the remaining countries prohibit drinking alcohol, consumption figures in these are minimal (Figure 2.8.3). In some 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 and economies in 2008 was a modest 2.4 litres per capita, compared to 10.0 in OECD countries.

Average consumption across the whole region exhibited an increase between 1990 and 2008 (Figures 2.8.1 and 2.8.2), although variations exist among countries. Among countries with significant intake, alcohol consumption declined in DPR Korea; Hong Kong, China; Japan; New Zealand and Australia. Consumption increased in Macao, China; Cambodia; Mongolia; China; the Lao PDR and Thailand. For China, alcohol consumption increased from 3.4 litres per capita in 1990 to 4.7 in 2007, 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 2.8.3). In the Southeast Asian region in 2005, 22% of drinkers reported weekly heavy episodic drinking during the last 12 months (WHO, 2011i). In Japan and the Lao PDR around 20% of all males surveyed in 2005 reported regular heavy drinking. In Australia in 2010, one in five people aged 14 and over were at risk of alcohol-related harm over their lifetime, and two in five were at risk of harm from a single drinking occasion in the past 12 months; about 13% of recent drinkers admitted to driving under the influence of alcohol (AIHW, 2012). In India and Pakistan, two low alcohol-consuming countries, a high proportion of drinkers drink heavily on single occasions.

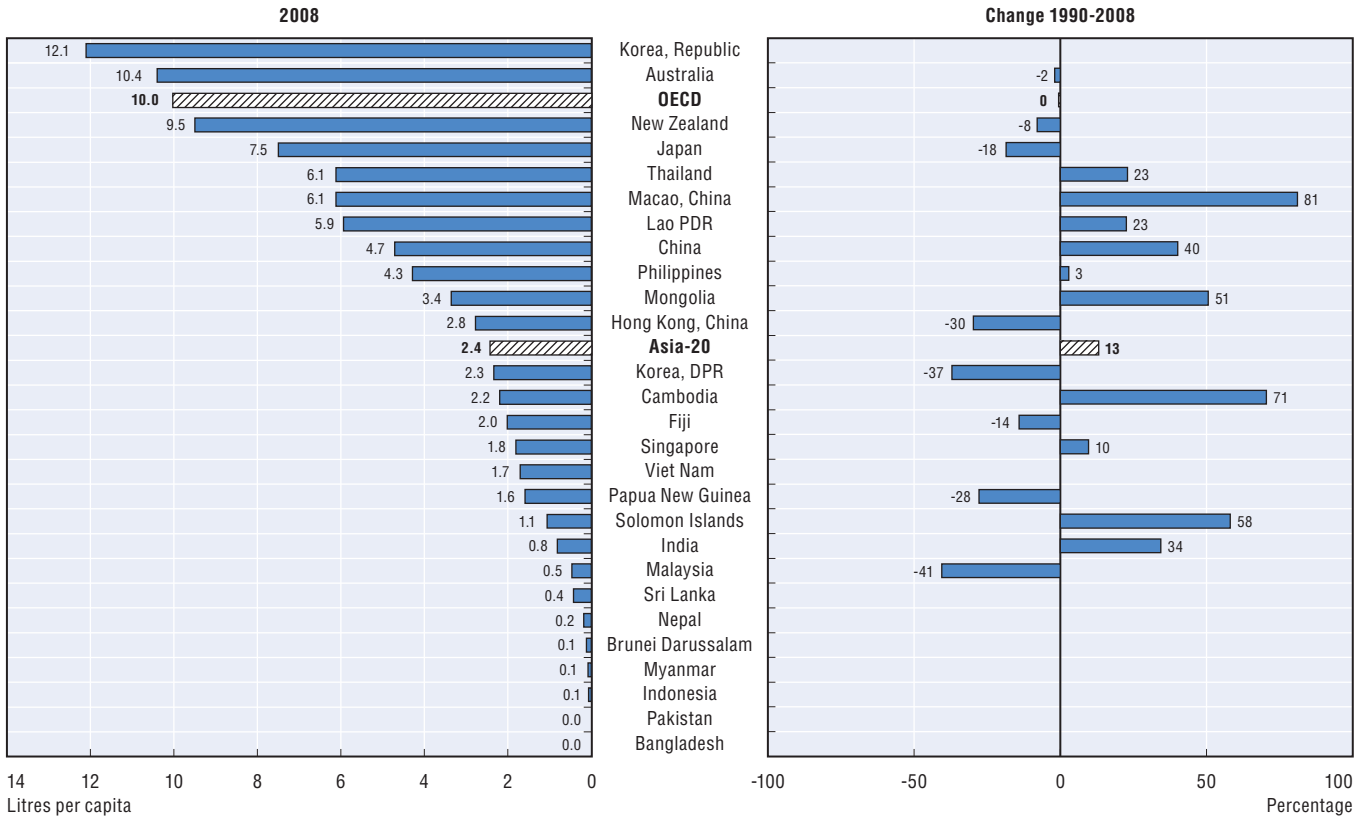
The World Health Organization endorsed a Global Strategy to Reduce the Harmful Use of Alcohol in 2010, through direct measures such as medical services for alcohol-related health problems, and indirect measures, such as the dissemination of information on alcohol-related harm. The strategy contains a set of principles to guide the development and implementation of policies at all levels, sets priority areas for global action, and recommends target areas for national action.

Definition and comparability

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.

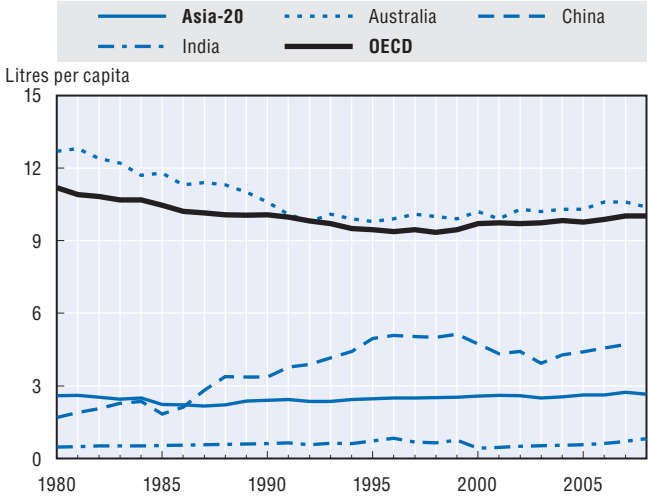
The methodology to convert alcoholic drinks to pure alcohol may differ across countries. Data are for recorded alcohol, and exclude homemade sources, cross-border shopping and other unrecorded sources. Information on drinking patterns are derived from surveys and academic studies (WHO, 2011i).

2.8.1. Recorded alcohol consumption, population aged 15 years and over



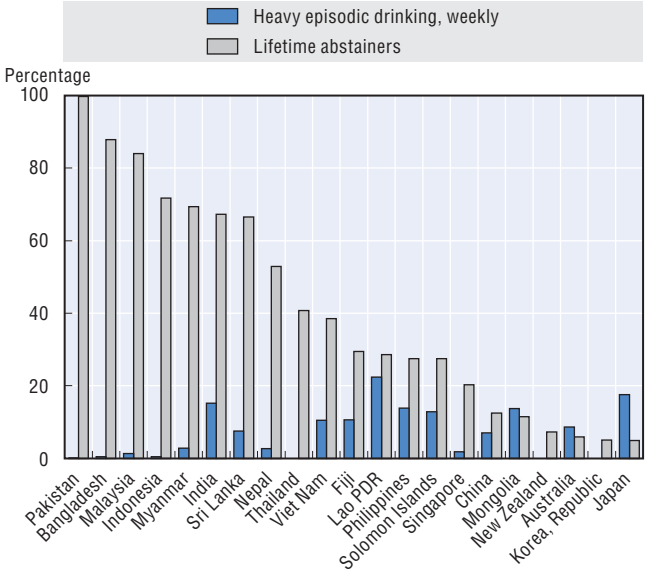
Source: WHO Global Information System on Alcohol and Health (GISAH); *OECD Health Data 2012*.

2.8.2. Trends in alcohol consumption, selected countries, 1980-2008



Source: WHO Global Information System on Alcohol and Health (GISAH); *OECD Health Data 2012*.

2.8.3. Patterns of consumption among males, 2005 (or nearest available year)



Source: WHO Global Information System on Alcohol and Health (GISAH).

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Chapter 3

Health care resources and utilisation

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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 and economies. 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, the latest year available. This is a number higher than the average among OECD countries (3.1 in 2010) (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. In the mid-2000s, there were 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 and economies. Despite its relatively low health spending per capita, Mongolia also has a high number of physicians per capita (2.9 in 2011), much higher than the average among Asian countries and economies. Since 2000, the overall number of doctors has greatly increased in specialist and private hospitals in Mongolia, and there is evidence of oversupply of doctors, in particular of medical specialists. Despite this large supply in Mongolia, there is a shortage of experienced doctors in rural areas (Asian Development Bank, 2008).

In contrast, Papua New Guinea, Nepal, the Solomon Islands, Lao PDR and Cambodia have the lowest number of physicians per capita, 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, 2010b), and the number of doctors now exceeds the average across Asian countries and economies, although it remains less than half the average in OECD countries.

Nurses outnumber physicians in most Asia/Pacific countries and economies, but with a few exceptions. The number of qualified nurses is the highest in high-income countries such as Japan, Australia and New Zealand, with all of these countries having ten nurses per 1 000 population. The supply is much lower in a number of low-income countries, including Nepal, Bangladesh, Papua New Guinea and Myanmar, where there are about 0.5 nurses per 1 000 population or less. The number of nurses per capita is also relatively low in India with less than one nurse per 1 000 population, less than half the average across Asian countries and economies (Figure 3.1.2).

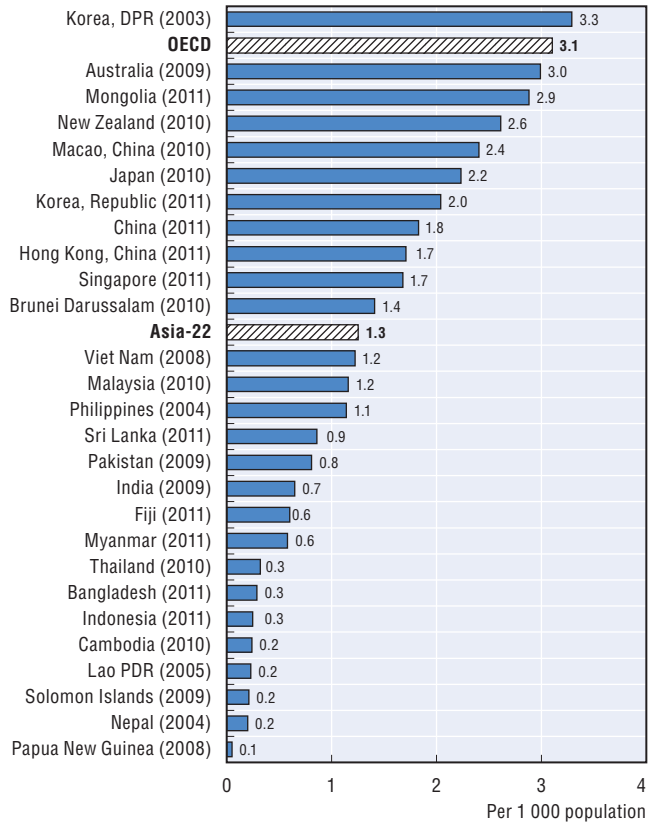
In many Asia/Pacific countries and economies, there are between two and five nurses per doctor, which is also the case in most OECD countries (Figure 3.1.3). While there are more than eight nurses per doctor in Papua New Guinea and the Solomon Islands, this simply reflects the fact that there are very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

Definition and comparability

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

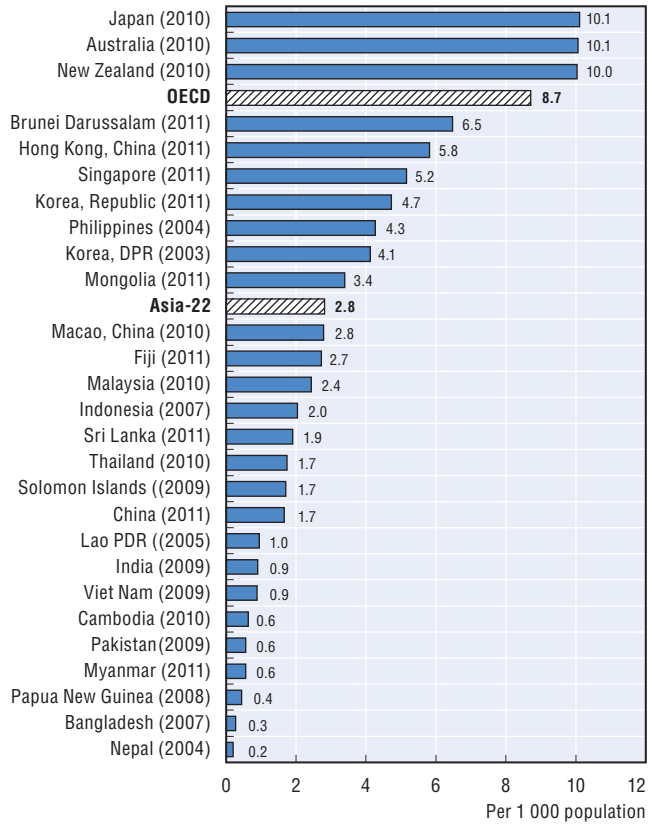
Nurses are defined as persons who have completed a programme of basic nursing education and are qualified to provide nursing care. Although midwives should normally be excluded from nurses, some Asia/Pacific countries report midwives together with nurses.

3.1.1. Doctors per 1 000 population, latest year available



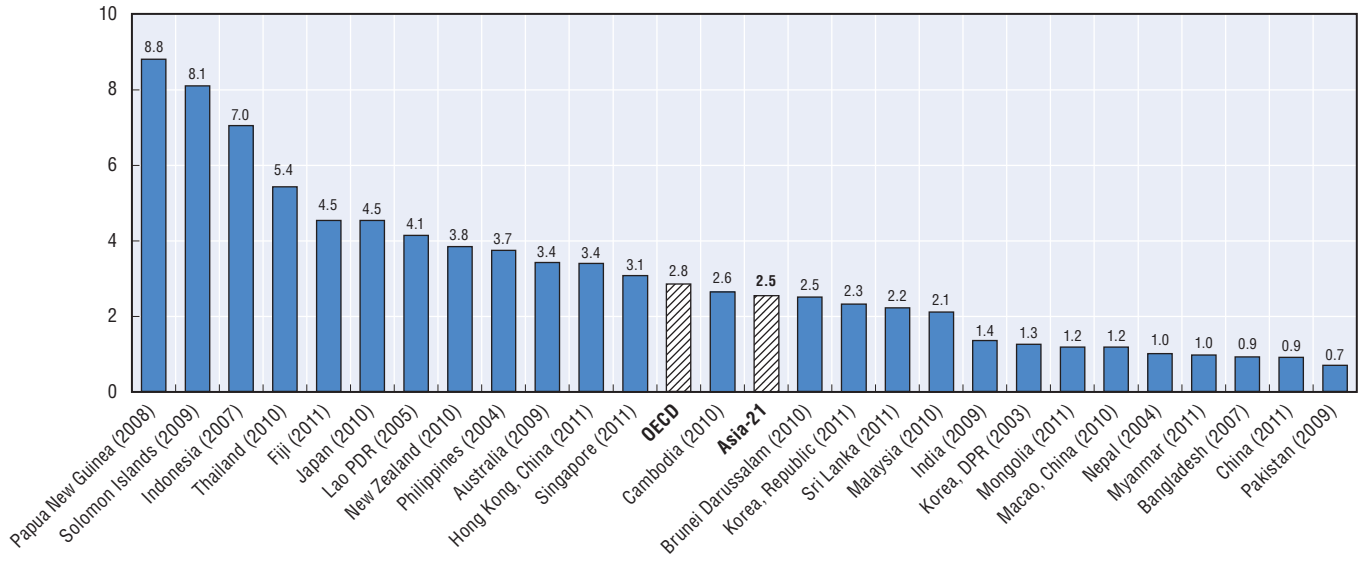
Source: *OECD Health Data 2012*; *WHO Global Health Observatory Data Repository*, national data sources.

3.1.2. Nurses per 1 000 population, latest year available



Source: *OECD Health Data 2012*; *WHO Global Health Observatory Data Repository*, national data sources.

3.1.3. Ratio of nurses to doctors, latest year available



Source: *OECD Health Data 2012*; *WHO Global Health Observatory Data Repository*, national data sources.

StatLink http://dx.doi.org/10.1787/888932723228

Consultations with doctors are an important measure of overall access to health services, since most illnesses can be managed without hospitalisation, and a doctor consultation often precedes an hospital admission. In general, consultation rates tend to be highest in the high and middle-income economies in the Asia/Pacific region, and significantly lower in low-income economies.

The number of doctor consultations per person per year ranges from about thirteen in Japan and the Republic of Korea, to fewer than two in Bangladesh, Cambodia, the Solomon Islands and Papua New Guinea (Figure 3.2.1). Generally, doctor consultation rates in the developing Asia/Pacific countries and economies are much lower than the OECD average (6.4 consultations per person per year).

Cultural factors may play a role in explaining some of the variations. For example, Japan; the Republic of Korea; Hong Kong, China and Macao, China 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.

Information on consultations can be used to estimate annual numbers of consultations per doctor in countries. This estimate varies by nearly six-fold across Asia/Pacific countries and economies (Figure 3.2.2). The range is comparable to that reported across OECD countries, although on average there are many more consultations per doctor in the Asian economies covered (about 4 000), compared to the OECD average (2 300). The number of consultations per doctor should not be taken as a measure of productivity, since consultations can vary in length and effectiveness, and because it excludes work devoted to inpatients, administration and research. It is also subject to the comparability limitations (see box below on "Definition and comparability"), and in particular variations across countries as to the extent to which physicians conduct routine consultations.

Figure 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 simple correlation does not necessarily imply causality, since overall living standards may influence both consultation rates and life expectancy. There are also country examples such as Mongolia where relatively high consultation rates are associated with low life expectancy, indicating that other factors beyond doctor consultations can affect life expectancy.

While 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. Figure 3.2.4 shows the ratio of doctor consultation rates in the poorest and middle socio-economic quintiles to that in the richest quintile in a group of countries where data are available. Although the poorest quintiles might be expected to have the greatest need for doctor consultations, their 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 based more on needs than ability to pay.

Definition and comparability

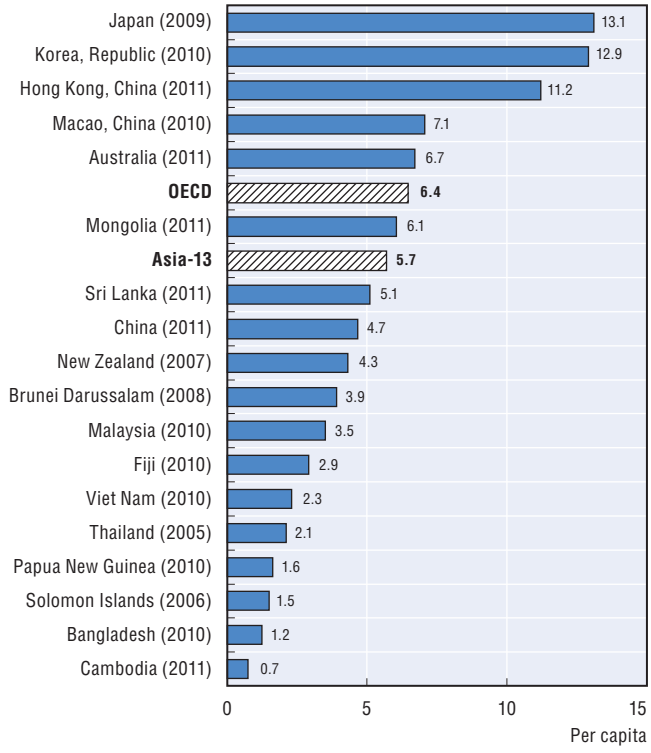
Consultations with doctors are defined as contacts with physicians (both generalists and specialists). These may take place in doctors' offices or clinics, in hospital outpatient departments, and in homes. Doctors include physicians qualified in either allopathic medicine or other forms of medicine such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

Two main data sources are 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. Since physicians in the private sector provide a large share of overall consultations in most of these countries, existing administrative data sources do not cover these. The alternative data source is household health surveys, but these tend to produce lower estimates owing to incorrect recall and non-response rates.

Administrative data have been used where available. It is assumed in many cases that the data for outpatient visits refer to out patient visits to physicians, however, since visits can also be with non-physicians, consultation rates may be over-estimated. In Papua New Guinea and Solomon Islands, most reported outpatient visits in the public sector may in fact be with non-physicians, such as nurses.

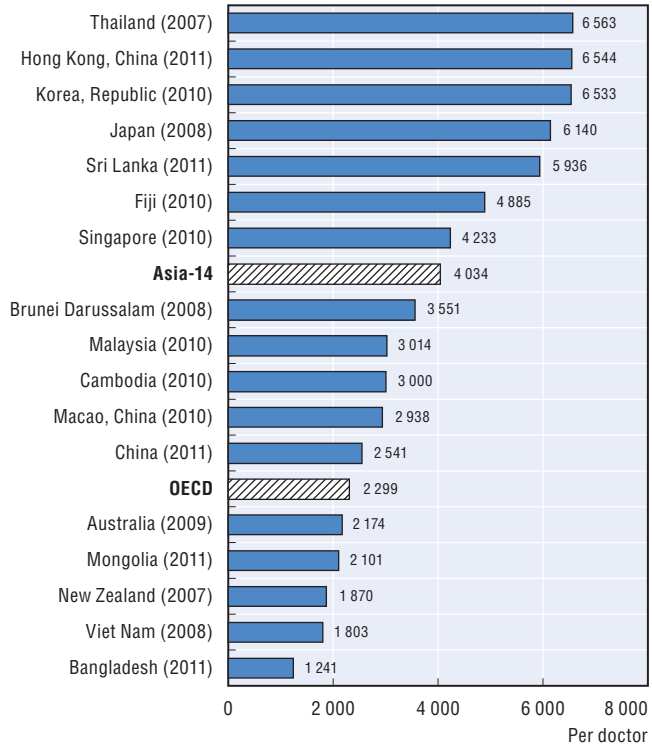
In those countries where administrative data only cover the public sector (such as Hong Kong, China, Solomon Islands, Sri Lanka), household survey data have been used to obtain an estimate of the ratio of private sector to public sector consultation rates. For many countries (such as China, Mongolia, Thailand, Viet Nam), 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 interpreting the data.

3.2.1. Doctor consultations per capita, latest year available



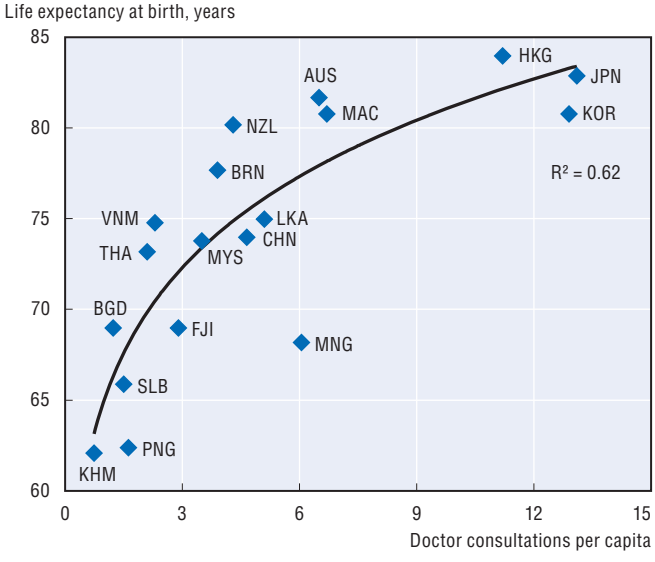
Source: OECD Health Data 2012; national data sources (see Annex A).

3.2.2. Number of consultations per doctor, latest year available



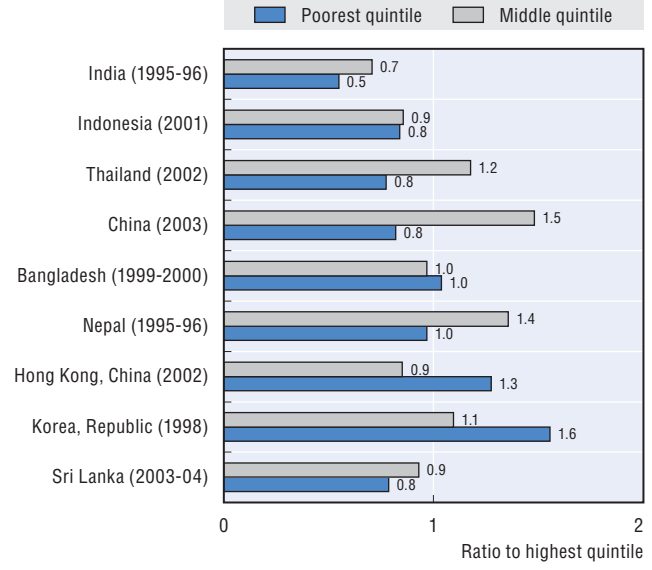
Source: OECD Health Data 2012; national data sources (see Annex A).

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



Source: *OECD Health Data 2012*; national data sources (see Annex A).

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



Source: National data sources (see Annex A).

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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 with over 13 beds per 1 000 population (Figure 3.3.1). These levels are more than 20 times higher than in countries such as Myanmar, Indonesia, Pakistan, Bangladesh and the Philippines, 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. The number of hospital beds across OECD countries is – on average – twice that of the Asian countries and economies.

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 might 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.

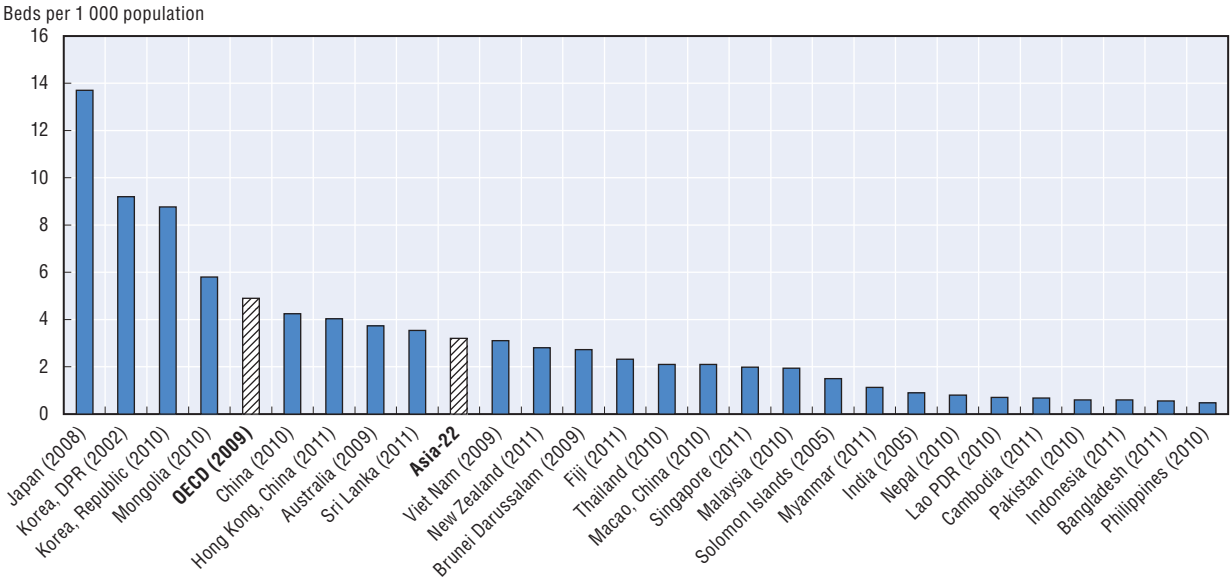
In the Asia/Pacific region, there is a large variation in ALOS for acute care, although this variation is not as large as that in the overall supply of hospital beds. The longest lengths of stay are in Japan, the Republic of Korea and China, at over eight days on average. These are two to three times longer than those in Sri Lanka, Bangladesh and Thailand (Figure 3.3.2). The shortest length of stay is in Sri Lanka, at 3.0 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. The ALOS in the Asian countries and economies is lower than the average in OECD countries (6.4 *versus* 7.2 days).

In Japan and the Republic of Korea, there may be an issue 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).

Definition and comparability

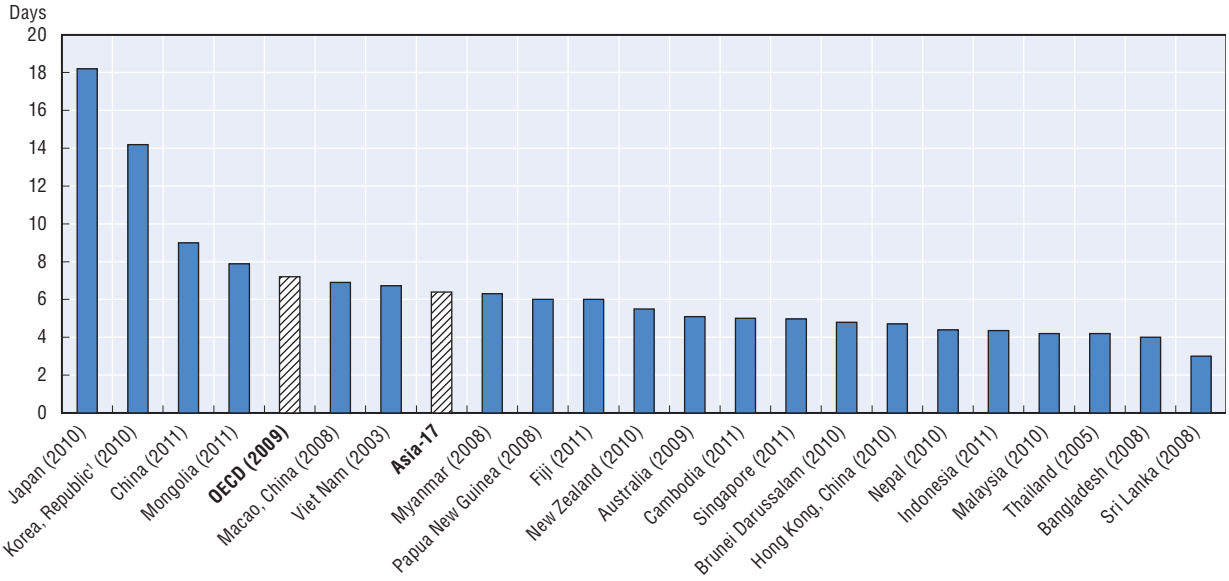
All hospital beds should normally be counted, including those for acute care and for chronic/long-term care, in both the public and private sectors. The figures reported for ALOS are for average length of stay for acute care only. This refers to the number of days (with an overnight stay) that patients 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, 2011 (or nearest year available)



Source: *OECD Health Data 2012*; WHO (2012f).

3.3.2. Average length of stays for acute care in hospitals, 2011 (or nearest year available)



1. The data for the Republic of Korea refer to average length of stay for in-patient care (including long-term care beds in hospitals).

Source: *OECD Health Data 2012*; national data sources (see Annex A).

StatLink http://dx.doi.org/10.1787/888932723266

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 for 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 (Figure 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 countries and economies are comparable to those in the OECD (*e.g.*, Hong Kong, China).

Within the region, the highest rates are in Sri Lanka 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 and Germany). Discharge rates are lowest in Nepal, Myanmar and Bangladesh. In general, those countries that have more hospital beds tend to have higher discharge rates, and *vice versa* (see Indicator 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. Figures 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 might be considered an indicator of "avoidable hospitalisation" and reflect shortcomings of the primary care sector (OECD, 2011). Discharge rates for asthma in Sri Lanka are substantially higher than in other countries and economies, indicating a high prevalence of under-treated asthma in the community requiring hospital admission.

Definition and comparability

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.

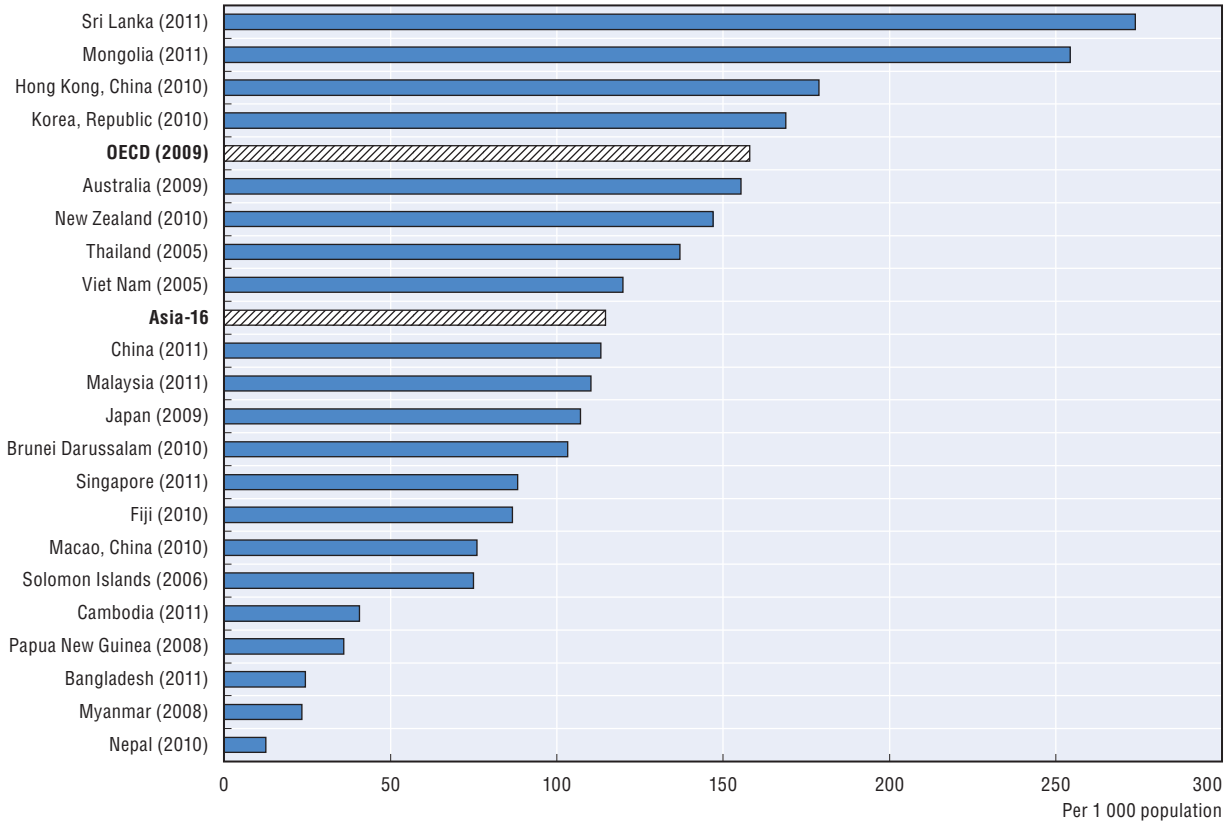
There are three potential data sources on discharge rates: administrative data, hospital surveys and household health surveys. As in OECD countries, the estimates from administrative sources tend to be higher than those from household health surveys because of incorrect recall and non-response rates.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

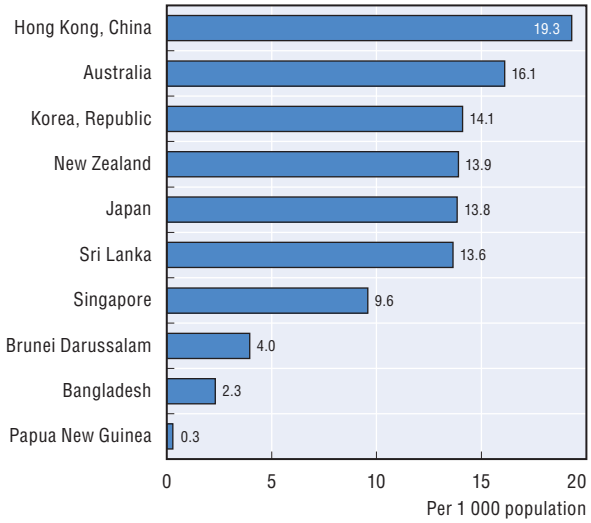
For other economies, the exact scope of reported data is not always clear, and so other inconsistencies may remain.

3.4.1. Hospital discharges per 1 000 population, 2011 (or nearest year available)



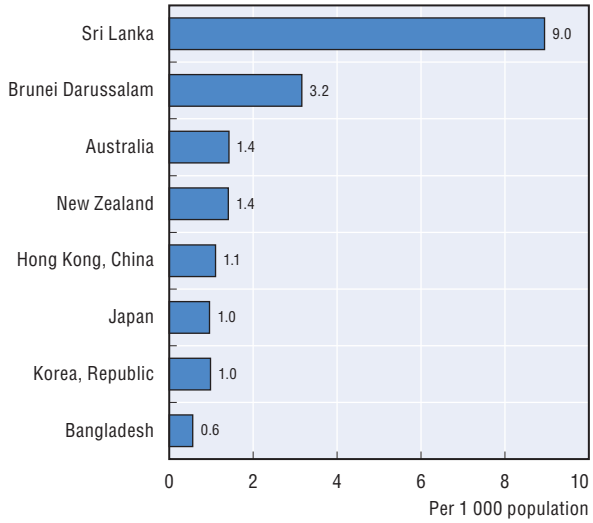
Source: *OECD Health Data 2012*; national data sources (see Annex A).

3.4.2. Hospital discharges for circulatory disease per 1 000 population, 2010 (or nearest year available)



Source: *OECD Health Data 2012*; national data sources (see Annex A).

3.4.3. Hospital discharges for asthma per 1 000 population, 2010 (or nearest year available)



Source: *OECD Health Data 2012*; national data sources (see Annex A).

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The provision of medical care and counselling during pregnancy and birth is an important determinant of the health 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.

Averaged across countries, around 85% of pregnant women in the Asia/Pacific region receive at least one antenatal visit, however access to maternal health care varies across the region (Figure 3.5.1). Coverage is high in DPR Korea, Fiji, Thailand, Mongolia and Sri Lanka. However, in Pakistan, Papua New Guinea, Nepal and Bangladesh, more than 40% of pregnant women did not attend a single antenatal visit, and in the Lao PDR as many as two thirds of pregnant women lacked such care (WHO, 2011b).

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 a skilled health professional such as a doctor, nurse or midwife, but there are several countries where the proportion is much lower (Figure 3.5.1). Less than 30% of births in Bangladesh are attended by a medically trained provider, with most deliveries assisted by *dais*, or untrained birth attendants. In Pakistan, around 45% of births are attended by medically trained persons, with traditional birth attendants assisting with more than half of deliveries. 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 78% in 2010.

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 3.5.2). One-third of deliveries in Pakistan takes place in a health facility, with the other two-thirds taking place at home. Home deliveries are also still predominant in Nepal, India, the Philippines and Indonesia. 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 and Macro International Inc., 2008). In Australia, almost all deliveries take place in a health facility.

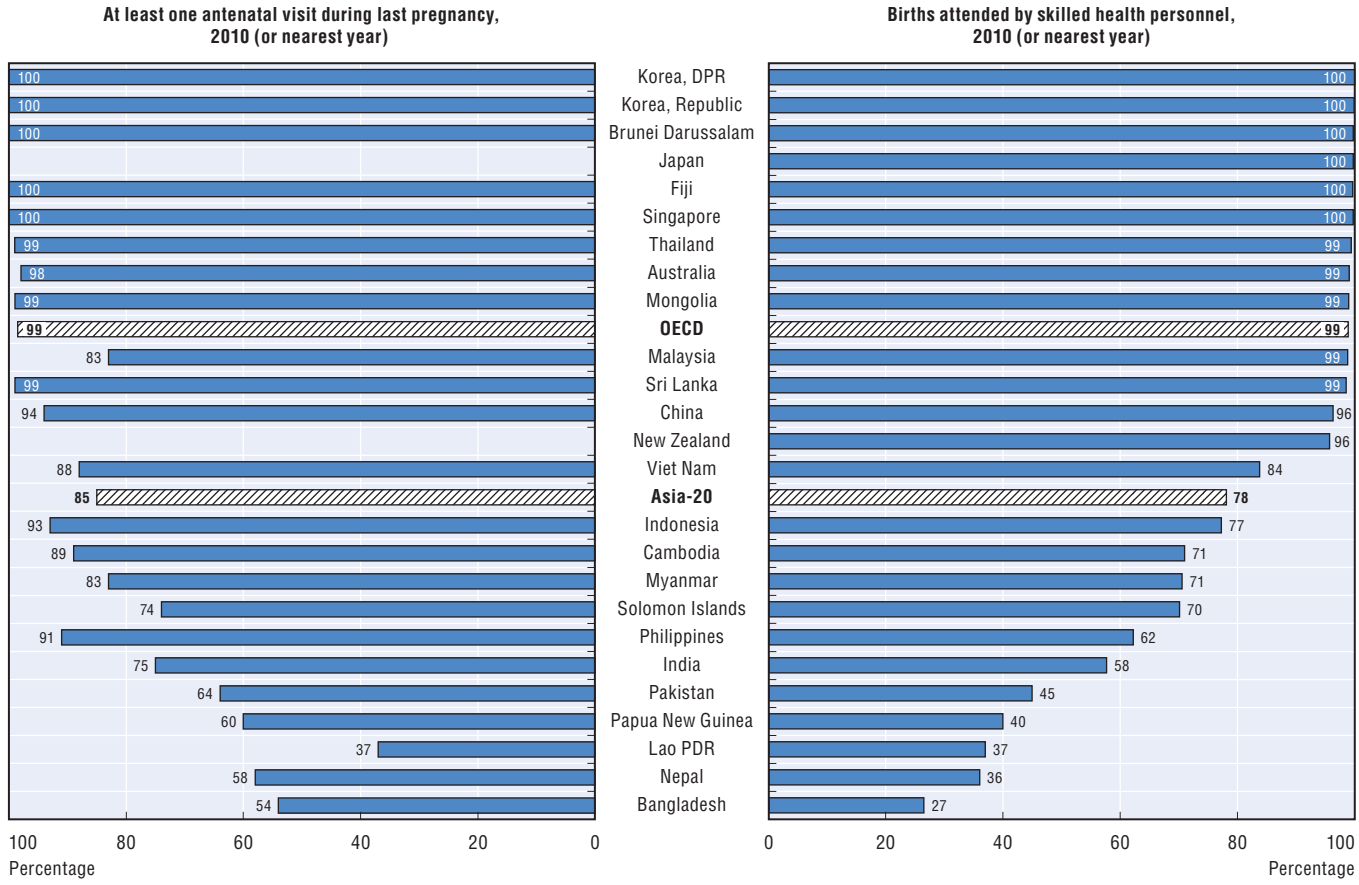
Poverty is the overarching reason why developing countries in the region have poor standards of maternal and newborn health. There is, for example, a strong association between household wealth and having a birth attended by skilled health personnel (Figure 3.5.3). In the Lao PDR and Bangladesh, the probability of having a birth attended by skilled health personnel for a high wealth household woman is 27 and 11 times higher, respectively, than for a low wealth household woman. Thailand and Viet Nam are two countries where levels of care are more equitable.

Definition and comparability

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.

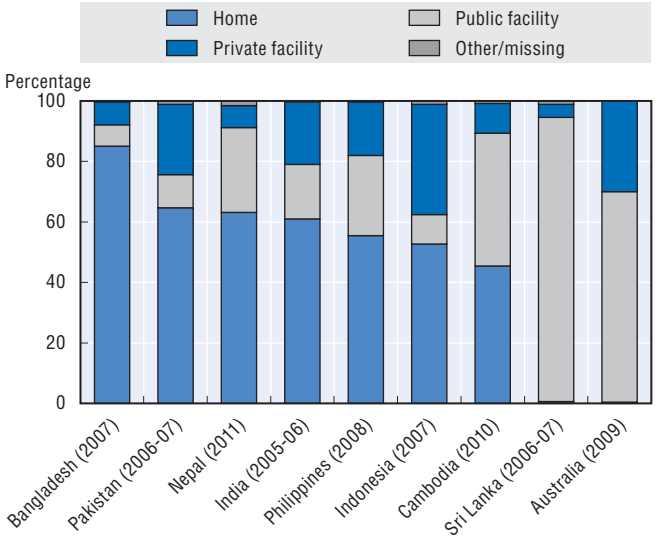
Women who had a live birth in the five years preceding the survey are asked questions about that birth, including whether any antenatal care was received and what type, who provided assistance during delivery, and where the delivery took place.

3.5.1. Provision of care during pregnancy and birth



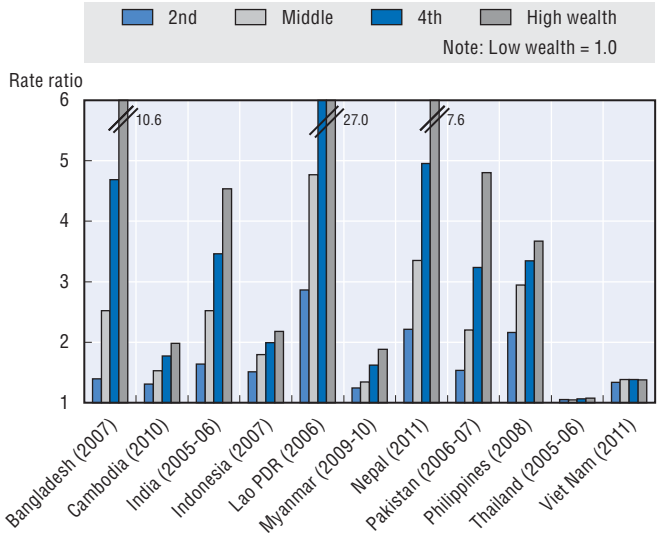
Source: *WHO Global Health Observatory Data Repository*.

3.5.2. Place of delivery



Source: Demographic and Health Survey (DHS) 2006-11; Li *et al.* (2011).

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



Source: Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS) 2006-2011.

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Chapter 4

Health expenditure and financing

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Much variation in health spending levels can be observed in Asia/Pacific countries and economies (Figure 4.1.1), ranging from Australia with a total health spending per capita of USD PPP 3 441 to Myanmar with spending of only USD PPP 34. The average OECD health spending per capita in 2010 was around five times that of the Asian economies (3 265 *versus* 616). In Asia, USD PPP 382 (62% of the total) are from public sources, as compared to USD PPP 2 354 (72.2%) reported in OECD countries.

On average, between 2000 and 2010, the growth rate in per capita health spending in real terms was 5.6% per year in Asia, higher than the 3.6% observed across OECD countries (Figure 4.1.2). The growth rate for China, Myanmar and Viet Nam was even more rapid – almost twice the average rate for the region. Two countries – Pakistan and Brunei Darussalam – reported a negative growth rate in health spending between 2000 and 2010.

In general, health expenditures as a share of GDP increase with per capita GDP. Figure 4.1.3 shows the relationship between per capita health expenditures and per capita GDP in 2010 (on a logarithmic scale). This underlines the existence of a relationship between income and health spending in Asia/Pacific, which parallels that seen among OECD economies as a whole. On the top-right of the graph there is a group that includes OECD countries, Singapore, and Brunei Darussalam. At the bottom-left of the graph there are all the other economies under study. Thailand, China and Malaysia are three middle-income, middle-spending countries. There is evidence of a transition for those countries towards high-income high-spending.

Definition and comparability

Total health expenditure is given by the sum of expenditure on all the core health care functions – that is total health care services, medical goods dispensed to outpatient, 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. For this reason, imports for final use are included and exports for final use are excluded.

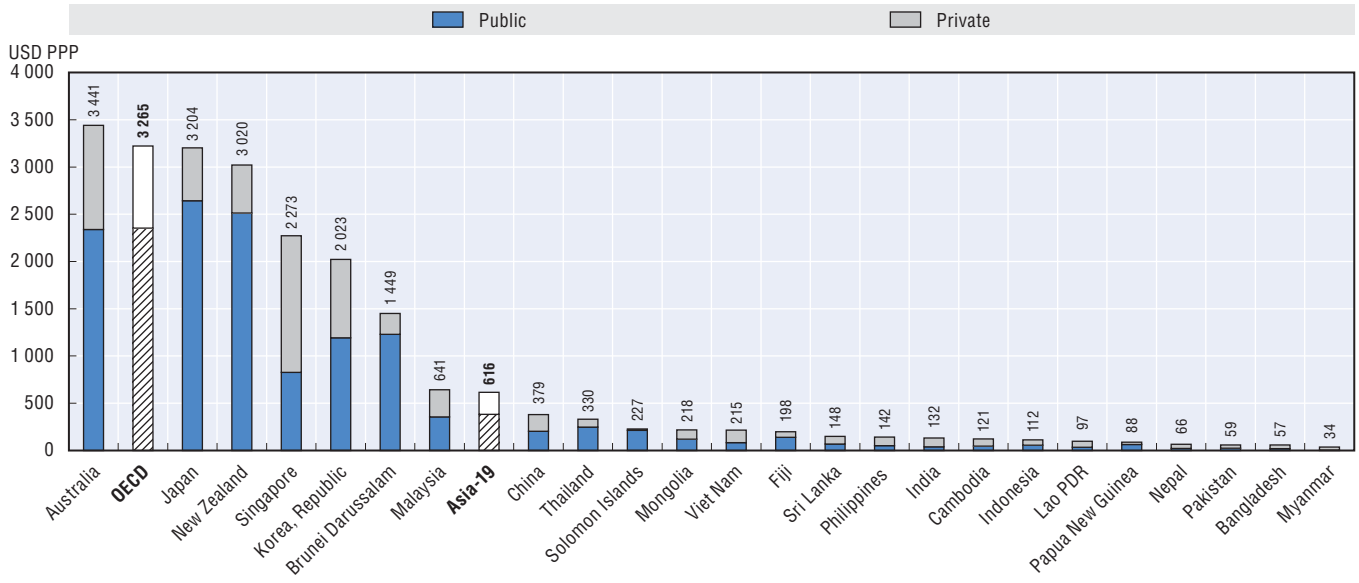
The economy-wide (GDP) PPPs are used as the most available and reliable conversion rates. These are based on a broad basket of goods and services, chosen to be representative of all economic activity. The use of economy-wide PPPs means that the resulting variations in health expenditure across countries might 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, at 2005 GDP price levels (from IMF).

The annual average growth rate was computed using a geometric growth rate formula:

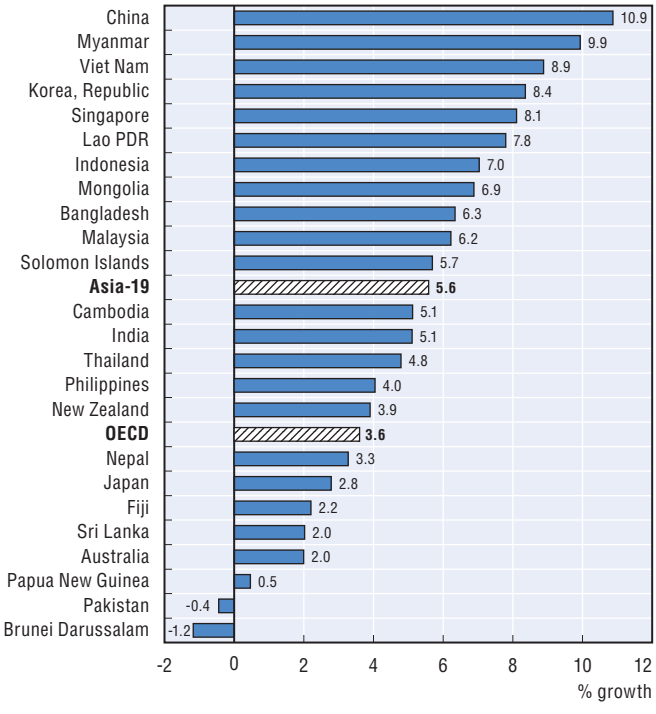
$$\sqrt[10]{\text{2010 value}/\text{2000 value}}$$

4.1.1. Total health expenditure per capita, public and private, 2010



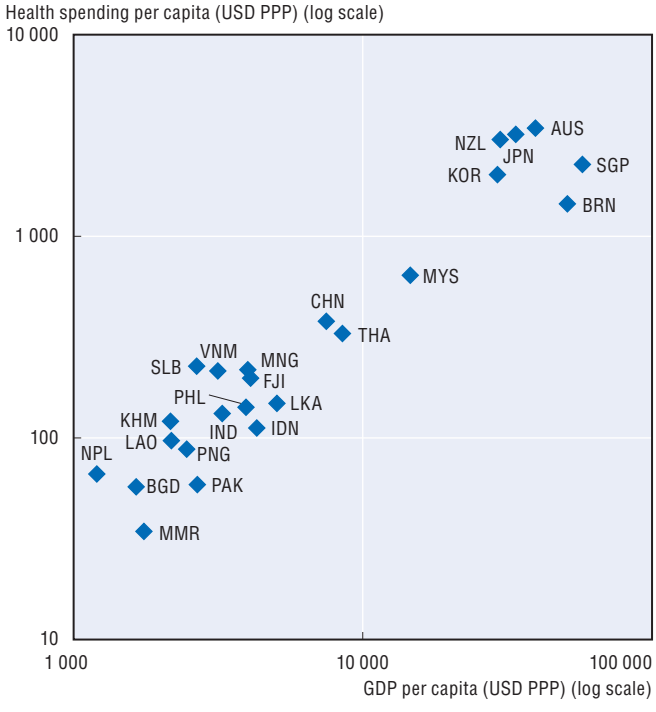
Source: *WHO Global Health Expenditure Database*; *OECD Health Data 2012*.

4.1.2. Annual average growth rate in real health spending per capita, 2000-10



Source: *WHO Global Health Expenditure Database*; *IMF World Economic Outlook*, April 2012; *OECD Health Data 2012*.

4.1.3. Total health expenditure per capita and GDP per capita, 2010



Source: *WHO Global Health Expenditure Database*.

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Health expenditure as a percentage of gross domestic product (GDP) in 2010 was 4.5% in the Asian region. This indicator varied from 2% in Myanmar to up to 10.1% in New Zealand (Figure 4.2.1). Generally, the richer a country, the more it spends on health as a percentage of GDP. The percentage of GDP allocated to health across OECD countries is – on average – twice that of the Asian countries and economies (9.5 *versus* 4.5).

Between 2000 and 2010, the share of GDP allocated to health increased between 0.4-0.7 percentage points in Indonesia, Thailand, the Philippines and China, while it declined by 0.4 percentage points in India (Figure 4.2.2). During the same period, Japan and the Republic of Korea reported an increase of 1.8 and 2.5 percentage points respectively. Note that between 2009 and 2010 the share of GDP allocated to health remained stable in the Philippines, Japan and Republic of Korea, while it showed a slight decline for China, India and Thailand, and a slight increase in Indonesia.

As in OECD countries, health spending growth in many Asia/Pacific countries and economies 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). All economies above the diagonal line report that health expenditure grows faster than income. This means that the share of health care expenditure in total expenditure continues to increase. In all economies below the line, the increase in health spending – on average – is lower than the increase in GDP. Hence the share of health spending in total spending declines. Only Brunei Darussalam and Pakistan showed a slight decline in the annual average growth rate in health spending per capita as compared to an increase in income per capita.

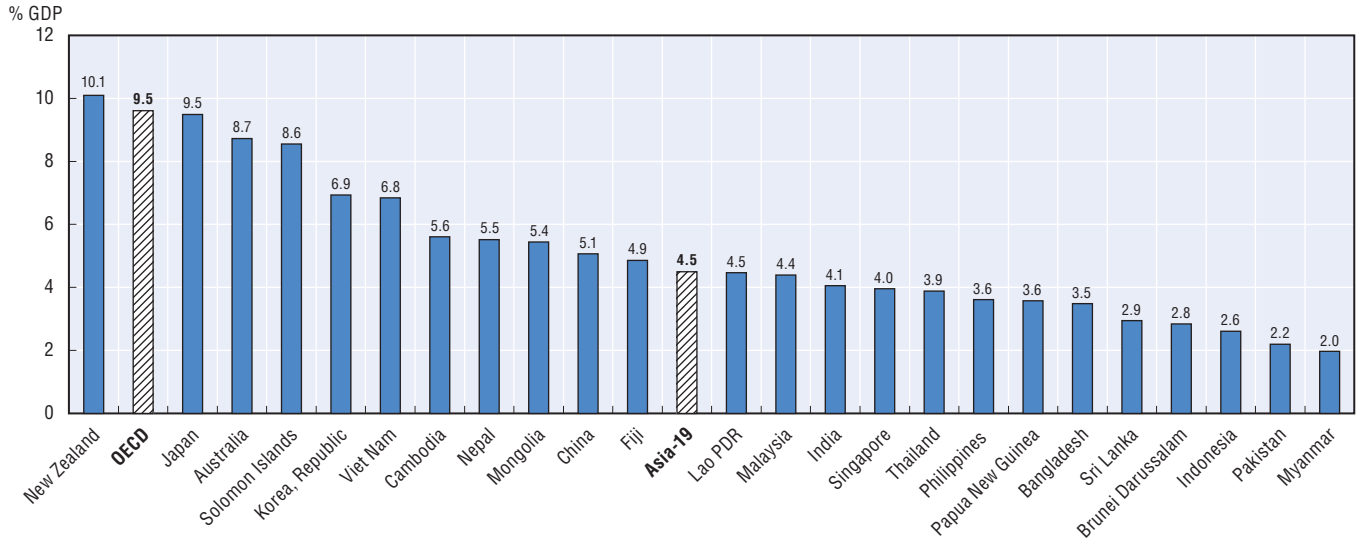
In China, health spending has grown at a higher rate than overall economic growth over the past ten years, a growth rate of about 11% per year per capita. In India, health spending growth has not kept up with the pace of economic growth (6% on average).

Definition and comparability

See Indicator 4.1 for the definition of total health expenditure and the formula and deflator used to compute annual average growth rate.

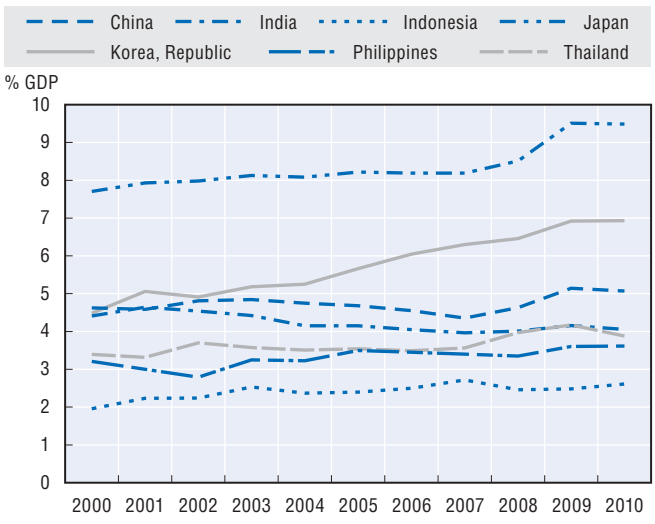
Gross domestic product (GDP) = final consumption + gross capital formation + net exports.

4.2.1. Total health expenditure as a share of GDP, 2010



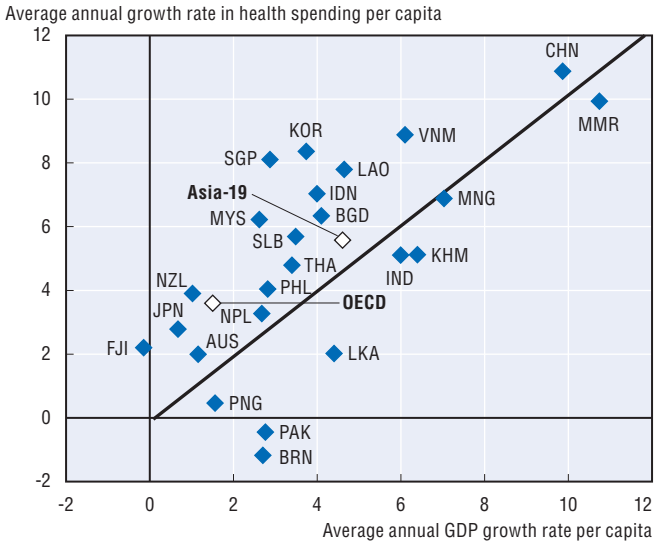
Source: *WHO Global Health Expenditure Database*; *OECD Health Data 2012*.

4.2.2. Total health expenditure as a share of GDP, 2000-10, selected countries



Source: *WHO Global Health Expenditure Database*.

4.2.3. Annual average growth rate in real health spending and GDP per capita, 2000-10



Source: *WHO Global Health Expenditure Database*; *IMF World Economic Outlook*, April 2012; *OECD Health Data 2012*.

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Figure 4.3.1 shows the change in the public share of health financing between 2000 and 2010. On average, the public share of health spending has slightly increased in the Asian countries and economies from 44.4% in 2000 to 46.6% in 2010. 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 72.2% of financing in 2010, similar to 2000. In Thailand, Brunei Darussalam, and the Solomon Islands, public financing accounted for more than 75% of all health expenditure, while it accounted for less than one third of total health spending in Lao PDR, Nepal and India. Myanmar reported only 12.2% of public health spending in total health spending.

The public share of health spending has increased significantly over the past ten years in Thailand, Pakistan, Cambodia and China (15 points of share or more), while it has decreased significantly in Singapore and Mongolia (–15 points or more).

Out-of-pocket payments represent more than 50% of total expenditure on health in Pakistan, Lao PDR, the Philippines, Singapore, India, Bangladesh and Viet Nam, while they reach 80% in Myanmar. This share is less than 20% in Fiji, Papua New Guinea, Brunei Darussalam, Thailand and Solomon Islands. On average, in Asian countries and economies the share of total health spending paid out-of-pocket has fallen by 6.7 percentage points since 2000, four times more than OECD countries (Figure 4.3.2).

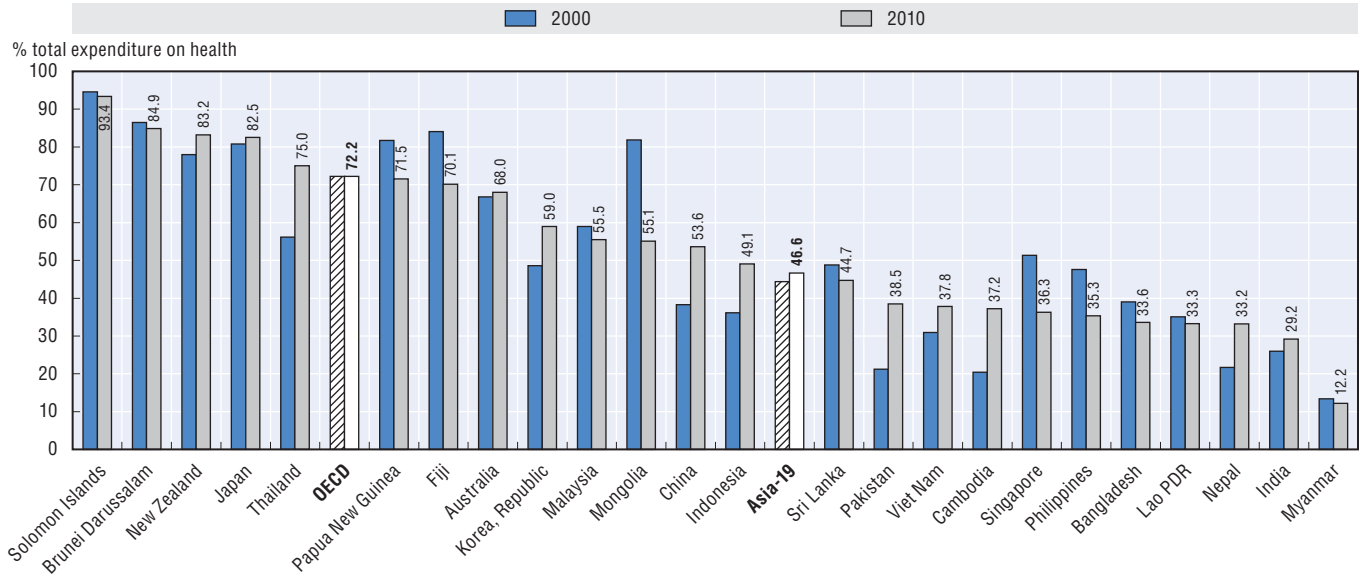
The trend, however, is quite diverse across the countries and economies. Eleven reported an increase, including the Philippines where the share of out-of-pocket spending increased by more than 10 percentage points between 2000 and 2010. Thirteen reported a decrease, including the Republic of Korea, Pakistan, Thailand, China, Nepal and Cambodia where the share fell by more than 10 percentage points over the same period.

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 Mongolia, Nepal, Viet Nam, Bangladesh, Myanmar and Brunei Darussalam, out-of-pocket health spending represents 90% or more of private health spending. As in OECD countries, private prepaid and risk pooling plans play a role in Thailand, Malaysia, the Philippines, Fiji and Singapore where their share in private health spending is 10% or higher. It should be noted that the private sector also comprises health expenditure by non-profit institutions serving households and corporations.

Definition and comparability

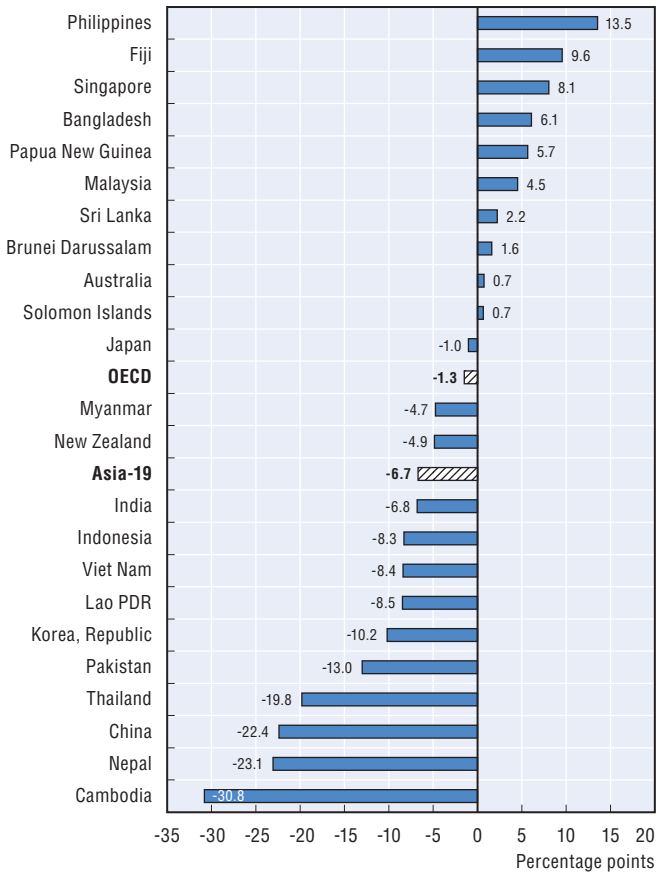
The financing classification used in the *System of Health Accounts 2011* provides a complete breakdown of health expenditure into public and private units incurring expenditure on health. Public financing includes general government expenditure and social security funds. Private sector comprises pre-paid and risk pooling plans, household out-of-pocket expenditure and non-profit institutions serving households and corporations. Out-of-pocket payments are expenditures borne directly by the patient. They include cost-sharing and, in certain countries, estimations of informal payments to health care providers.

4.3.1. Public share of total expenditure on health, 2000 and 2010



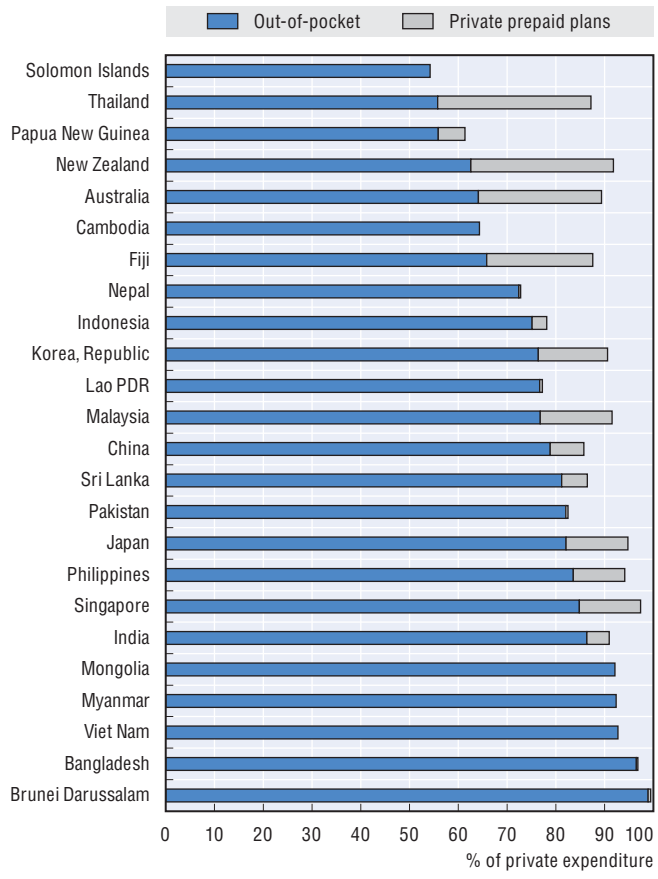
Source: *WHO Global Health Expenditure Database; OECD Health Data 2012.*

4.3.2. Change in out-of-pocket spending as a share of total expenditure on health, 2000-10



Source: *WHO Global Health Expenditure Database; OECD Health Data 2012.*

4.3.3. Out-of-pocket and private prepaid plans spending as a share of private expenditure, 2010



Source: *WHO Global Health Expenditure Database.*

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Per capita pharmaceutical spending varies greatly among Asia-Pacific countries and economies. In 2009, a large number reported spending below USD PPP 60 per capita, with Cambodia, Indonesia, Myanmar and Nepal spending less than 20 USD PPP per capita. On average, OECD countries spend more than three times as much as Asian countries and economies (487 *versus* USD PPP 136) (Figure 4.4.1).

Asian countries and economies report an average share of pharmaceutical spending in health that is twice the share of OECD countries (29.7% *versus* 15.6%) (Figure 4.4.2). This share varies from Papua New Guinea and Viet Nam which report the largest proportion of total health spending on pharmaceuticals (51.4% and 50.9%) to Malaysia and Solomon Islands which report the lowest (8.8% and 10.9%).

This partly reflects important differences in the dispensing of pharmaceutical goods 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. In this case, the amount that is distributed through retail channels and which is reported in SHA estimates as dispensing of medical goods is comparatively lower than in other economies.

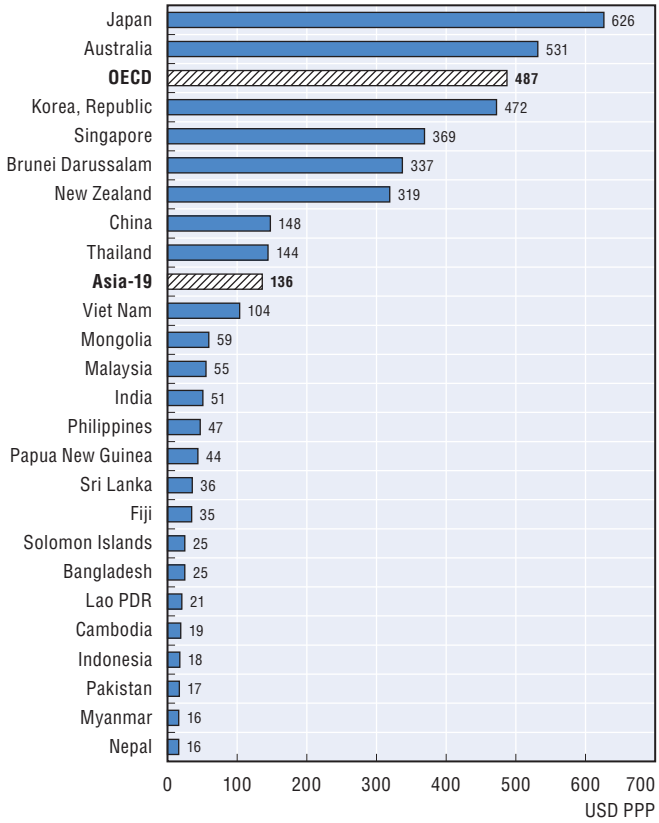
Asian countries and economies almost doubled the OECD countries annual average growth rate in real per capita pharmaceutical expenditure from 2000-09: 6.3% *versus* 3.5%. Importantly, pharmaceutical spending increased at a higher rate than total health spending in Asia (5.6%), while the opposite was observed in OECD countries where total health spending increased at a higher rate (4%) compared to pharmaceutical spending. Mongolia, Lao PDR, Myanmar and Viet Nam reported an annual average growth of more than 10%, while Pakistan is the only country that showed a decrease over the same period (–3.1%) (Figure 4.4.3). It is worth noting that Pakistan also had a contraction of the average annual growth rate in health spending/capita for 2000-10 as shown in Figures 4.1.2 and 4.2.3.

Definition and comparability

See Indicator 4.1 for the PPP conversion rate and the formula and deflator used to compute annual average growth rate.

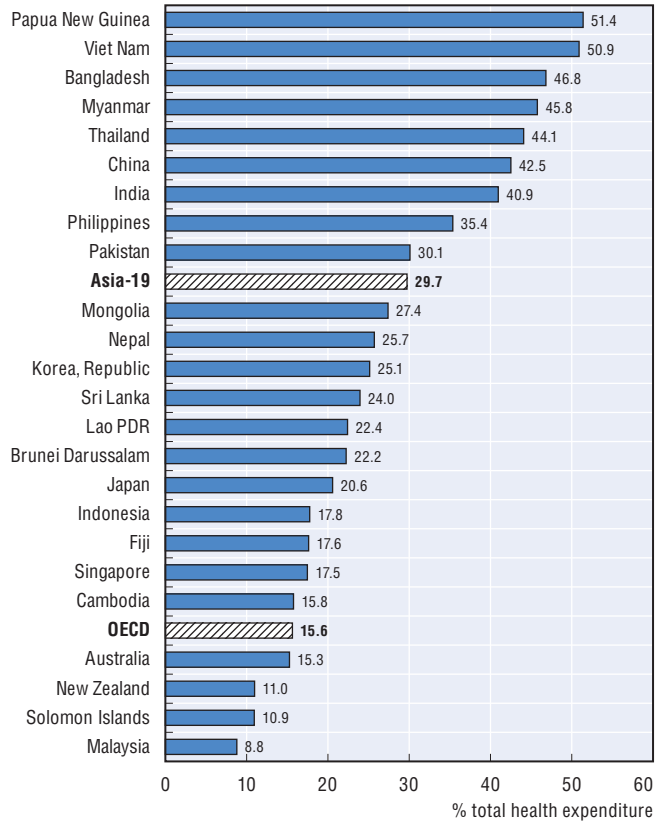
Pharmaceutical expenditures include pharmaceuticals, medicinal chemicals and botanical products used for health uses, prescribed or not. They comprise outlays during episodes of hospital care and out-patient clinics (*i.e.* intermediate consumption in national income and product account), as well as OTC sales.

4.4.1. Pharmaceutical expenditure per capita, 2009



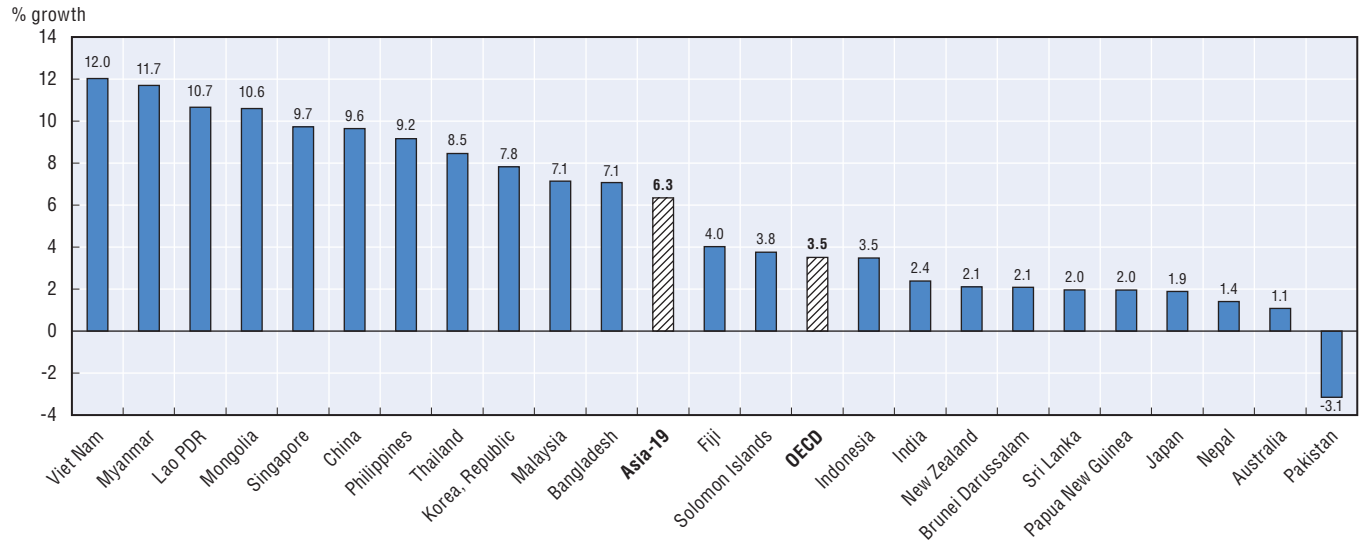
Source: *WHO Global Health Expenditure Database*; *OECD Health Data 2012*.

4.4.2. Pharmaceutical expenditure as a share of total health expenditure, 2009



Source: *WHO Global Health Expenditure Database*; *OECD Health Data 2012*.

4.4.3. Annual average growth rate in real per capita pharmaceutical expenditure, 2000-09



Source: *WHO Global Health Expenditure Database*; *OECD Health Data 2012*.

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Chapter 5

Quality of care

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The measurement and improvement of quality of care has become a crucial element of health system governance worldwide. Industrialised and transition countries alike are developing ways to measure quality of care and improve policies, with reliable measurement seen as a necessary first step in establishing the value of health care, and thus the performance of health care systems (OECD, 2010a). Hence, Health System Performance Assessment, as promoted by WHO, relies heavily on the assessment of quality of health care services. A chapter on quality of care has been published in OECD's *Health at a Glance* since 2007. The chapter on quality of care in this 2012 edition of *Health at a Glace: Asia/Pacific* is the first of its kind, and builds on the indicators used in OECD's Health Care Quality Indicator programme.

With the worldwide shift in morbidity and mortality from infectious to non-communicable diseases, the collection of statistics on health care in the Asia/Pacific region is also shifting in focus. In this chapter, quality indicators related to child vaccination (5.3) are reported by 27 countries, based on an information infrastructure on infectious diseases developed over past decades. This contrasts with information on 30 day-case fatality rates for AMI and stroke, which currently can only be reported by six countries (5.1). A similar situation exists for cancer care. Although mortality estimates from WHO are available for breast, cervical and colon cancer for 24 countries, data on screening rates for these cancers, as well as on five-year survival rates are not yet reported because of the lack of cancer registries in the majority of countries in the region (5.2). The indicator on mental health care (5.4) lacks comparative data, although developments in Malaysia are promising. Despite its shortcomings, the chapter illustrates that major steps have been made or are underway, and thus it is expected that in future editions of *Health at a Glance Asia/Pacific* the number of countries and indicators for which international comparable data are reported will increase.

Despite the scarcity of national statistics on quality of care, numerous policy initiatives to systematically evaluate and improve quality of care of health care services have been undertaken in a substantial number of countries in the region. Accreditation programmes for hospitals and the development of national quality improvement plans are the most common types of initiatives. Programmes to develop guidelines, standards and indicators as well as national initiatives to measure patient experiences and improve patient safety can also be identified. In Section 5.5, illustrations of quality of care initiatives are provided for Bangladesh, Cambodia, China, India, Japan, the Republic of Korea, Malaysia, the Philippines, Singapore and Sri Lanka. These country examples complement the data provided in the previous Sections and demonstrate increasing commitment to quality of care in the Asia/Pacific region.

Acute myocardial infarction (AMI) and stroke each account for around 3 million deaths a year in the Asia/Pacific region, being two of the major causes of death and disability (WHO, 2008a). Additionally, both are associated with significant health, social and non-financial costs, because of the persistent disabilities suffered by many survivors. Treatment for AMI and stroke has advanced greatly over the past decade. Until the 1990s, treatment focused on prevention of complications and rehabilitation. But following the great improvements in AMI survival rates that were achieved with thrombolysis (Gil *et al.*, 1999), clinical trials also demonstrated the clear benefits of thrombolytic treatment for ischemic stroke (*e.g.* Mori *et al.*, 1992). Dedicated cardiac care and stroke units offering timely and proactive therapy achieve better survival than conservative care (Seenan *et al.*, 2007), although studies have shown that a considerable number of patients fail to receive high-quality, evidence-based care (Eagle *et al.*, 2005).

For both AMI and stroke, the case-fatality rate is a useful measure of acute care quality. It reflects the processes of care, such as effective medical interventions, including early thrombolysis or treatment with aspirin when appropriate, and co-ordinated and timely transport of patients. For AMI, crude and age-sex standardised in-hospital case-fatality rates within 30 days of admission vary widely, with the lowest rates in Australia (3.2%) and New Zealand (3.2%) (Figure 5.1.1). Japan has the highest case-fatality rates (9.7%) although, at a population level, it has the lowest AMI mortality amongst OECD countries. Beyond the quality of care provided in hospitals, differences in hospital transfers, average length of stay, emergency retrieval times and average severity of AMI may influence reported 30 day-case fatality. The crude-case fatality rate for Malaysia (9.7%) is similar to that of Singapore (9.3%) and from a single centre in the Philippines (8.9%).

For ischemic stroke, the lowest case-fatality rates are seen in Korea (1.8%) and Japan (1.8%). Malaysia reports the highest crude rate (11.7%, Figure 5.1.2). Fatality rates for hemorrhagic stroke are about four times greater than for ischemic stroke, and countries that achieve better survival for one type of stroke also tend to do well for the other. Again, the lowest case-fatality rates for hemorrhagic stroke are seen in Japan (9.7%) and the Republic of Korea (9.8%), with Malaysia reporting the highest crude rate (27.3%, Figure 5.1.3). Given the initial steps of care for stroke patients are similar, this suggests that system-based factors plays a role in explaining the differences across countries. Other factors such as patterns of hospital transfers, average length of stay, emergency retrieval times and average severity of stroke may also influence the rates.

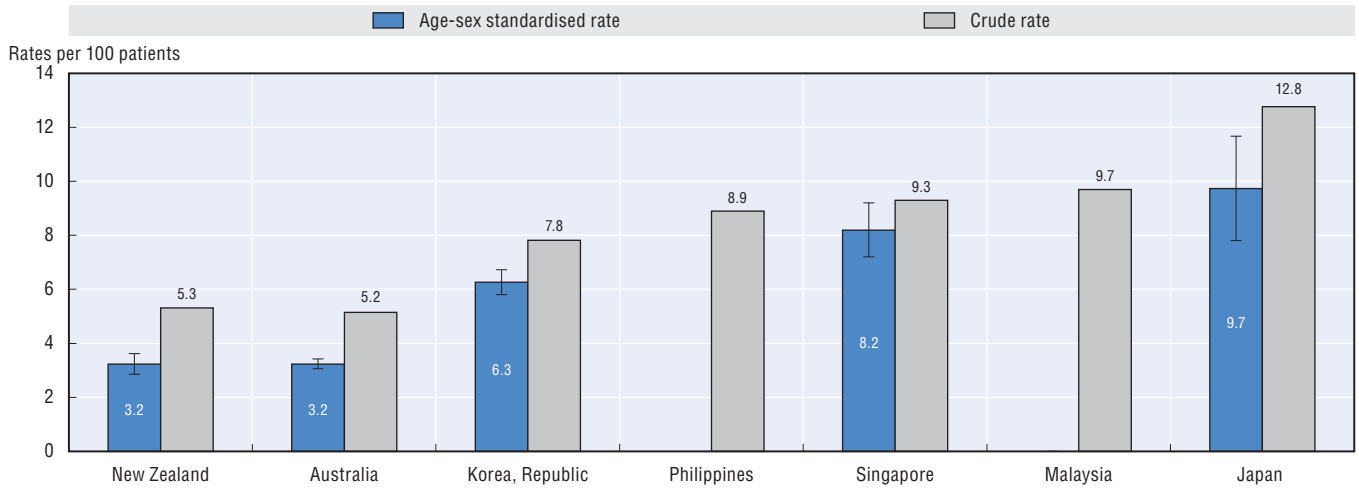
Patient-based data which follows patients in and out of hospital and across hospitals is a more robust (although administratively more complex) indicator for national monitoring and international comparison. This is because admission-based data may bias case-fatality rates downwards if unstable patients are transferred elsewhere, and the transfer is recorded as a live discharge. Currently, very few countries in the Asia/Pacific region are able to track patients, hence this indicator is not shown here.

Definitions and comparability

The in-hospital case-fatality rate following AMI, ischemic and hemorrhagic stroke is defined as the number of people who die within 30 days of being admitted (including same day admissions) to hospital. Ideally, rates would be based on individual patients, however not all countries have the ability to track patients in and out of hospital, across hospitals or even within the same hospital because they do not currently use a unique patient identifier. Therefore, since this indicator is based on unique hospital admissions and restricted to mortality within the same hospital, differences in practices in discharging and transferring patients may influence the findings.

Where available, both crude and age and sex standardised rates are presented. Standardised rates adjust for differences in age (45+ years) and sex ,and facilitate more meaningful international comparisons. Crude rates are likely to be more meaningful for internal consideration by individual countries.

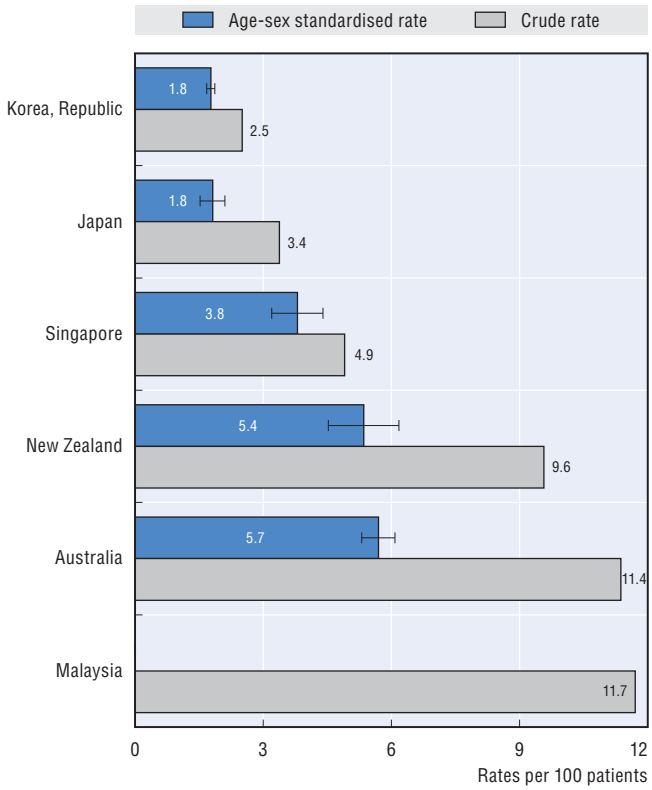
5.1.1. In-hospital case-fatality rates within 30 days after admission for AMI, 2009 (or nearest year)



Note: Rates age-sex standardised to 2005 OECD population (45+). 95% confidence intervals represented by ⊢⊣.

Source: *OECD Health Data 2012*; *National Cardiovascular Disease Database*, 1st Annual Report, 2006 for Malaysia.

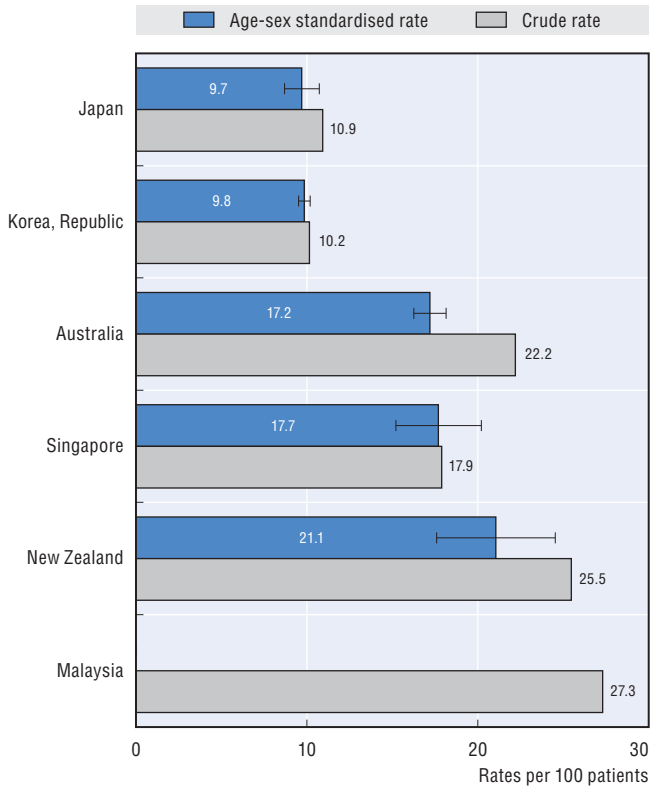
5.1.2. In-hospital case-fatality rates within 30 days after admission for *ischemic stroke*, 2009 (or nearest year)



Note: Rates age-sex standardised to 2005 OECD population (45+). 95% confidence intervals represented by ⊢⊣.

Source: *OECD Health Data 2012*; *National Cardiovascular Disease Database*, 1st Annual Report, 2006 for Malaysia.

5.1.3. In-hospital case-fatality rates within 30 days after admission for *hemorrhagic stroke*, 2009 (or nearest year)



Note: Rates age-sex standardised to 2005 OECD population (45+). 95% confidence intervals represented by ⊢⊣.

Source: *OECD Health Data 2012*; *National Cardiovascular Disease Database*, 1st Annual Report, 2006 for Malaysia.

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Breast cancer accounts for around 187 000 deaths per year in the Asia/Pacific region (WHO, 2008b). There are a number of factors that increase risk, such as age, family history, estrogen replacement therapy, alcohol use and others. The promotion of screening mammography and self-examination have led to the detection of the disease at earlier stages. Most OECD countries have adopted breast cancer screening programmes as the most effective way for detecting the disease, although periodicity and population target groups vary.

Cervical cancer, causing 138 000 deaths per year in the region, is also preventable and curable if detected early. The main cause of cervical cancer, which accounts for approximately 95% of all cases, is sexual exposure to the human papilloma virus, HPV (IARC Working Group, 1995; Franco *et al.*, 1999). Pap-smear and HPV DNA testing increases the probability of detecting premalignant lesions which can then be effectively treated. As for breast cancer, population-based cancer screening programmes have been adopted by most high-income countries, but again periodicity and target groups vary. In addition, primary prevention by prophylactic vaccines has been shown to be highly effective and offers new potential in controlling the disease (Shefer *et al.*, 2008; Koulova *et al.*, 2008).

Colorectal cancer is the third most commonly diagnosed form of cancer worldwide, after lung and breast cancers, and causes approximately 250 000 deaths per year in the region (WHO, 2008b). There are several factors that place certain individuals at increased risk including age, the presence of polyps, ulcerative colitis, a diet high in fat, and genetic background. The disease is rare in Asia, although in countries where people have adopted western diets, such as Japan, incidence is increasing (IARC, 2011). The secondary prevention of colorectal cancer by fecal occult blood, sigmoidoscopy or colonoscopy screening is increasingly being adopted (USPSTF, 2008).

Population-based *mortality rates* are one measure of health care quality. As well as reflecting the quality of cancer care, they also reflect improved diagnosis of early-stage cancers with a better prognosis, where screening is available and effective. They also reflect, however, changes in cancer *incidence*, which may have more to do with public health programmes and changing behaviours, than health care quality. A more sensitive marker of health care quality is *relative survival rates*. These estimate the proportion of patients who are still alive after a specified time period (commonly five years) compared to those still alive in the absence of the disease. They capture the excess mortality that can be attributed to the disease and reflect both how early the cancer was detected and the effectiveness of treatment. Another good measure of health care quality, for breast and cervical cancer, is screening coverage.

Few countries in the region are currently able to supply robust relative survival or screening rates, hence the indicators presented here focus on population mortality rates (WHO, 2008b). For the most recent estimations on breast cancer, Mongolia (2.0 per 100 000 females) and the Republic of Korea (3.0) have the lowest mortality rates, and New Zealand the highest (11.4; Figure 5.2.1). In most countries, estimated mortality rates decreased between 2004 and 2008, which may suggest improvements in the quality of care. Mongolia's low mortality reflects one of the lowest incidence rates in the region, at 8.0 cases per 100 000 females per year compared to 37.0 in Malaysia (Ferlay *et al.*, 2010).

For cervical cancer, Australia (1.0 per 100 000) and New Zealand (1.2) are estimated to have the lowest mortality rates, with Fiji (10.4) and Cambodia (10.9) the highest (Figure 5.2.2). Again, as well as reflecting differences in the effectiveness of population screening programmes and access to high quality treatment, these figures also reflect local incidence rates. Fiji has a relatively high incidence of cervical cancer (31.4 cases per 100 000 females per year), as does Cambodia (27.4), compared to Australia (4.9) (Ferlay *et al.*, 2010).

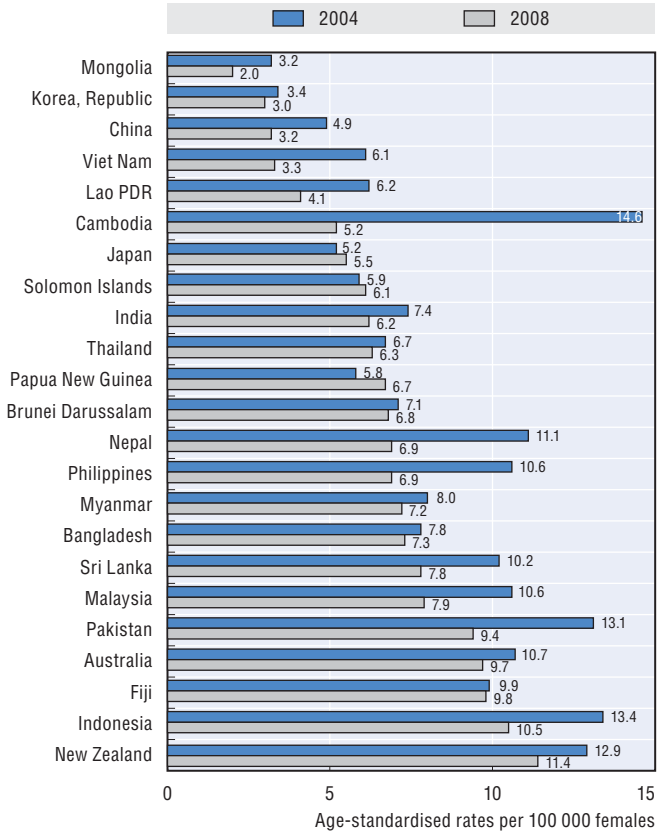
For colorectal cancer, India has the lowest (3.2 per 100 000 population) and New Zealand the highest mortality rate (20.4, Figure 5.2.3). India has a relatively low incidence of colorectal cancer (3.9 cases per 100 000 population per year) compared to New Zealand (40.5 cases; Ferlay *et al.*, 2008). As for the other cancers, decreasing mortality rates in most countries between 2004 and 2008 suggest improvements in the quality of care.

Definitions and comparability

Deaths from all cancers are classified to ICD-10 codes C00-C97, lung cancer to C32-C34, breast cancer to C50 and prostate cancer to C61. Mortality rates are based on estimated numbers of deaths in a country in a year divided by the size of the corresponding population. Incidence rates refer to the number of new cases of a cancer in a given population per year. Both rates are age-standardised.

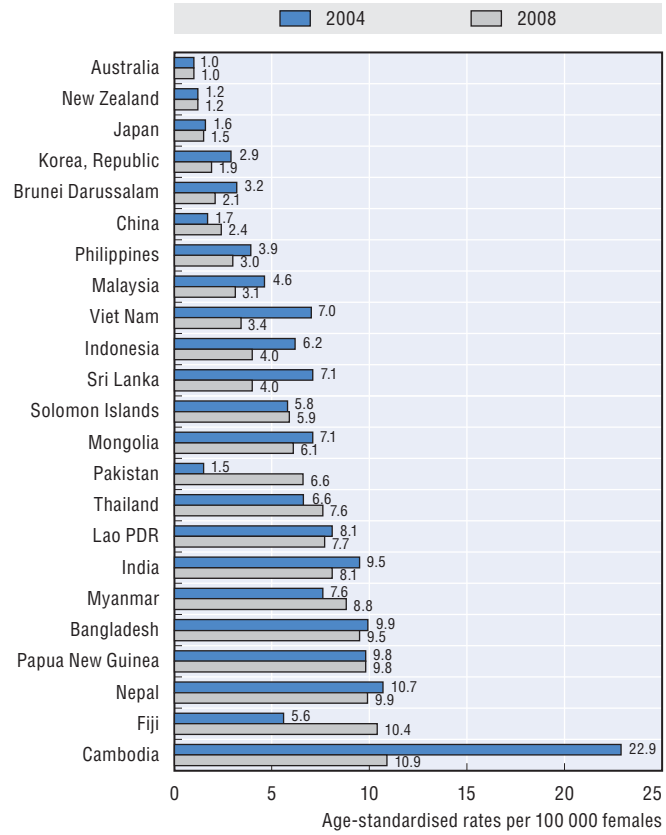
Mortality data are taken from the WHO Global Burden of Disease estimates for 2004 and 2008, available at *www.who.int/healthinfo/global_burden_disease/estimates_country/en/index.html*. These represent WHO estimates, based on the evidence available to it, rather than the official estimates of member states. For the Republic of Korea for example, WHO estimates are significantly higher than official national estimates.

5.2.1. Breast cancer mortality, females, 2004 and 2008



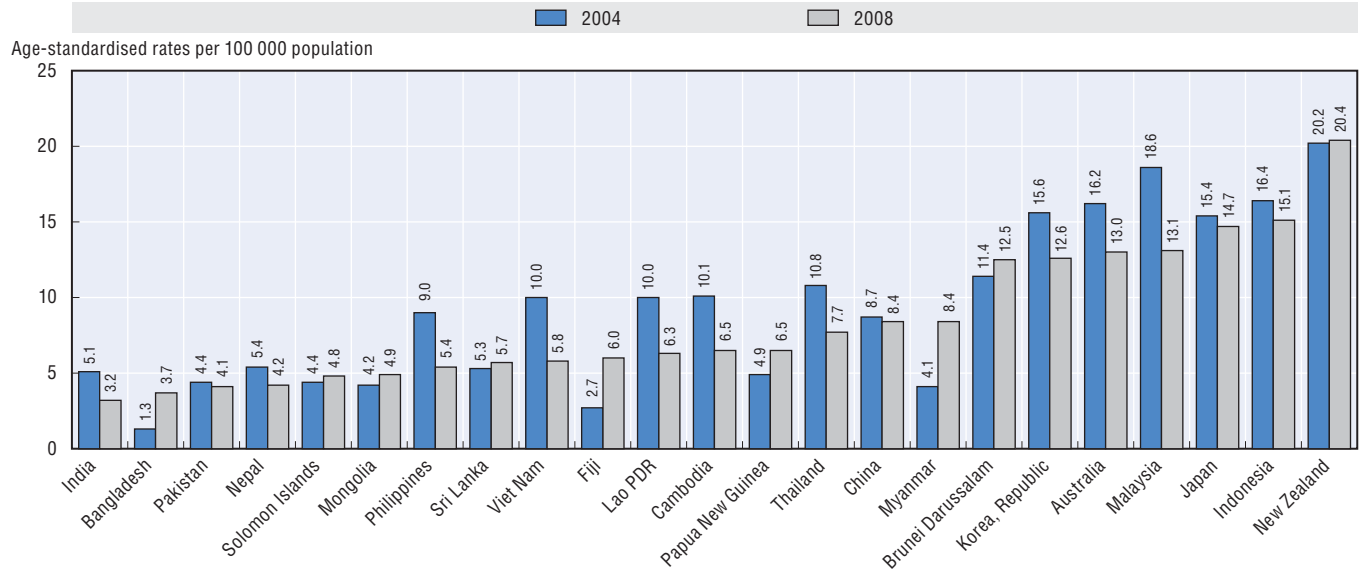
Source: WHO Global Burden of Disease, 2011.

5.2.2. Cervical cancer mortality, females, 2004 and 2008



Source: WHO Global Burden of Disease, 2011.

5.2.3. Colorectal cancer mortality, 2004 and 2008



Source: WHO Global Burden of Disease, 2011.

StatLink http://dx.doi.org/10.1787/888932723418

Childhood vaccination continues to be one of the most cost-effective health policy interventions. Nearly all countries or, in some cases, sub-national jurisdictions have established vaccination programmes based on their interpretation of the risks and benefits of each vaccine. Coverage of these programmes can be considered as a quality of care indicator. Pertussis, measles and hepatitis B are taken here as examples as they represent, in timing and frequency of vaccination, the full spectrum of organisational challenges related to childhood vaccination.

Vaccination against pertussis (often administered in combination with vaccination against diphtheria and tetanus) and measles is part of almost all programmes, and reviews of the evidence supporting the efficacy of vaccines against these diseases have concluded that they are safe and highly effective.

A vaccination for hepatitis B has been available since 1982 and is considered to be 95% effective in preventing infection and its chronic consequences, such as cirrhosis and liver cancer. In 2004, it was estimated that over 350 million people were chronically infected with the hepatitis B virus worldwide and at risk of serious illness and death (WHO, 2009b). In 2007, more than 170 countries had adopted the WHO recommendation to incorporate hepatitis B vaccine as an integral part of their national infant immunisation programme. In countries with low levels of hepatitis B (such as Australia and New Zealand), WHO indicates that routine hepatitis B vaccination should still be given high priority, since a high proportion of chronic infections are acquired during early childhood (WHO, 2004).

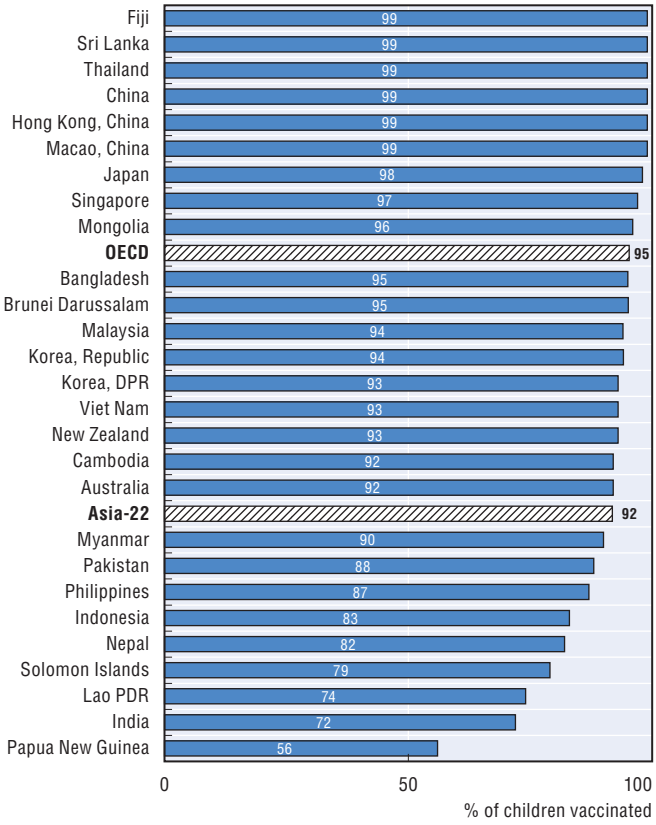
Figures 5.3.1 and 5.2.3 show that the overall vaccination of children against measles and pertussis (including diphtheria and tetanus) is high in most Asia/Pacific countries and economies. On average, more than 90% of children aged around one year receive the recommended measles and pertussis vaccination, and rates for most countries are above 75%, with the exception of India, the Lao PDR, Papua New Guinea and the Solomon Islands. Figure 5.3.3 shows that the average percentage of children aged one who are vaccinated for hepatitis B across countries is slightly lower than for measles and pertussis, at 89%. Again, rates for most countries are above 75%, with the exception of India, the Lao PDR, and Papua New Guinea.

Although vaccination rates have plateaued at a high level in many countries in the Asia/Pacific region, some countries with historically low rates continue to make substantial progress. In 2007, Hepatitis B immunisation in India was only 6%, and measles immunisation in the Lao PDR only 40% of the target groups, for example (WHO, 2012e). Nevertheless some countries such as Papua New Guinea still show slow progress in vaccination rates.

Definition and comparability

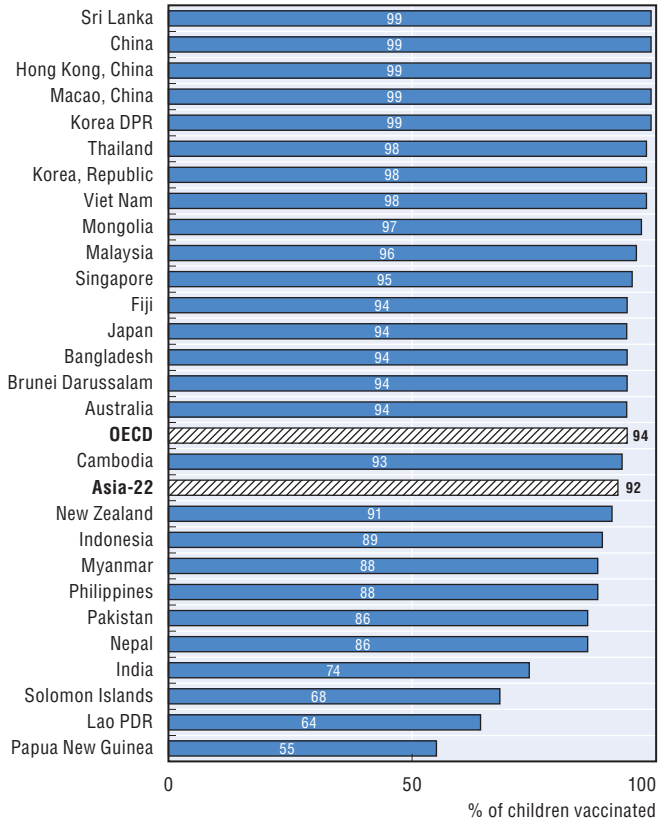
Vaccination rates reflect the percentage of children at either age one or two that receives the respective vaccination in the recommended timeframe. Childhood vaccination policies differ slightly across countries. Thus, these indicators are based on the actual policy in a given country. Some countries administer combination vaccines (*e.g.* DTP for diphtheria, tetanus and pertussis) while others administer the vaccinations separately. Some countries ascertain vaccinations based on surveys and others based on encounter data, which may influence the results.

5.3.1. Vaccination rates for diphtheria, tetanus and pertussis (DTP3), children aged around 1, 2010



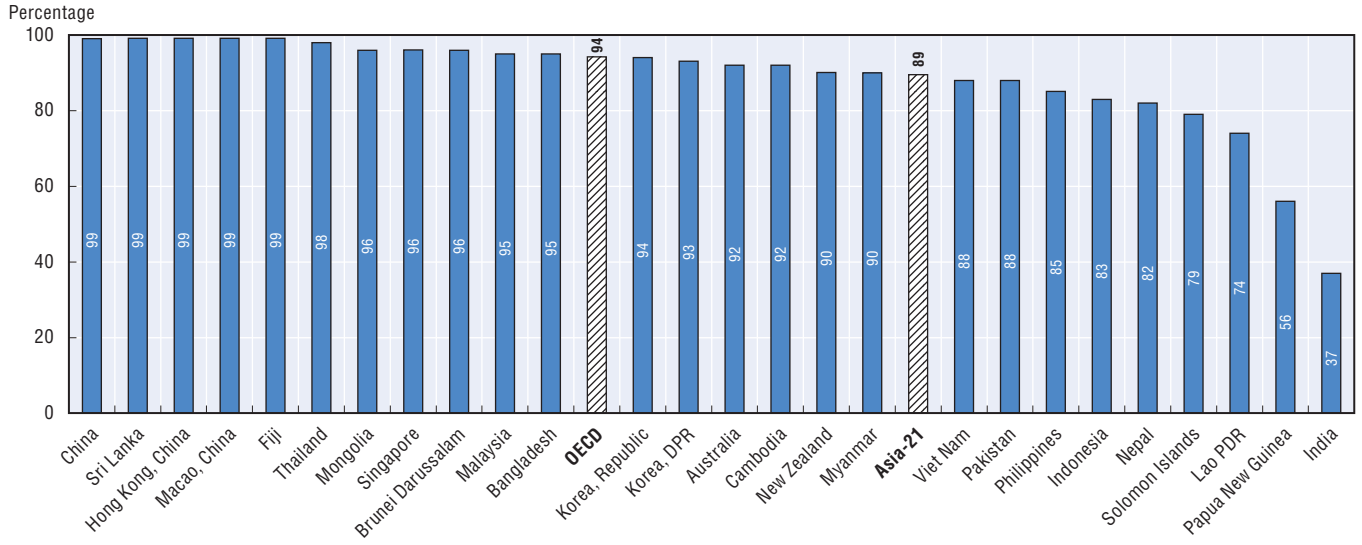
Source: WHO Global Health Observatory, 2012.

5.3.2. Vaccination rates for measles (MCV), children aged around 1, 2010



Source: WHO Global Health Observatory, 2012.

5.3.3. Vaccination rates for hepatitis B (Hep3), children aged around 1, 2010



Source: WHO Global Health Observatory, 2012.

StatLink http://dx.doi.org/10.1787/888932723437

The burden of mental illness is substantial, both in the Asia/Pacific region and beyond. According to WHO's most recent estimates (WHO, 2008b), depression is the second leading cause of disease in the Western Pacific region, accounting for 15.2 million lost disability adjusted life years (DALYs) per year, and second only to stroke. In the Southeast Asia region, depression is the fourth leading cause of diseases, accounting for 21.1 million DALYs per year. A broader sweep which includes unipolar and bipolar affective disorders, schizophrenia, alcohol and drug use disorders, post-traumatic stress disorder, obsessive-compulsive disorder and panic disorder totals 36.6 million DALYs per year in the Western Pacific region and 39.5 million in the Southeast Asia region.

Quality is as important an objective in mental care as in other areas of health. Given that the mentally unwell patient may not always be competent to determine his or her choices regarding treatment, the dimensions of patient centredness and safety become acutely important. But mental health care quality can be hard to measure. Data are typically sparse and, despite efforts to systematise diagnosis, sociocultural differences may complicate the comparability of internationally collected metrics. Even an apparently robust indicator such as life expectancy (LE) becomes problematic in the context of mental illness. LE is shorter in individuals with severe mental illness for several reasons, including higher rates of undiagnosed or undertreated physical illness and poorer social and economic environments (Brown, 1997). Hence, it may be that mental health services have a limited role in determining the general health of these individuals, and that LE has limited utility as an indicator of the quality of mental health care.

Despite these challenges, the OECD is a focal point for international work on exploring mental health care quality indicators. *30-day readmission rates* after an admission for severe mental illness has been agreed as a robust, useful and feasible indicator, since patients are not usually readmitted to hospital within a short interval if given appropriate care whilst in hospital and co-ordinated follow-up at discharge (Hermann, 2006). Hence, rate of unplanned re-admissions may reflect the quality of several dimensions of the mental health system.

The indicators entail the need to identify an initial admission in which the patient is recognised as suffering the condition and apply a unique patient identifier, so that readmissions can be identified. This is challenging in itself. Furthermore, the absence of unique patient identifiers in many countries does not allow the tracking of patients across hospitals. Rates are often biased downwards, therefore, as re-admissions to a different hospital cannot be observed.

In addition, differences in how mental illness is treated means that re-admission rates need to be interpreted with care. Some countries, for example, use interval care protocols to place unstable patients into hospital care for short periods and/or are more proactive in identifying patients in need of care through outreach teams, possibly leading to high re-admissions. Unplanned re-admission is only one measure of the quality and performance of mental health care systems, and further indicators in domains such as treatment, care continuity, co-ordination and outcomes are needed to contribute to a better and more complete understanding of the performance of mental health care systems across countries.

Hence, collecting and interpreting comparable data in the Asia/Pacific setting raises significant challenges. Some countries are beginning to produce these data, whether at national or facility level, demonstrating the commitment to measuring and improving the quality of mental health care services in the region. For example, two studies from a teaching hospital in Malaysia (treating mainly Chinese descendants, urbanised and middle income patients) examined six-month readmission rate amongst all psychiatric patients (except those admitted for drug trials or for electroconvulsive therapy) and found that readmission rates after six months were between 16.8% and 32.2%, between 2006 and 2008 (Siddiq, 2009; Ng *et al.*, 2012). The factors most associated with risk of readmission were severity of illness and poor compliance with medication, implying that measures to improve compliance to medication are required to reduce psychiatric readmission.

In the Republic of Korea, unplanned 30-day readmission rates are estimated at 10.3% for bipolar disorder and 12.5% for schizophrenia in 2007 (Paik, 2012). In Japan,

the 30-day readmission rate for schizophrenia was 4.0-5.3% in data from 1995-96 (Mayahara, 2002). In Australia, 28-day readmission rate (planned and unplanned, 2008-09) after admission for any psychiatric illness varied between 5 and 16%, depending on the jurisdiction (COAG, 2012).

Looking at the wider OECD data currently available, re-admission rates for schizophrenia vary markedly, with Norway, Poland and Sweden at the higher end (24.4-28.9%), and the Slovak Republic (4.5%) and the United Kingdom (8.1%) at the lower end. The pattern of re-admission rates for bipolar disorders is similar, ranging from 22.6-30.5% in Norway, Poland and Sweden to 4.9% in the Slovak Republic (OECD, 2011). The rates reported from the Asia/Pacific area are broadly similar, an encouraging sign that further regional efforts to collect these data will support international efforts to benchmark and improve the quality of care for those suffering from mental illness.

Definitions and comparability

In OECD work, the indicator "30-day readmission rates after an admission for severe mental illness" is defined as the total number of unplanned re-admissions in a calendar year to any hospital for patients (age 15+) discharged at least once in the referred year with a principal diagnosis (or first two listed secondary diagnoses) of severe mental illness, divided by the total number of discharged patients meeting the same age/diagnosis critiera. Two indicators are defined, for schizophrenia and bipolar disorder separately. Readmission for any mental health condition is considered as a re-admission and, since few administrative databases can distinguish between unplanned and planned (foreseen as part of the treatment plan) readmissions, any re-admission is considered unplanned.

Bangladesh

Since 2009, Bangladesh has been implementing a broad array of digital services to improve the accessibility and quality of its health care. The Ministry of Health and Family Welfare now runs a digital *District Health Information System* connecting all health facilities, down to sub-district level (about 800 in total). Facilities can upload data directly to the repository, allowing tables and charts of service data or population health status to be quickly created at facility, regional or national level. Comparison of data between time periods and geographic locations is possible, supporting evidence-based policy making. Expansion continues down to grassroots level, with a target to reach all rural 18 000 community clinics by end of 2013.

Bangladesh is also creating *electronic health records*, with every citizen being given a unique identifier. Data collection is already complete for rural areas (representing 70% of the country's population) and patient records should be available for use by health workers by the middle of 2013. Already, 5 000 tablet computers have been given to community staff and six hospitals have been networked so they can start using the eHealth system; the aim is to connect all health workers and hospitals by end of 2016.

New technologies are also expanding accessibility. Every district and sub-district hospital in Bangladesh now rosters a doctor to provide free medical advice to citizens over the telephone. Mobile phones are also being used to improve the quality of antenatal care. A pregnancy care advice service allows any woman to register her pregnancy by sending an SMS (text message), stating the date of her last menstrual period. On return, she receives her expected date of delivery and thereafter periodic SMS containing pregnancy care advice appropriate for each trimester.

Patients in eight district hospitals can now receive consultations with specialists in tertiary hospitals via video links, with the aim to connect all hospitals to the telemedicine network by the end of 2016. Eventually, the aim is to offer a telemedicine service to all community clinics, providing not just consultations but also health education to local community. Video monitoring and fingerprint biometric systems have also been successfully used to help improve workplace attendance of health service employees, particularly in remote health facilities.

Digitalisation is supporting accountability and a more patient-centred health service. Patients, relatives and visitors in 800 public hospitals are now given information about how to send an SMS to report unsatisfactory care. Texts arrive at a central clearing house where staff call the patient to better understand the complaint; they then talk to the appropriate local authorities to implement solutions to the problem.

Cambodia

In 2010, the Ministry of Health in Cambodia published its *Master Plan for Quality Improvement in Health*, establishing a set of minimum standards for quality health care. The plan aims to support a responsive health care system that continuously improves health services for all Cambodians, through a number of quality assurance and quality improvement tools.

First, the *Health Facility Assessment Tool* accredits hospitals and health centres as meeting a set of quality criteria. The tool was initially developed in 2007 and revised and updated in 2012, as part of the *Master Plan*. Regular facility surveys are conducted to ensure that appropriate medical supplies, basic equipment and infrastructure are in place, according to guidelines set out for a Minimum Package of Activities and/or an augmented Complementary Package of Activities. About 80 referral hospitals in the country are assessed annually through this tool; about 50% of the 1 004 health centres in the country were assessed from 2008 through 2011.

Second, the Ministry of Health is developing 163 *clinical practice guidelines* for common medical conditions. Guided by these, a *clinical pathways manual* is also underway which aims provide a template for patients and health care providers to pursue evidence-based best practice. The *pathways* are task-orientated care plans which detail essential steps in the care of patients with a specific clinical problem and set out expected outcomes, allowing modification to fit local circumstances.

Third, a *Health Management Information System Quality Score Card* has been implemented with the assistance of WHO. The *Score Card* aims to support the information infrastructure which underlies quality assurance efforts. Amongst other things, it assesses the extent and depth of data reporting, provides checks of internal data consistency (by cross-checking antenatal care with immunisation rates, for example), and compares indicator definitions and overall figures with other countries. While nearly 100% of the health facilities are reporting and show a good internal consistency, the *Score Card* has highlighted that some indicator definitions are based on 2008 data and may be outdated.

Fourth, with WHO assistance, the Ministry of Health developed and endorsed national policy, five year strategic plan, technical guideline and training manuals for Infection Prevention and Control. A cohort of trainers are providing on the job training for healthcare workers (HCW) in referral hospitals. Hand hygiene campaigns for HCW take place since 2010. An IPC assessment tool in health care facilities covering organisational structure, technical knowhow, human resources, surveillance, laboratory support, monitoring and evaluation, and public health links is developed and being used to perform baseline assessment of provincial hospitals. The assessment will be repeated next year and the MoH will provide a prize to the most improved hospital. With WHO technical support, the Ministryof Health has also set up a limited health care associated infection surveillance in one provincial hospital.

Last, a *Client Satisfaction Tool* surveying user experiences was developed and a baseline assessment conducted in 2011. The outcome of the assessment suggested many areas for improvement from waiting times, to costing of services and information provision. The survey will be repeated at regular intervals.

Further information is available from the Ministry of Health's National Strategy Plan for Infection Prevention and Control, 2011-15; Master Plan for Quality Improvement in Health, 2010; and Referral Hospital Assessment Tool, 2007. *(http://hiscambodia.org/public/fileupload/Referral_Hospital_Assessment_Tool_FINAL_ENGLISH_March_26_2007.doc; www.hciproject.org/sites/default/files/MOH_Cambodia_IPC_guidelines_for_health_facilities_2010.pdf)*.

China

In the early 2000s, China was aware of a number of shortcomings in its health care system, including difficulties in monitoring quality of care and holding health facilities accountable (given multiple, fragmented health care providers); adverse incentives to over-prescribe drugs and diagnostic tests; and a lack of standardised qualifications for health care staff. Together, these meant that health care quality and patient centredness were not always first and foremost in the delivery of health care.

In response to this, 2005 was declared a *Year of Hospital Management Reform*. Several initiatives began, each aiming to improve the quality of Chinese health care. The government issued guidelines restricting prescription of drugs to seven days (or three days, in the case of emergency care), and the number of diagnostic tests. It also introduced performance-related pay, where physician salaries became linked to the provision of high quality care, measured partly by an appropriate reduction in drugs prescription and tests, but also by patient satisfaction reports.

A major initiative was development of the *Chinese Hospital Quality Indicator System* (CHQIS), a joint undertaking by the National Institute of Hospital Administration and the Chinese Ministry of Health. This computerised data collection and analysis system looks at deaths, readmissions, adverse events, length of stay, costs and other parameters in each hospital, in an effort to support hospital management, standardise care, improve quality assurance and compare performance with international standards. In total CHQIS comprises 730 single indicators and 2 610 complex indicators.

Since 2006, CHQIS has been applied to most of the tertiary hospitals in Beijing, and many other hospitals in Shanghai and in Guangdong province. It has had a wide-ranging impact, contributing to the promotion of effective and efficient hospital management, improving the quality of hospital services and ultimately improving patient services and patient satisfaction (Ministry of Heath, China, 2011). CHQIS has also provided the platform for the development of several integrated regional health care systems. These aim to provide more coherent health care delivery through integrated diagnostic and IT systems, referral systems and electronic patient records. Not only is it hoped that an improved information flow will lead to better decision-making and resource allocation, but also that a more integrated health service will lead to a better patient experience and greater patient satisfaction.

Further information on CHQIS (in Chinese) is available from: *www.moh.gov.cn/publicfiles/business/cmsresources/mohyzs/cmsrsdocument/doc11072.doc*.

India

One of the most important health care quality initiatives recently started by the Quality Council of India is the *National Accreditation Board for Hospitals and Healthcare Providers* (NABH). The board aims to put national health care accreditation on a par with global benchmarks, focusing on patient safety alongside quality of care. The standards used are accredited by ISQua (International Society for Quality in Healthcare) and are both patient centred (covering elements such as access and continuity of care or patient rights and education), and oriented toward organisational efficiency (covering elements such as facility management and safety or information management systems). Moreover, the standards go beyond monitoring to call for corrective action and continuous improvement, embedding a culture of quality across the health care system. To date, about 150 hospitals and 45 blood banks have been accredited by NABH, both public and private. Once accredited, the NABH continues monitoring each hospital and, once a month by random draw, one accredited hospital undergoes an unscheduled inspection.

Successful reforms depend upon implementation at local level. As an example, the state of Gujarat focused initially on reproductive and child health care services, setting set up *Quality Assurance Cells* which led the training of 2 294 clinicians and public health managers, with multiple facilities and field activities (such as family planning camps) assessed. Accreditation was subsequently rolled out to all public health care facilities, including medical colleges, district hospitals, community health and primary care centres, blood banks, laboratories, psychiatric and dental hospitals. Currently 21 health facilities have been accredited, an additional 82 facilities are in the process of accreditation and accreditation of an additional 172 facilities is planned during 2012-17.

As well as implementation of the NABH accreditation programme, other health care quality initiatives in Gujurat include:

- nomination of *District Quality Assurance Officers*, to coordinate and promote continuous health care quality improvement at facility level;
- also at facility level, supporting the work of *health care quality committees*, covering topics such as quality assurance, medical audit, hospital infection control, drugs and therapeutics, grievances and ethics;
- *defining, monitoring and evaluating quality indicators*, including measures of patient and employee satisfaction;
- *study missions* to the United States to learn about application of quality management techniques in health care.

Finally, India illustrates how the policy context and measurement of health care quality in a low-income country is likely to differ from OECD countries. The *Chiranjeevi Yojana* or "plan for a long life" (for mothers and children) programme introduced to Gujurat seeks to ensure skilled attendance at delivery for poor women. The scheme was launched in 2005 in five districts facing the highest infant mortality and maternal mortality. The state pays private gynaecologists a fee to attend each delivery, with additional sums given to the patient for transportation costs and to an accompanying person for loss of wages. From January 2006 to March 2008, nearly 100 000 deliveries were performed under the scheme. Hence, although *skilled attendance at delivery* may not be a useful measure of health care quality in high income countries, it remains a deeply relevant indicator in other settings.

Japan

Quality indicators have been discussed in Japan since the 1990s, but use has so far been limited. In 2010, however, the Ministry of Health, Labour and Welfare (MHLW) provided funds for the measurement and publication of *quality indicators* (QI) in hospitals, one of the first concrete examples of the utilisation of such measures at national level. Six hospital associations participated in the first three years, facilitating QI measurements and comparisons amongst multiple hospitals, which led doctors and health care professionals to become more receptive toward QIs. The quality measures employed in these projects have been selected based on research evidence, and have much in common with those currently used in other OECD countries. Many of these indicators measure the processes of health care, such as the use of aspirin in acute myocardial infarction, perioperative prophylactic antibiotics, and early initiation of rehabilitation after stroke. The risk-stratified incidence of falls and decubitus ulcers were also adopted, particularly for nursing care and long-term care. The standardisation of measures and data sets, as well as their usability for patients and consumers, are themes to be resolved in near future.

Electronic patient records (EPR) are expected to be the primary data source for quality measure projects. In 2003, the Japanese government began hospital prospective payments based on the case-mix classification system known as Diagnosis Procedure Combination, a system which now covers approximately 1 500 hospitals. Hospitals have to prepare a standardised data set comprising key clinical data and detailed process data. In 1995, a QI project involving several voluntary hospitals in Japan was started by constructing a common data set, and quality and performance indicators were compared. This project has continued to expand to over 300 participant hospitals, and produces out-put over a wide range of indicators that include risk-adjusted outcome measurements.

Another move towards standardised QI measurement is the use of the *National Database of Health Insurance Claims*. This health insurance claims database contains the detailed process items at the regional and national levels, and one may expect considerable advances in measuring QIs. A good example of the application of this data to QI measurements already exists at a prefectural level: the analysis of claims data showed substantial inter-institutional variations in the quality indicator of inhaled steroid use for asthma patients, as well as its significant association with subspecialty expertise. This kind of claims data has also allowed the investigation of population-based regional variation in QIs.

The development of data infrastructure has been an important driver to push forward the measurement and use of QIs. Other triggers for the diffusion of QI have been government financial support and an increasingly receptive climate of medical/health care professionals toward QIs. Subsequent steps will have to include the standardisation of measurements, the expansion of the scope and depth of mea-surements, their effective utilisation for improvements, and the improvement of their usability for patients and consumers.

Republic of Korea

Several quality assurance initiatives are underway in Korea, some for many years. The Korean Hospital Association started a *Hospital Standardisation Programme* in 1981, limited initially to teaching hospitals and without public reporting of any findings. Later developments included expansion of the programme to include all hospitals with more than 300 beds and public reporting. More recently, in response to some concerns such as the administrative burden on hospitals and unintended effects including informal hospital ranking by mass media and gaming behaviour, the programme was replaced in 2011 by a voluntary programme run by the Korea Institute for Healthcare Accreditation, a public-private partnership. This new accreditation programme uses novel survey methods such as tracer methodology to follow the patient pathway, and places greater emphasis on patient safety. There has been some concern however that patient reported measures have become less important in the new accreditation framework.

Korea also has a long history of implementing clinical practice guidelines, supported by both governmental and professional initiatives. The Ministry of Health funds various clinical research centres to develop guidelines, co-ordinated by the National Strategic Co-ordinating Center for Clinical Research, which acts as a guideline clearinghouse, identifying and disseminating guidelines of appropriate quality. At the same time, the Korean Academy of Medical Sciences (KAMS), to which most academic medical societies belong, supports methodological research for guideline development. KAMS runs an independent information centre for guidelines, the *Korean Medical Guideline Information Center*. It is recognised that while guideline development activities are increasing, efforts to disseminate, implement, and evaluate guidelines need on-going strengthening.

Korea's *Health Insurance Review and Assessment Service* (HIRA) is a widely known agency which supports health care organisations to assess and improve their quality of care. HIRA's quality assessment programme began in 2001, gradually expanding the number of health care areas it

assesses over time. Now, 18 areas are assessed by HIRA and public reporting has led to a number of demonstrable health care quality improvements, including reduction in antibiotic prescribing for the common cold, reductions in the numbers of injected medications prescribed and in duplicate prescriptions.

Initially HIRA's indicator programme just reported performance of health care organisations. Since 2007, hospital income has been linked to performance figures through the *Value Incentive Programme* (HIRA-VIP). HIRA-VIP started as a demonstration project covering acute myocardial infarction and caesarean sections among tertiary hospitals in 2007 and was associated with improvement in quality of care for both. As a result, HIRA is planning to expand the VIP programme, both in terms of the numbers of organisations participating and topics covered.

Korea also participates in the OECD *Health Care Quality Indicators* (HCQI) project, enabling Korea to see how it is performing compared to other OECD countries in certain internationally validated measures of health care quality. While some areas (*e.g.* cervical and colorectal cancer five-year relative survival rate, in-hospital case-fatality rate within 30 days after admission for stroke) show relatively good performance, other areas (*e.g.* breast cancer five-year relative survival rate, in-hospital case-fatality rate within 30 days after admission for AMI, uncontrolled diabetes hospital admission rate, asthma hospital admission rate) do not. Media reporting of these results has triggered widespread public interest in health care quality issues, and in 2011 the Korean government requested the OECD to undertake a comprehensive review of the quality of care in its health system, the findings of which were published recently (OECD, 2012d).

Malaysia

Malaysia has a long history of working towards quality improvement in health care. In the 1970s and 1980s, many initiatives were undertaken independently in health clinics, hospitals and institutions, including prenatal and maternal mortality reviews, morbidity and mortality reviews, quality control circles, medical audits, nursing audits and investigation of complaints. Registration and licensing of health care professionals were also in place many years ago, as well as self-regulation and publication codes of conduct and ethics by professional societies.

In 1985, a formal *National Quality Assurance Programme* (QAP) was launched by the Ministry of Health (MOH) to coordinate quality initiatives, comprising two main approaches: a *National Indicators Approach* (NIA) and a more local *Hospital/District Approach* (HSA/DSA). As of 2012, the NIA programme monitors a total of 140 national indicators across ten different health service programmes, thus embracing a broad definition of service quality. Complementing this, the HSA/DSA approach allows health care professionals to monitor, identify and address additional quality issues at local level.

A *Strategic Plan for Quality in Health* was implemented in 1997, providing broad direction as well as specifying particular strategies that could embed a quality culture within the health care system. For example, 30 disease registries are now established (jointly supported by MOH, universities and professional organisations); 59 evidence-based *Clinical Practice Guidelines* (supported by MOH and the Academy of Medicine Malaysia) have been disseminated; a voluntary *hospital accreditation programme*, led by the Malaysian Society for Quality in Health, was established in 1997; and a *National Quality Assurance Convention* every other year provides a platform for health care quality teams to share experiences and recognise success. On-going training programmes, at every level of the health care system also support sustenance of the health care quality agenda.

Malaysia also places strong emphasis on patient safety issues. The *Patient Safety Council of Malaysia* was established in January 2003 to develop national patient safety strategy and action plans, including implementation of the WHO-World Alliance for Patient Safety Programme 1st, 2nd and 3rd Global Safety Challenges ("Clean Care Is Safer Care", focussing on hand hygiene; "Safe Surgery Saves Lives Through Better Communication", focussing on communication within surgical teams and with the patient; and "Tackling Antimicrobial Resistance", implementing multiple strategies to combat antimicrobial resistance). *Care Bundles* have been introduced to prevent ventilator associated pneumonia and central venous line blood stream infection among patients in intensive care units.

Recently, an *incident reporting and learning system* was introduced in MOH facilities, requiring hospitals, health and dental clinics to report incidents related to patient safety and to conduct investigations to find the root cause of the problem. Safe and quality use of medicines, through *medication error prevention* and *adverse drug reaction monitoring* are ongoing activities; of note, a *Drug Information Service* and *National Pharmacy Call Centre* have been established for patients.

Patient safety is a national priority area for research. A significant proportion of the research budget is allocated to establish the extent of patient safety issues and to identify effective solutions to areas related to medical safety, medication safety, blood transfusion safety, vaccine safety, laboratory safety, safety culture among health care professionals, communication, dental safety, patient falls and patients unvoiced needs.

Overall, Malaysia is fortunate that efforts to promote and sustain health care quality are a government-wide priority. Reflecting this are an array of national awards which recognise the achievements of players in improving health care quality, such as the Prime Minister Quality Awards, Public Services Awards and the MOH Quality/Innovation Awards.

Further information is available from the following publications and websites: *Quality Manual: National Indicator Approach* (NIA), Ministry of Health, Malaysia, 1999; *The Strategic Plan for Quality in Health*. Ministry of Health, Malaysia, 1998; Patient Safety Council of Malaysia Official Portal; *http://patientsafety.moh.gov.my/*; Malaysian Society for Quality in Health Official Portal; *www.msqh.com.my*; Academy of Medicine of Malaysia Official Portal; *www.acadmed.org.my/*.

The Philippines

To support monitoring performance and conditions of hospitals, PhilHealth, the Government Health Insurance Agency, introduced the *Benchbook* in 2002. Its aim was to provide accreditation to hospitals meeting a set of quality criteria and incentivise quality improvement across the hospital sector. The Benchbook went beyond the typical accreditation procedures looking comprehensively at the following dimensions: 1) Patient rights and organisational ethics; 2) Patient care standards; 3) Leadership and management; 4) Human resource management; 5) Information management; 6) Safe practice and management; and 7) Improving performance.

While both the standards and indicators were developed through a consultative process involving hospitals and professional organisations, a significant proportion of hospitals were initially resistant to the new standards, which they perceived as too stringent and not applicable to the local setting. Furthermore additional costs involved in the preparation for and the actual implementation of the *Benchbook* were often cited by the hospital managers as a hindrance to their compliance. Nevertheless, with time the majority of clinicians and hospital managers came to see the *Benchbook* as an opportunity to assess and document their performance, identify areas in need of improvement and achieve the highest standards of quality. Many champions among individual hospitals, their organisations as well as professional organisations became more vocal on quality issues and the *Benchbook* featured in many clinical and health care management conferences.

The *Benchbook* identifies various accreditation categories, including *Centre of Excellence, Centre of Quality,* and *Centre of Safety*, depending on the survey scores of the hospitals. Hospitals not meeting minimum scores are either given provisional accreditation or have their application denied. Special consideration is given to providers in deprived and hard-to-reach areas to ensure that already limited services provided are not be further disrupted; typically, they are given provisional accreditation for a maximum of one year during which they are required to submit a plan of action to correct their deficiencies.

During the initial accreditation survey in 2010, two-thirds of the 1,609 hospitals that applied for accreditation qualified only for a six-month provisional accreditation while 7% were denied accreditation. Only 19% of the hospitals were given regular accreditation as Centres of Safety (12%), Centres of Quality (5%) and Centres of Excellence (2%). Six months later, by December 2010, the trend between provisionally accredited hospitals and those awarded as Centres of Safety had been reversed, with the latter increasing to 71% and the former dropping to 13%. This improvement in hospital performance was sustained during the second year of implementation in 2011, with regular accreditation awards increasing to 97% from 81% in the previous year. Further information is available from the Philippine Health Insurance Corporation Accreditation Database at *www.philhealth.gov.ph*.

Singapore

As part of Singapore's quality journey, the Ministry of Health (MOH) introduced *National Standards for Healthcare* (NSHC) in 2008 as a guiding framework to embed a culture of continuous quality improvement throughout the health care system. The primary goal of the NSHC is to ensure that patients receive health care that is appropriate to their needs, based on current evidence and clinical knowledge across the continuum of care (*i.e.* from prevention to acute to step down/long-term care). The NHSC also helps facilitate prioritisation of improvement efforts and alignment of planning initiatives.

The standards under the NSHC cover seven domains – accessible care, appropriate care, patient-centred care, safe care, a learning institution, public health and finally, the physical environment and amenities. The NSHC is not meant to be exhaustive but focuses on key areas of concern. There is a robust performance measurement framework to assess how far institutions have measured up against the NHSC. This comprises a national-level *National Health System Scorecard*, which is then cascaded down to setting- and provider/specialty-level scorecards.

The scorecards are closely based on indicators developed under the *OECD Health Care Quality Indicator* (HCQI) project. This allows MOH to benchmark Singapore's performance with OECD countries on a "like-for-like" basis, enabling identification of areas of strong performance, and of areas where improvements are needed to close quality gaps. For example, the OECD HCQI's indicators on hospitalisations for ambulatory care sensitive conditions enabled evaluation of the national *Chronic Disease Management Programme* (covering conditions such as diabetes, hypertension and asthma).

The NSHC was implemented using a two-pronged approach: first, a governance-based approach, with both the NSHC and relevant scorecards incorporated into the governance agreements between MOH and the public sector health care providers. These agreements lay out MOH's expectations of the public health care institution and their operating parameters, and the standards of service and key deliverables required of the institutions. The institutions' scorecards thus provide the basis for an annual discussion between the Ministry and the institutions on the individual institutions' performance. The cross-comparison of performance across the institutions also provides the impetus for continued improvement.

Second, a collaborative approach, with MOH funding setup of *Healthcare Performance Offices* (HPO) in public sector institutions. The HPOs help align and co-ordinate the respective institutions' efforts in meeting NHSC requirements. Each HPO is chaired by a senior clinical leader who reports directly to the institution Chief Executive Officer (CEO)/Chairman Medical Board (CMB).

The NSHC framework complements MOH's existing efforts to encourage *innovation* amongst health care providers and professionals. Various funds are available to facili-

tate testing of novel ideas or programmes that have the potential to significantly improve the quality of care. These include funding from the National Medical Research Council, the Health Services Development Fund, the Health Services Research Fund and the Health Quality Improvement Fund. The MOH also promotes the cross-fertilisation of ideas through seminars and public events and invests in the continuing training and development of health care professionals in the goals and methods of quality improvement.

As a small city state, Singapore has been able to undertake its quality improvement on a national scale. However, the lessons learnt are no less relevant to local health care systems in larger countries, where state, provincial or local responsibility for health care is the norm.

Sri Lanka

The *Continuous Quality Improvement Programme* initiated in 2000 at the Castle Street Hospital for Women (CSHW), is a recent success in Sri Lanka's expanding health care quality agenda. CSHW, a government teaching hospital with 204 beds in Colombo, introduced a system based on *kaizen,* a Japanese model for continuous quality improvement, popularly known as 5S. At CSHW, this took a comprehensive approach to quality, safety and productivity, comprising several elements such as:

- *Total Clean*, which put new emphasis on cleanliness of the clinical environment by using cleaning check lists and schedules;
- introduction of printed forms and charts, including *pre- and post-operative checklists* and *discharge checklists*. As well as standardising care, these forms actually lightened the administrative workload of clinical staff (who earlier had to prepare such forms by hand);
- regular *customer satisfaction surveys,* encouragement of customer suggestions, through suggestions boxes, and questionnaires with self-addressed envelopes sent to randomly selected patients. Findings were regularly fed-back to hospital managers;
- encouragement of *staff work-improvement suggestions*, collected via Work Improvement teams and Kaizen Suggestion Schemes, also fed-back to managers;
- greater emphasis on *information analysis*, including *development and monitoring of performance indicators*. In particular, each ward began maintaining their statistics, such as customer satisfaction and adverse events. These were aggregated to hospital level and some publicly displayed on notice boards.

The hospital notes that implementation of the 5S programme was associated with a reduction in maternal mortality rate, infection rates, neonatal death rate and still birth rate, as well as increases in the patient satisfaction rates. The hospital has won many awards including Taiki Akimotto Award, National Productivity Award and National Quality Award.

The hospital also became recognised as the focal point for National Quality Assurance Programme of the Ministry of Health, whose Quality Secretariat are seeking to expand the programme to other hospitals. To date, diverse hospitals such as the Ampara District General Hospital, Mahiyanganaya Base Hospital (remotely located and serving a predominantly indigenous population), Gampaha District General Hospital, Balapitiya Base Hospital and Kurunegala Teaching Hospital have implemented 5S and won many awards in Productivity and Quality. In particular, the Mahiyangana hospital has received visiting study tours interested in learning from its quality improvement initiatives, including delegations from eight African countries, funded by the Japan International Cooperation Agency (JICA).

Recently, the Ministry of Health has also disseminated 93 *clinical guidelines* to all secondary and tertiary care hospitals with the objective of reducing variation in clinical practice.

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ANNEX A

National data sources

Bangladesh

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ANNEX B

Additional information on demographic and economic contexts

Table B.1. **Total mid-year population, thousands, 1960 to 2010**

	1960	1970	1980	1990	2000	2010
Australia	10 286	12 728	14 710	17 096	19 164	22 268
Bangladesh	50 102	66 881	80 624	105 256	129 592	148 692
Brunei Darussalam	80	125	189	252	327	399
Cambodia	5 433	6 938	6 506	9 532	12 447	14 138
China	658 270	814 623	983 171	1 145 195	1 269 117	1 341 335
Fiji	393	521	635	728	812	861
Hong Kong, China	3 076	3 958	5 054	5 794	6 783	7 053
India	447 844	553 874	700 059	873 785	1 053 898	1 224 614
Indonesia	91 947	118 362	150 820	184 346	213 395	239 871
Japan	92 501	103 710	115 915	122 251	125 720	126 536
Korea, DPR	10 946	14 247	17 239	20 143	22 894	24 346
Korea, Republic	25 074	31 443	37 460	42 980	45 988	48 184
Lao PDR	2 130	2 691	3 235	4 192	5 317	6 201
Macao, China	171	251	246	360	432	544
Malaysia	8 160	10 909	13 833	18 209	23 415	28 401
Mongolia	957	1 282	1 693	2 193	2 411	2 756
Myanmar	20 957	26 164	32 865	39 268	44 958	47 963
Nepal	9 740	11 918	15 045	19 081	24 401	29 959
New Zealand	2 372	2 820	3 147	3 398	3 858	4 368
Pakistan	45 920	59 383	80 493	111 845	144 522	173 593
Papua New Guinea	1 967	2 435	3 215	4 158	5 379	6 858
Philippines	26 010	35 451	47 064	61 629	77 310	93 261
Singapore	1 634	2 074	2 415	3 017	3 919	5 086
Solomon Islands	118	160	229	310	409	538
Sri Lanka	10 020	12 555	15 083	17 337	18 745	20 860
Thailand	27 312	36 915	47 483	57 072	63 155	69 122
Viet Nam	35 173	44 928	54 023	67 102	78 758	87 848
Asia-22	**1 573 459**	**1 958 682**	**2 410 512**	**2 910 839**	**3 367 505**	**3 740 764**
OECD	**790 712**	**892 171**	**983 896**	**1 065 498**	**1 148 897**	**1 233 696**

Source: UNDESA (2011), *World Population Prospects: The 2010 Revision.*

StatLink http://dx.doi.org/10.1787/888932723456

Table B.2. **Share of the population aged 65 and over, 1960 to 2010**

	1960	1970	1980	1990	2000	2010
Australia	8.6	8.3	9.6	11.2	12.5	13.4
Bangladesh	3.3	3.4	3.6	3.7	4.0	4.6
Brunei Darussalam	4.1	3.8	3.0	2.8	2.9	3.6
Cambodia	2.7	2.8	2.9	2.8	3.0	3.8
China	4.0	4.0	5.2	5.9	7.0	8.2
Fiji	2.1	2.2	2.6	2.9	3.4	4.8
Hong Kong, China	2.8	3.9	5.9	8.7	11.0	12.7
India	3.0	3.3	3.6	3.8	4.2	4.9
Indonesia	3.6	3.3	3.6	3.8	4.6	5.6
Japan	5.7	7.0	9.0	11.9	17.2	22.7
Korea, DPR	1.9	1.4	2.5	4.7	6.8	9.5
Korea, Republic	3.7	3.3	3.9	5.0	7.3	11.1
Lao PDR	2.6	3.1	3.5	3.6	3.7	3.9
Macao, China	6.5	6.4	8.6	6.7	7.4	7.0
Malaysia	3.4	3.3	3.6	3.6	3.8	4.8
Mongolia	5.0	5.0	4.7	4.3	3.8	4.1
Myanmar	3.4	3.8	4.0	4.4	4.9	5.1
Nepal	2.7	3.0	3.2	3.3	3.5	4.2
New Zealand	8.6	8.5	9.8	11.1	11.8	13.0
Pakistan	4.3	3.8	3.7	3.8	3.9	4.3
Papua New Guinea	2.4	2.1	2.2	2.3	2.5	2.8
Philippines	3.1	3.0	3.2	3.1	3.2	3.6
Singapore	2.0	3.3	4.7	5.6	7.4	9.0
Solomon Islands	2.7	3.5	3.2	2.9	2.9	3.2
Sri Lanka	4.7	3.7	4.4	5.6	6.4	8.2
Thailand	3.3	3.4	3.6	4.6	6.9	8.9
Viet Nam	4.4	4.8	4.9	5.0	5.6	6.0
Asia-22	**3.6**	**3.8**	**4.3**	**4.9**	**5.8**	**6.9**
OECD	**8.6**	**9.9**	**11.4**	**12.1**	**13.5**	**14.6**

Source: UNDESA (2011), *World Population Prospects: The 2010 Revision.*

StatLink http://dx.doi.org/10.1787/888932723475

Table B.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	14
Bangladesh	47	46	42	33	25	21
Brunei Darussalam	42	37	30	28	22	20
Cambodia	45	40	57	40	25	23
China	36	31	21	19	13	13
Fiji	42	33	33	28	24	22
Hong Kong, China	35	20	15	12	7	8
India	40	37	34	30	25	23
Indonesia	44	38	32	25	21	19
Japan	17	19	13	10	9	9
Korea, DPR	33	30	22	21	16	15
Korea, Republic	40	30	20	16	10	10
Lao PDR	42	43	42	40	28	24
Macao, China	25	10	20	16	8	9
Malaysia	41	31	29	27	23	21
Mongolia	48	43	38	28	19	23
Myanmar	42	39	31	25	19	18
Nepal	44	43	41	38	31	26
New Zealand	26	21	16	17	14	15
Pakistan	43	43	43	38	29	28
Papua New Guinea	42	45	38	35	34	31
Philippines	43	38	36	32	29	26
Singapore	34	22	16	19	10	9
Solomon Islands	41	47	42	39	35	33
Sri Lanka	35	29	26	20	19	19
Thailand	42	35	24	18	14	13
Viet Nam	46	39	34	27	17	17
Asia-22	**39**	**34**	**30**	**26**	**19**	**18**
OECD	**22**	**19**	**16**	**14**	**12**	**12**

Source: UNDESA (2011), *World Population Prospects: The 2010* Revision.

StatLink http://dx.doi.org/10.1787/888932723494

Table B.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	1.9
Bangladesh	6.8	6.9	6.0	4.1	2.9	2.4
Brunei Darussalam	6.6	5.9	3.9	3.3	2.3	2.1
Cambodia	6.3	5.5	7.0	5.4	3.4	2.8
China	5.6	4.8	2.6	2.0	1.7	1.6
Fiji	6.0	4.2	3.8	3.4	3.0	2.8
Hong Kong, China	5.3	3.3	1.7	1.2	0.8	1.0
India	5.8	5.3	4.5	3.7	3.0	2.7
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	2.1	2.1
Korea, Republic	5.6	4.3	2.2	1.7	1.2	1.3
Lao PDR	6.0	6.0	6.4	5.9	3.7	3.0
Macao, China	4.4	1.8	2.0	1.4	0.8	1.0
Malaysia	6.2	4.6	3.7	3.4	3.0	2.7
Mongolia	7.5	7.5	5.8	3.3	2.1	2.5
Myanmar	6.1	5.9	4.3	3.1	2.2	2.1
Nepal	6.1	6.0	5.7	5.0	3.7	2.9
New Zealand	4.0	2.8	2.0	2.1	1.9	2.1
Pakistan	6.6	6.6	6.4	5.7	4.0	3.7
Papua New Guinea	6.3	6.1	5.5	4.7	4.4	4.1
Philippines	7.0	6.0	4.9	4.1	3.7	3.3
Singapore	5.1	2.8	1.6	1.8	1.3	1.3
Solomon Islands	6.4	7.2	6.4	5.5	4.6	4.4
Sri Lanka	5.2	4.0	3.2	2.4	2.3	2.4
Thailand	6.1	5.1	2.9	2.0	1.7	1.6
Viet Nam	7.3	7.1	4.9	3.2	1.9	1.9
Asia-22	**5.8**	**5.0**	**4.0**	**3.2**	**2.3**	**2.2**
OECD	**3.2**	**2.6**	**2.0**	**1.8**	**1.6**	**1.7**

Source: UNDESA (2011), *World Population Prospects: The 2010 Revision.*

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Table B.5. **GDP per capita in 2010 and average annual growth rates, 1980 to 2010**

	GDP per capita in USD at PPPs	Average annual growth rate (in real terms)		
	2010	1980-90	1990-2000	2000-10
Australia	39 090	1.6	2.2	1.5
Bangladesh	1 585	1.2	2.9	4.3
Brunei Darussalam	48 621			–1.1
Cambodia	2 065		2.8	6.2
China	7 550	7.7	9.3	9.9
Fiji	4 459	1.4	1.4	0.5
Hong Kong, China	46 128	5.4	2.3	3.5
India	3 419	3.4	3.5	5.9
Indonesia	4 353	3.4	2.5	3.8
Japan	34 330	4.1	0.9	0.7
Korea, Republic	30 042	8.4	5.6	3.8
Lao PDR	2 449	2.9	3.4	5.3
Malaysia	14 744	3.1	4.4	2.6
Mongolia	4 020		–1.5	5.0
Myanmar	1 255			8.1
Nepal	1 269	2.3	2.5	2.5
New Zealand	26 997	0.9	1.6	1.0
Pakistan	2 721	3.3	2.0	2.5
Papua New Guinea	2 333	–0.9	1.4	1.6
Philippines	3 920	–0.7	0.6	2.7
Singapore	56 708	5.5	4.2	3.3
Solomon Islands	2 927	–2.0	–0.1	1.1
Sri Lanka	5 169	3.1	3.9	4.1
Thailand	9 222	5.8	3.4	4.0
Viet Nam	3 143	3.8	5.8	5.9

Source: International Monetary Fund, World Economic Outlook Database, April 2012.

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The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

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WHO is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.

In the 21st century, health is a shared responsibility, involving equitable access to essential care and collective defence against transnational threats. Good health is essential to sustained economic and social development and poverty reduction.

All WHO's work is underpinned by a focus on equity in health. Access to needed health services is crucial for maintaining and improving health. At the same time, people need to be protected from being pushed into poverty because of the cost of health care. Universal health coverage has therefore become a major goal for health reform in many countries and a priority objective of WHO.

Over the coming decade WHO will work on preventing, controlling and managing communicable diseases; reducing the risk of and treating non-communicable diseases (such as diabetes, cardiovascular disease, cancer, mental health, injuries); promoting and protecting health throughout the life course from newborns to older persons; preparing, monitoring and responding to epidemic and pandemic prone diseases, environmental health threats and humanitarian crises; and strengthening health systems and promoting innovation for health.

WHO has offices in over 150 countries, territories and areas which work closely with governments and partners to improve people's health based on WHO's core values, priorities and expertise. The Organization's work in Asia is coordinated by its regional offices based in New Delhi and Manila.

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Health at a Glance Asia/Pacific 2012

This second edition of *Health at a Glance: Asia/Pacific* presents a set of key indicators of health status, the determinants of health, health care resources and utilisation, health care expenditure and financing, and health care quality in 27 Asia/Pacific countries and economies. Drawing on a wide range of data sources, it gives readers a better understanding of the factors that affect the health of populations and the performance of health systems in these countries and economies. Each of the indicators is presented in a user-friendly format, consisting of charts illustrating variations across countries and over time, a brief descriptive analysis highlighting the major findings conveyed by the data, and a methodological box on the definition of the indicator and any limitations in data comparability.

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Chapter 2. Determinants of health
Chapter 3. Health care resources and utilisation
Chapter 4. Health expenditure and financing
Chapter 5. Health care quality

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