This chapter reviews the situation of priority noncommunicable diseases (NCDs) in the Asia Pacific Region, with subchapters covering the well-known “lifestyle” diseases, tobacco control, injuries and violence, mental and neurological illness and substance abuse, and thalassaemia.

Due to rapid epidemiological and demographic transitions, chronic NCDs have become a leading cause of death, morbidity and disability in the Region. Cardiovascular diseases, cancer, chronic lung diseases and diabetes have emerged as major public health problems, and mental health and associated disorders affect a great number of people, especially in the more industrialized countries. Certain genetic diseases are being increasingly recognized and the incidence of accidents and other injuries are growing.

High levels of major risk factors for NCDs in much of the Region suggest that resulting health problems will continue to rise and affect progressively younger age groups, creating a significant impact on the workforce and on overall development. Families and communities of sufferers are also affected through direct and indirect economic loss. The increasing incidence of NCDs among poor and vulnerable groups is widening health inequities within and between countries.

The causes of NCDs are known and are mostly modifiable. Unhealthy diet, physical inactivity and tobacco consumption are risk factors common to several major NCDs. Although many socioeconomic and behavioural factors lie outside the domain of the health sector, health systems should assume responsibility for prevention, care and treatment of most NCDs and prepare for the additional burden and resource needs this will bring.

Effective collaboration between health and other sectors could prevent up to 80% of all cases of heart disease, stroke and diabetes, and 40% of cancers. Accidents and violence are largely civil and regulatory issues. Mental illness is a direct family and community concern. More intersectoral involvement
down to the community level is needed to manage many of these problems on a large scale. Coordinated international efforts have so far focused on tobacco control and the implementation of the first global public health treaty, the WHO Framework Convention on Tobacco Control.

8.1 Lifestyle diseases

Cardiovascular diseases

Cardiovascular disease (CVD) is a range of conditions dominated by coronary heart disease, also referred to as ischaemic heart disease. In a process known as atherosclerosis, a slow accumulation of fatty plaques eventually narrow and block the heart’s coronary arteries. This starves the heart muscle of blood and causes crippling chest pain or a heart attack. By blocking critical blood vessels of the brain, atherosclerosis is also responsible for the majority of strokes (cerebrovascular disease). The global upsurge in CVD is due to changing lifestyles that accelerate the risk of atherosclerosis, such as the growing prevalence of obesity, smoking and high blood pressure, as well as dietary changes and diminished physical activity, all discussed later in this chapter. Rheumatic heart disease falls under CVD but is caused by infection and is, therefore, discussed separately on page 293.

Projected to be the leading killer in all countries by 2020, CVD is responsible for nearly 17 million deaths a year, a staggering one third of global mortality and over 10% of the entire global burden of disease. By comparison, HIV/AIDS claims 3 million lives annually. Often incorrectly seen as a disease of wealthy nations, most deaths from CVD occur in developing countries. As a rising wave of CVD engulfs the Asia Pacific Region, throwing enormous strain on health systems and felling ever growing numbers of people in their most productive years, it poses a grave threat to economic development. By adding to the burden of poor families, who lack the resources to cope when a heart attack or stroke strikes a family member, CVD also creates health inequity.

There were over six million deaths due to CVD in the Region in 2002, with mortality equally divided between ischaemic heart disease and stroke. The absolute burden is similar for males and females. Overall death rates for ischaemic heart disease are higher among men than women, but these differences are not so pronounced for stroke. In some Pacific island countries, Mongolia and Thailand, death rates from stroke are higher among women. Bhutan and India have one of the highest age-standardized rates for ischaemic heart disease for both males and females, while Fiji has the highest rate for males at 304/100 000, and the Maldives the highest rate for females at 218/100 000. Sri Lanka has the highest rate for stroke for males (256/100 000) followed by Vanuatu, Australia and Brunei Darussalam. Mongolia has the highest rate of stroke for females (189/100 000) followed by Tuvalu, Nauru and the Marshall Islands.

Figures 8.1 and 8.2 show mortality estimates for the Asia Pacific Region for females and males for ischaemic heart disease, and Figures 8.3 and 8.4 show mortality estimates for females and males for stroke.

Derived from the WHO Global InfoBase, Table 8.1 shows the burden of CVD for the Asia Pacific Region in terms of disability-adjusted life years (DALYs) lost. It can be seen that the Region contributed to over half the world burden attributable to CVD in 2005, with just over 78 million DALYs lost. Ischaemic heart disease and cerebrovascular disease contribute the major burden of DALYs lost both globally and in the Region.
Fig. 8.1  Age-standardized death rates (per 100 000 population) for ischaemic heart disease among females in selected countries and areas in the Asia Pacific Region, 2005

Fig. 8.2 Age-standardized death rate (per 100 000 population) for ischaemic heart disease among males in selected countries and areas in the Asia Pacific Region, 2005

Fig. 8.3 Age-standardized death rates (per 100 000 population) for stroke among females in selected countries and areas in the Asia Pacific Region, 2005

### Fig. 8.4 Age-standardized death rates (per 100,000 population) for stroke among males in selected countries and areas in the Asia Pacific Region, 2005

<table>
<thead>
<tr>
<th>Country</th>
<th>Age-standardized death rate per 100,000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sri Lanka</td>
<td>256</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>201</td>
</tr>
<tr>
<td>Australia</td>
<td>178</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>176</td>
</tr>
<tr>
<td>Malaysia</td>
<td>175</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>166</td>
</tr>
<tr>
<td>Palau</td>
<td>159</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>140</td>
</tr>
<tr>
<td>Mongolia</td>
<td>137</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>136</td>
</tr>
<tr>
<td>Japan</td>
<td>136</td>
</tr>
<tr>
<td>Singapore</td>
<td>135</td>
</tr>
<tr>
<td>China</td>
<td>134</td>
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<tr>
<td>Bhutan</td>
<td>131</td>
</tr>
<tr>
<td>Samoa</td>
<td>127</td>
</tr>
<tr>
<td>India</td>
<td>126</td>
</tr>
<tr>
<td>Myanmar</td>
<td>126</td>
</tr>
<tr>
<td>Niue</td>
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<td>Timor-Leste</td>
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<tr>
<td>Bangladesh</td>
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<tr>
<td>Marshall Islands</td>
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<tr>
<td>Tonga</td>
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<tr>
<td>Maldives</td>
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<td>Tuvalu</td>
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<td>Indonesia</td>
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<tr>
<td>DPR Korea</td>
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<td>Nauru</td>
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<td>Cook Islands</td>
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<td>Micronesia</td>
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<tr>
<td>Cambodia</td>
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<tr>
<td>Kiribati</td>
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</tr>
<tr>
<td>Thailand</td>
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</tr>
<tr>
<td>Philippines</td>
<td>27</td>
</tr>
<tr>
<td>New Zealand</td>
<td>44</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>34</td>
</tr>
</tbody>
</table>

Rheumatic fever and rheumatic heart disease remain a significant public health problem in developing countries and in socioeconomically disadvantaged groups in developed countries, especially among children. In 1994 it was estimated that 12 million people worldwide suffered from rheumatic fever and rheumatic heart disease, and at least 3 million people had congestive heart failure due to rheumatic heart disease that required repeated hospitalization.7,8

Both rheumatic fever and rheumatic heart disease are complications of Group A streptococcal pharyngitis. The most common infections caused by Group A streptococci are streptococcus pharyngitis and skin impetigo, with a peak in children aged 5–15.9

Reliable data are scarce on the incidence of rheumatic fever and rheumatic heart disease and in many developing countries hospital morbidity data is all that is available. Based on this data, rheumatic heart disease accounts for 12–65% of hospital admissions related to cardiovascular disease.10

The prevalence of rheumatic heart disease in the Asia Pacific Region has been estimated in surveys of schoolchildren (Table 8.2). Although the data are old, they show that there is a wide variation between and within countries, especially among ethnic groups.

It is generally accepted that socioeconomic and environmental factors greatly influence the incidence and prevalence of rheumatic fever and rheumatic heart disease. Shortages of health-care provision and expertise and low levels of awareness have major impacts on rheumatic heart disease, with crowding exacerbating incidence. Conversely, prevention and early treatment of pharyngitis prevents rheumatic fever and subsequent rheumatic heart disease from developing. For secondary prevention of rheumatic heart disease, prophylactic use of long-acting penicillin is recommended.

### Table 8.1 Total DALYs lost due to cardiovascular disease in the Asia Pacific Region, 2005

<table>
<thead>
<tr>
<th>Condition</th>
<th>Females World</th>
<th>Females Asia Pacific</th>
<th>Males World</th>
<th>Males Asia Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischaemic heart disease</td>
<td>25 328</td>
<td>12 814</td>
<td>36 144</td>
<td>16 905</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>24 374</td>
<td>12 982</td>
<td>26 411</td>
<td>15 703</td>
</tr>
<tr>
<td>Hypertensive heart disease1</td>
<td>3 840</td>
<td>1 839</td>
<td>4 023</td>
<td>2 167</td>
</tr>
<tr>
<td>Inflammatory heart disease2</td>
<td>2 416</td>
<td>1 041</td>
<td>3 449</td>
<td>1 235</td>
</tr>
<tr>
<td>Rheumatic heart disease</td>
<td>3 193</td>
<td>2 259</td>
<td>2 566</td>
<td>1 866</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>70 016</td>
<td>35 698</td>
<td>82 994</td>
<td>42 323</td>
</tr>
</tbody>
</table>

1 hypertensive heart disease is a late complication of hypertension in which the heart is affected  
2 inflammatory heart disease is inflammation of the heart muscle and/or the tissue surrounding it.

Note: conditions are listed in descending order of total world burden.

Risk factors for cardiovascular disease

Elevated blood pressure

Hypertension, commonly known as high blood pressure, is a leading risk factor for CVD. Table 8.3 shows estimates of the mean systolic blood pressure (SBP) for people aged 30–44 in the Asia Pacific Region in 2005. For SBP alone, the normal adult range is <120 mmHg and high-normal (pre-hypertensive) 120–139 mmHg. Hypertension is generally considered to begin at or above 140 mmHg. 

As with ischaemic heart disease and stroke, the general trend is for females to have lower mean SBP values than males. The two exceptions are the Maldives and Papua New Guinea, with mean SBP for females of 133.5 mmHg and 120.3 mmHg respectively. The mean SBP for Maldivian females is the highest of all countries in the Region, for both males and females, and falls into the pre-hypertensive range. The mean SBP for males of the Maldives, New Zealand, Tonga and Vanuatu also fall into the pre-hypertensive range (Table 8.3).

Biological and behavioural risk factors

Heart disease and stroke share a group of common risk factors arising out of genetic factors, personal behaviour and socioeconomic environments. These include:

- Raised blood lipids, raised blood pressure, impaired metabolism of glucose, and overweight and obesity (especially central, or abdominal obesity) are a set of physiological risk factors that lead to CVD and are frequently seen in clusters, with more than one present in the same individuals at the same time.
- Tobacco use, physical inactivity, unhealthy diets and excessive alcohol consumption form an antecedent cluster of behavioural risk factors, i.e. aspects of personal behaviour that are associated with an increased risk of noncommunicable disease.
- The operation of these risk factors on individuals and populations is affected by certain non-modifiable risk factors. Sex, ethnic group and age affect the severity of risk exposure and vulnerability to CVD. For instance, increasing age brings a higher incidence of heart disease and stroke and accounts for part of the rise in CVD in ageing populations.
<table>
<thead>
<tr>
<th>Country</th>
<th>Systolic blood pressure (mmHg)</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>SD</td>
<td>mean</td>
</tr>
<tr>
<td>Australia</td>
<td>114.1</td>
<td>11.7</td>
<td>122.6</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>116.6</td>
<td>11.5</td>
<td>115.5</td>
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<tr>
<td>Bhutan</td>
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<td>118.2</td>
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<td>Brunei Darussalam</td>
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<td>14.8</td>
<td>115.3</td>
</tr>
<tr>
<td>Cambodia</td>
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<td>15.0</td>
<td>109.5</td>
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<tr>
<td>China</td>
<td>118.0</td>
<td>15.0</td>
<td>114.5</td>
</tr>
<tr>
<td>Cook Islands</td>
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<td>124.2</td>
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<tr>
<td>Democratic People’s Republic of Korea</td>
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<td>Indonesia</td>
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<tr>
<td>Kiribati</td>
<td>126.0</td>
<td>15.0</td>
<td>115.7</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>118.2</td>
<td>15.0</td>
<td>109.5</td>
</tr>
<tr>
<td>Malaysia</td>
<td>118.8</td>
<td>14.9</td>
<td>111.7</td>
</tr>
<tr>
<td>Maldives</td>
<td>130.1</td>
<td>14.4</td>
<td>133.5</td>
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<tr>
<td>Marshall Islands</td>
<td>122.4</td>
<td>14.2</td>
<td>116.8</td>
</tr>
<tr>
<td>Micronesia, Federated States of</td>
<td>123.3</td>
<td>14.4</td>
<td>116.0</td>
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<td>123.3</td>
<td>16.2</td>
<td>118.8</td>
</tr>
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<td>Myanmar</td>
<td>119.0</td>
<td>15.2</td>
<td>113.0</td>
</tr>
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<td>Nauru</td>
<td>127.9</td>
<td>15.5</td>
<td>117.7</td>
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<tr>
<td>Nepal</td>
<td>122.3</td>
<td>12.7</td>
<td>118.2</td>
</tr>
<tr>
<td>New Zealand</td>
<td>130.9</td>
<td>15.4</td>
<td>117.7</td>
</tr>
<tr>
<td>Niue</td>
<td>124.1</td>
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<td>119.7</td>
</tr>
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<td>Palau</td>
<td>128.9</td>
<td>15.7</td>
<td>121.9</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>117.1</td>
<td>13.1</td>
<td>120.3</td>
</tr>
<tr>
<td>Philippines</td>
<td>121.6</td>
<td>15.5</td>
<td>115.2</td>
</tr>
<tr>
<td>Republic of Korea</td>
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<td>16.5</td>
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<td>Samoa</td>
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</tr>
<tr>
<td>Singapore</td>
<td>119.8</td>
<td>15.1</td>
<td>111.9</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>114.7</td>
<td>12.5</td>
<td>110.6</td>
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<td>Sri Lanka</td>
<td>122.0</td>
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<td>Thailand</td>
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<td>112.4</td>
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<tr>
<td>Tonga</td>
<td>132.2</td>
<td>16.4</td>
<td>124.1</td>
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<td>Tuvalu</td>
<td>122.4</td>
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<td>116.8</td>
</tr>
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<td>130.1</td>
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<td>122.9</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>117.8</td>
<td>14.9</td>
<td>114.0</td>
</tr>
</tbody>
</table>

Environmental risk

Personal risk factors are only a part of the CVD picture. As more people move to cities and economies grow, a number of social changes occur which directly increase CVD risk.

- **Transport and work:** The once ubiquitous bicycle is disappearing throughout Asia. Cityscapes once dominated by this active, non-polluting form of transport have been overtaken by successive waves of motorcycles and then cars, bringing noise, injuries and inactivity in the rush for convenience and speed. In developing countries, most physical activity takes place in transport and work domains, unlike developed countries where leisure-time physical activity is much more important. The loss of cycling is not being replaced by other forms of activity in the Region. With the move to cities, occupational patterns are changing too. Rural, active occupations are replaced by more sedentary, urban jobs.

- **Prices:** The price of tobacco, alcohol, processed and fast food is often well within the means of the growing income of the Region’s populations. A poor person in the Philippines is able to purchase loose cigarettes, a beer, a mini-sized bottle of sugared soft drink and a fast food combination meal for a total of not much more than US$ 1. While conventional wisdom suggests that these commodities are for the rich who can afford to buy them, the marketing strategy of companies concerned will ensure availability for all but those living in absolute poverty.

- **Social norms:** Norms are not changing as fast as economies develop. As many of the Region’s countries emerge from times of major food insecurity, parents still consider an overweight child healthy and slim one sickly. This compounds the problem of consumption of unhealthy processed and convenience foods high in calories, fats and salt; and plays into the hands of advertising aimed at children, which reinforces their changing dietary preferences.

- **Policy myths:** Despite overwhelming evidence to the contrary, national and international policy-makers continue to cling to the belief that CVD is limited to the rich and that it is possible to first deal with infectious diseases before solving problems of noncommunicable diseases (NCD), or that the risk of CVD is determined by personal responsibility and not the need for government intervention. There are many examples of what one might term “myth-informed” policy-making.

These environmental factors, together with increasing longevity, are the main reason for the current epidemics of NCD in general and CVD in particular. They must become the main points of intervention if there is to be effective prevention. Campaigns that limit themselves to raising awareness and providing information are doomed to fail and may simply be “blaming the victim” when the main attention should focus on the causes and the social and environmental determinants of risk.

Health services as a determinant of cardiovascular diseases

A key environmental determinant of CVD morbidity and mortality is the health service itself. Apart from the personal and environmental risks outlined above, the risk of developing a stroke, for example, is strongly related to the control of blood pressure. Thus the management of raised blood pressure is an intervention of major importance for the prevention of strokes and their recurrence.

Yet access to control of raised blood pressure is not given due priority in many developing countries of the Asia Pacific Region, where most often there is no access to socialized medicine and private medical services provide care for chronic diseases. Social health insurance schemes exist in some countries (e.g. the Philippines, Sri Lanka, Thailand and Viet Nam), yet often there is no coverage for
regular drug treatment of raised blood pressure. Countries such as India are now beginning to put in place risk factor surveillance as the first step towards a comprehensive NCD control programme integrated with the public sector health delivery system.

**Lowering cardiovascular risk in high-risk individuals**

Several forms of therapy, including the lowering of blood lipids, blood pressure and blood sugar can prevent CVD by decreasing the risk of coronary heart disease and stroke. There is a close association between cardiovascular risk and levels of blood lipids, blood pressure and blood sugar. Therefore, defining cut-off points for treatment based on single risk factor levels is arbitrary and can no longer be justified. Treatment decisions need to be based on total cardiovascular risk.

Decisions about whether to initiate specific preventive action, and with what degree of intensity, should be guided by estimation of the risk of vascular events. The recently released WHO/International Society of Hypertension cardiovascular risk prediction charts for all WHO regions, allow treatment to be targeted according to predictions of total cardiovascular risk. People with established coronary heart disease or cerebrovascular disease are at very high risk of recurrent heart attacks and strokes and need intensive interventions. For example, the effectiveness of statin drugs for lowering lipids in those at high risk is well established. With regard to lowering lipids for primary prevention of CVD, many studies confirm that the benefits depend on the level of cardiovascular risk: the higher the total cardiovascular risk the greater the benefit. Overall, primary prevention trials have provided evidence that lowering lipids with a statin is justifiable on risk-benefit grounds, and is cost-effective in subjects who are at high risk of developing CVD, realizing a reduction in risk of over 20% over a period of 10 years. The CVD risk threshold for lowering lipids with statins should be decided at a national level, because whether a risk threshold is cost-effective will, to a large extent, depend on the financial resources available and the cost of statin drugs.

For those receiving treatment, ample anecdotal evidence shows that in developing countries of the Region there is no easy access to effective counselling, and control of blood pressure is of poor quality.

**The potential for prevention**

There are numerous examples of a successful reduction of CVD burden or risk in countries such as Finland, Mauritius and Poland. This section will consider a remarkable success in the Asia Pacific Region—the fight against stroke in Japan. The overall change is seen in Figure 8.5.

From the year after the Tokyo Olympics (1964), an immediate and dramatic drop is seen for both men and women in the age-adjusted mortality from stroke. This was a prominent feature of the health transition in Japan over the last half century and contributed greatly to the increase in life expectancy. One recent review estimated that the decline for all types of stroke averaged around 5% annually for both men and women from 1965 to 1974, accelerated to a decline of around 8% annually from 1975 to 1989, and then slowed to an average 1% (men) and 3% (women) annual decline from 1990 to 1997.

The dramatic fall in stroke mortality in Japan over the last decades has been correlated with a reduction in tobacco smoking and the control of blood pressure. The same study suggests that annual declines in smoking and blood pressure in middle-aged and elderly men and women correlate with declines in mortality. Such findings favour a combined primary, population approach (tobacco control, salt reduction, alcohol control, physical activity and healthy diet) and secondary prevention (lowering of cardiovascular risk by lowering blood pressure, blood lipids and blood sugar) as essential and complementary techniques for preventing CVD.
Even though concerns have been expressed on the recent slowing of the decline of stroke mortality in Japan, the rapidity and steepness of the fall lend great support to arguments that a rapid reversal of the epidemic is possible and that the means to do so are within the resource constraints of developing countries in the Region. The technology that brought about this decline in Japan is based on population prevention and systematic primary care.

**Reducing risk**

The world health report 2002 – reducing risks, promoting healthy life\(^2\) estimated the burden of disease by major risk factors for all regions of the world. It also estimated the cost-effectiveness of population and high-risk interventions to prevent and control CVD. The report considered various scenarios for CVD prevention and control that included population approaches (promoting small reductions in risk across the whole population) and individual approaches (achieving major risk reduction in people at high risk).

Examples of interventions deemed cost-effective (depending on the burden and specific country situation) include:

- Tobacco control is the most cost-effective of interventions considered in this report, and ranks high in the top five interventions for risk reduction worldwide. Taxation is the most cost-effective of the tobacco control interventions, and from a pure NCD prevention standpoint, the higher the rate of tax, the greater the effect. Advertising bans, control of smoking in public places, and health education for tobacco control add to the range of cost-effective interventions. Nicotine replacement therapy would be effective but adds considerably to costs.

- Population-wide salt reductions, based on either voluntary agreements with industry to reduce salt in processed food or on legislated changes with quality control and enforcement.

- Individual-based hypertension treatment and health education is cost-effective, especially if it targets people with higher levels of blood pressure (systolic blood pressure above...

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**Fig. 8.5 Age-adjusted mortality rates by sex for stroke and selected cardiovascular diseases in Japan, 1950–2003**

160 mmHg. However, as there is a continuous relationship between cardiovascular risk and blood pressure, blood lipids and blood sugar, the report does not recommend an approach based on individual treatment of high blood pressure alone (single risk factor approach), but that a comprehensive risk approach should be taken. In 2002, WHO produced a comprehensive CVD-risk management package for low- and medium-resource settings. More recently, WHO released CVD prevention guidelines enabling a total risk approach, which is feasible and cost-effective, even in low-resource settings.

- Strategies to reduce cholesterol levels, whether through population-wide health education or through individual approaches that provide statins to people with cholesterol above 6.2 mmol/l, were deemed very cost-effective in all regions.

- Measures focused on the early detection and management of diabetes.

**The WHO STEPwise approach to Chronic Disease Risk Factor Surveillance**

Cardiovascular disease prevention programmes can be integrated with others that share common risk factors, such as diabetes, cancer and chronic respiratory disease. This can be organized in a WHO STEPwise approach to Chronic Disease Risk Factor Surveillance (STEPS) fashion, which implies that programmes would be evidence-based and devised in a manner that is responsive to resources and other constraints in the country.

Using STEPS for intervention was first explored in the Pacific countries and areas; and the following table from *The world health report 2003 – shaping the future* illustrates an example of such a comprehensive, population-based, integrated STEPS package.

Table 8.4 was adapted from the proceedings of the Meeting of Ministers of Health for the Pacific Island Countries in Nukualofa, Tonga, between 9 and 13 March 2003. As WHO moves to develop a core package of interventions on NCD for publication in the near future, this table is reproduced for historical purposes and to illustrate the contribution made by countries in the Asia Pacific Region to global approaches in CVD and NCD control.

**Planning, policies and programmes**

Planning for CVD has been integrated with other aspects of NCD prevention and control covered in this publication (tobacco page 313, diabetes page 302, rheumatic heart disease page 293 and nutrition page 363). This section focuses on how to better understand the overall approach to the epidemic, with selected examples of work being done.

As a result of country requests, high-level resolutions were adopted by WHO regional committees for the development of global and regional frameworks for prevention and control of NCDs. Many countries in the Region now have national NCD plans. Additionally, training in capacity building for policy-makers and programme managers from health and other sectors has been undertaken, facilitated by WHO.

The Tonga National NCD Plan 2003–2004 was the first STEPS plan developed, with the collaboration of the Australian Agency for International Development and the Secretariat of the Pacific Community. Viet Nam’s national NCD plan was the first of the Region’s developing countries to receive endorsement at the highest level of government. Indonesia and Thailand have framed national integrated NCD policies and strategies, and India launched the National Programme for Prevention and Control of Diabetes, Cardiovascular Diseases and Stroke in late 2006.
Table 8.4 STEPS approaches for the prevention and control of noncommunicable diseases

<table>
<thead>
<tr>
<th>Resource Level</th>
<th>Population approaches</th>
<th>Individual high-risk approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Core</strong></td>
<td>National level</td>
<td>Community level</td>
</tr>
<tr>
<td>WHO Framework Convention on Tobacco Control (FCTC) is ratified in the country.</td>
<td>Local infrastructure plans include the provision and maintenance of accessible and safe sites for physical activity (such as parks and pedestrian-only areas).</td>
<td>A sustainable, accessible and affordable supply of appropriate medication is assured for priority noncommunicable diseases.</td>
</tr>
<tr>
<td>Tobacco control legislation consistent with the elements of the FCTC is enacted and enforced.</td>
<td>Health-promoting community projects include participatory actions to cope with the environmental factors that predispose to risk of noncommunicable diseases, such as inactivity, unhealthy diet, tobacco and alcohol use.</td>
<td>A system exists for the consistent, high-quality application of clinical guidelines and for the clinical audit of services offered.</td>
</tr>
<tr>
<td>A national nutrition and physical activity policy consistent with the Global Strategy is developed and endorsed at cabinet level; sustained multisectoral action is evident to reduce fat intake, reduce salt (with attention to iodized salt where appropriate); and promote fruit and vegetable consumption.</td>
<td>Active health promotion programmes focusing on noncommunicable diseases are implemented in settings such as villages, schools and workplaces.</td>
<td>A system for recall of patients with diabetes and hypertension is in operation.</td>
</tr>
<tr>
<td>Health impact assessment of public policy is carried out (i.e. transport, urban planning, taxation, and pollution).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2: Expanded</strong></td>
<td>Tobacco legislation provides for incremental increases of tax on tobacco, and a proportion of the revenue is earmarked for health promotion.</td>
<td>Sustained, well-designed programmes are in place to promote:</td>
</tr>
<tr>
<td></td>
<td>Food standards legislation is enacted and enforced, and includes nutrition labelling.</td>
<td>• Tobacco-free lifestyles, e.g. smoke-free public places and smoke-free sports;</td>
</tr>
<tr>
<td></td>
<td>Sustained, well-designed national programmes (counter-advertising) are in place to promote non-smoking lifestyles.</td>
<td>• Healthy diets, e.g. low-cost, low-fat goods, fresh fruit and vegetables;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Physical activity, e.g. &quot;movement&quot; in different domains (occupational and leisure).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Systems are in place for selective and targeted prevention aimed at high-risk populations, based on absolute levels of risk.</td>
</tr>
<tr>
<td><strong>Step 3: Optimal</strong></td>
<td>Country standards are established that regulate marketing of unhealthy food to children.</td>
<td>Recreational and fitness centres are available for community use.</td>
</tr>
<tr>
<td></td>
<td>Capacity for health research is built within countries by encouraging studies on noncommunicable diseases.</td>
<td>Support groups are fostered for tobacco cessation and overweight reduction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Appropriate diagnostic and therapeutic interventions are implemented.</td>
</tr>
</tbody>
</table>

**Monitoring and surveillance**

The STEPS approach covers the essential risk factors for CVD, and has been adopted as the standard across the Asia Pacific Region. The last five years have seen STEPS surveys in 15 Pacific island countries and/or STEPS-compatible surveys in China, Bangladesh, the Democratic People’s Republic of Korea, India, Indonesia, Malaysia, Maldives, Mongolia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand and Viet Nam.

This has created an invaluable and unique resource of comparable data sets on CVD and NCD risk factors. They are currently in use in their countries of origin but efforts are being made to develop policy mechanisms to permit a wider sharing of data. In South-East Asia, WHO has made progress with the creation of an InfoBase consisting of data from STEPS and other surveys, becoming a unified resource for researchers and policy-makers interested in comparable data on NCD.

**Community-based initiatives for health promotion**

In the Asia Pacific Region there has been an effort to foster community demonstration projects, with most countries now able to report some action at the community level. These projects have had a number of notable successes:

- In Cambodia, Mongolia and Viet Nam, NCD projects have attracted substantial external funding and diabetes initiatives are spreading as a result.
- In the Philippines, projects among the Pateros and Guimaras communities were used as the testing ground for a range of initiatives, which included the development of training materials for primary care workers across the country, and contributed to the development of national standards for primary care centres of wellness.
- Community-based interventions for prevention of NCD were implemented with WHO support in Bangladesh, India, Indonesia and Sri Lanka. These projects furnished evidence on the feasibility and appropriateness of applying community-based approaches for integrated prevention and control of NCD in developing countries. A project in Depok, near Jakarta, Indonesia, has gained considerable recognition and paved the way to initiate further subnational interventions in Indonesia.

**Clinical prevention guidelines**

Through the work of ministries of health in many countries of the Region, and extensive technical support from WHO, there are now evidence-based guidelines (usually in national languages) for the control of elevated blood pressure and diabetes. This is only a first step. For both elevated blood pressure and diabetes, there is a need to achieve good, lifelong control in order to reduce CVD complications. Where evidence exists, for example in Cook Islands, India, Mongolia, Nepal and Viet Nam, the level of clinical control of these conditions in primary care is poor. This is likely to be the general case in developing countries of the Region and experiences point to a number of urgent health systems developments that are still needed:

- **Guidelines are only documents.** Guidelines need intensive support for implementation, including their incorporation into undergraduate and in-service training, and in quality assurance and incentive mechanisms. These are still rare in the Region.
- **Health systems are generally private.** Insurance schemes, where present, only sporadically cover CVD and NCD, and the burden usually falls on patients to buy lifelong treatment.
• **There is insufficient investment in patient education and information.** Chronic diseases are best managed in a self-care setting and health-illiterate patients are less effective in self-care.

• **Chronic diseases are handled in separate vertical programmes.** While this is logical for all chronic diseases, for instance HIV/AIDS, tuberculosis, cancer and CVD, in reality decisions are made based on the availability of funds and the priorities of donors rather than the burden of disease or community needs. Thus, individual vertical projects have evolved that have resulted in fragmented care, rather than a wider, integrated health systems approach.

**Network development**

Networks are needed in the area of NCD prevention and control in order to foster communities of practice among policy-makers with a responsibility for these diseases. The Region has developed networks of managers involved in the area of NCD prevention and control.

The South-East Asia Network for NCD Prevention and Control (SEANET-NCD) has developed its charter and plan of action at its regional meeting hosted by the Ministry of Health, Maldives, in November 2005. The network plays an important role as a forum for promoting intercountry collaboration in adopting an integrated approach to NCD control. It contributes to dissemination of information and the exchange of expertise, and facilitates multisectoral, multidisciplinary and multilevel collaboration.

In the Western Pacific, a network has been operating since 2000 under the Western Pacific Declaration on Diabetes (WPDD). Diabetes is a disease in its own right, but it is also a major risk factor for CVD, and the work of WPDD is a direct contribution to CVD prevention and control. The work of WPDD is further described on page 307. An informal network based on an electronic mailing list under the name of Mobilization Of Allies in NCD Action (MOANA) has been operating since April 2006 and serves as a source of news and updates for members.

Apart from the regional networks, similar networks are encouraged at the national level as a vehicle for information dissemination and for joint advocacy. An example of excellence exists in the Philippines, where a coalition of more than 40 governmental and nongovernmental agencies have come together and, at the time of writing, are nearing the end of their third year of active collaboration.

**Diabetes mellitus**

Diabetes is a group of heterogeneous disorders characterized by hyperglycemia (high blood sugar level) due to insulin deficiency, impaired effectiveness of insulin action, or both. Diabetes can lead to serious complications, such as cardiovascular disease, stroke, blindness, renal failure, foot ulceration and sensory neuropathy. Women with gestational diabetes (GDM) and children of GDM pregnancies are at increased risk of developing diabetes and heart disease later in life.

Type 1 diabetes, Type 2 diabetes and GDM are of major public health importance. Type 1 diabetes is most frequently first diagnosed in children and young adults and often has an autoimmune basis. In most countries of the Asia Pacific Region, Type 1 diabetes accounts for less than 5% of diabetes cases, except in Australia and New Zealand, where the figure is 10%–15%. Type 2 diabetes typically occurs in adults, but is increasingly affecting all ages, including children. Type 2 diabetes accounts for approximately 85%–95% of all diabetes cases in the Region. The highest prevalence is noted in Pacific island countries and areas. This is due to rapid changes from traditional to more affluent lifestyles. Gestational diabetes refers to glucose intolerance diagnosed for the first time during pregnancy.
There is currently little information available about modifiable risk factors for the development of Type 1 diabetes. Type 2 diabetes is strongly associated with modifiable behavioural risk factors such as overweight and obesity, abdominal obesity, physical inactivity, maternal diabetes, total fat intake, some saturated and trans fats intakes, and intrauterine growth retardation. Obesity doubles the risk of Type 2 diabetes.

**Prevalence and mortality**

In 2007 it was estimated that nearly 113 million people in the Region, or about 5.1% of the adult population, have diabetes, and an additional 157 million adults (7.0%) have impaired glucose tolerance (IGT). Figure 8.6 shows the 2007 prevalence estimates of diabetes and IGT by country. Estimates in 2000 showed that there were 2.9 million deaths worldwide directly due to diabetes, of which 51%, or 1.5 million deaths, were in the Asia Pacific Region. Worldwide, there were an additional 4.6 million people with diabetes who died from other causes such as CVD. Therefore, annual mortality attributable to diabetes in the Region could be over of two million. The prevalence figures shown are a substantial increase on previous years; and although detection, diagnostic and surveillance techniques have improved, the incidence of diabetes in almost all countries is increasing, following a general trend worldwide. Of the 44 countries listed, 30 have a significant diabetes prevalence of 5% and higher. As could be expected, the general trend in IGT prevalence is much higher than that of diabetes. Only seven countries have an IGT prevalence of less that 5%. If left unmanaged, there is a strong possibility that IGT will develop into diabetes.

The control of underlying and intermediate risk factors will reduce the incidence of chronic diseases. Therefore, comprehensive NCD programmes that include action on diabetes have been developed with WHO support in many countries of the Region. This response to the NCD epidemic is outlined in a framework based on four action areas: national planning, surveillance, healthy lifestyles and environments, and clinical preventive services.

**National planning**

High-level policy interventions are needed to promote intersectoral collaborations to create an environment that is conducive to the development of healthy lifestyles through informed choices. WHO supports and encourages all countries in the Region in making comprehensive national NCD policies and plans. As a result, integrated NCD policies and plans have been developed in most countries, together with specific policies on tobacco, nutrition, physical activity, alcohol, hypertension, diabetes and cancer.
Fig. 8.6 Prevalence estimates of diabetes and impaired glucose tolerance in the Asia Pacific Region, 2007

The creation of health promotion foundations for funding NCD prevention and control activities is well underway. Several countries including Australia, Fiji, India, Malaysia, New Zealand, Thailand and Tonga have passed legislation to enable the establishment of health promotion foundations. Elsewhere in the world, health promotion foundations are involved in a wide range of activities funded from the taxes imposed on items such as alcohol and tobacco. They also use strategies such as social marketing, provision of health information and education, and the creation of environments and settings that are supportive of health.

**Surveillance**

The WHO Stepwise approach to Risk Factor Surveillance (STEPS) framework for NCD intervention has been accepted as the regional standard, and STEPS surveys have been undertaken, or are being undertaken, in 30 countries in the Region. American Samoa, China, Cook Islands, Fiji, India, Indonesia, Malaysia, the Marshall Islands, Mongolia, Nauru, Nepal, the Philippines, Samoa, Sri Lanka, Thailand, Tokelau, Vanuatu and Viet Nam have undertaken STEPS surveys and have published reports. STEPS surveillance technical meetings have been conducted in most of these countries to support them in analysing the results of STEPS survey information.

The results have provided baselines on NCD and risk factor prevalence and identified priorities for intervention programmes. In most of these countries, STEPS has been incorporated into the routine health information system and will provide future data on trends and programme effectiveness.

**Healthy lifestyles and environments**

Many countries in the Region have developed demonstration activities in community-based prevention. These include:
• Integrated community-based NCD prevention projects in Bangladesh, India and Indonesia.
• Childhood obesity reduction through health-promoting schools in China.
• Diabetes control in Cook Islands.
• Development of a physical activity campaign in Mongolia.
• Diabetes prevention in two provinces in Viet Nam.
• Community projects on diet and physical activity in several Pacific island countries.

Guidelines for the monitoring of community-based interventions have been produced to facilitate implementation of these projects.

Working in informal networks has been a tradition over the past years for NCD managers in the Region. Exchange of knowledge and information is passed across the Region in this way. Maintenance of networks is managed by regional organizations. Formalization of such networks can develop into partnerships and coalitions that serve as effective mechanisms in NCD prevention and control. The Philippine Coalition for the Prevention and Control of NCD and the developing Asia Pacific Physical Activity Network are examples. In 2005 the South-East Asia Network for NCD Prevention and Control was initiated with WHO support.

Clinical preventive services

In populations with established disease, improved control of blood glucose, blood lipids and blood pressure, and use of appropriate treatment such as rennin-angiotensin system (RAS) blockers are associated with marked reduction in morbidity and mortality due to cardiovascular and renal diseases. Furthermore, the use of a multidisciplinary team with particular emphasis on patient empowerment, treatment to target, and periodic assessments can lead to a 50%–70% reduction in mortality, cardiovascular and renal events.38

Although the availability of diabetes education and care programmes will depend both on resources available and current health-care infrastructure, given the highly preventable nature of complications and the cost-effectiveness of many of these interventions it is suggested that all health-care systems, across a wide range of resource levels, should be able to provide the medication, preventive care and counselling to every patient, and educate health-care providers about the importance of these prevention and intervention strategies.

WHO’s Innovative Care for Chronic Conditions (ICCC) Framework (Figure 8.8) outlines the importance of integrating multiple components for patient and family (micro), health-care organizations and community (meso), as well as policy and financing (macro) to make high-quality chronic care possible. This comprehensive system aims to avoid fragmentation of care and emphasizes the need to create a system which works across the disease continuum, spanning health promotion, disease prevention, treatment and rehabilitation. Clinical management and care guidelines have been developed in many countries.
Specific activities on diabetes prevention and control in the Region

There are marked differences between the Asia Pacific Region and more developed regions such as North America and Western Europe. Therefore, there is clearly a need to identify Regional and country specific solutions for coping with the diabetes epidemic. In 2000, the Western Pacific Declaration on Diabetes (WPDD) was developed in partnership with the International Diabetes Federation and the Secretariat of the Pacific Community. The WPDD Action Plan 2000–2005, and more recently the WPDD Action Plan 2005–2010, is a strategic approach to deal with the diabetes epidemic in the Region.

A primary focus of the WPDD lies in its support of educational programmes and conferences to increase regional awareness of diabetes as a priority health issue. These include the Diabetes Leadership Workshop, 3rd Asia Pacific Epidemiology Course, and the 3rd World Congress on Prevention of Diabetes and its Complications. Through these meetings and workshops, the WPDD has trained and communicated with a large number of doctors, nurses, epidemiologists and related health-care workers.
regarding the magnitude of diabetes as a public health problem, and the principles of conducting research and developing education and care programmes in diabetes. Many of these participants have become champions and leaders in their own countries or areas by documenting facts and figures about diabetes, initiating pilot clinical prevention programmes, and lobbying for government support to set up national plans for the prevention of diabetes and its complications.

The WPDD Action Plan strategies have been instrumental in stimulating and supporting Cambodia, China, Cook Islands, Fiji, India, Malaysia, the Marshall Islands, the Federated States of Micronesia, Mongolia, the Philippines, Samoa, Tonga and VietNam to set up diabetes prevention and control activities. In India, studies show that lifestyle modification or use of metformin is effective in preventing diabetes in people with persistent IGT.

Cancer

A leading cause of death worldwide, cancer is a generic term for a group of more than 100 diseases which can affect any part of the body, with lung, breast, colorectal, stomach and liver cancers being the most common. The disease occurs through a pathological breakdown of the processes which control the proliferation, differentiation and death of cells. Malignant cells which form a tumour most frequently arise from the epithelial tissue and are known as carcinoma. More than 70% of all cancer deaths occur in low- and middle-income countries; however, it must be kept in mind that these same countries have a similarly large proportion of the world’s population. Cancer accounts for 13% of all deaths in the Asia Pacific Region with demographic, socioeconomic and other characteristics producing a wide variance in rates between individual countries. It is estimated that in 2000 there were 4.3 million cases and 2.9 million deaths from cancer in the Region, with lung cancer the most common.

Cancer incidence and mortality is shown in Figure 8.9.

![Figure 8.9: Cancer incidence and mortality by sex and site of cancer in the Asia Pacific Region, 2000](image-url)

**Major types of cancer**

The age-standardized incidence of lung cancer in males per 100 000 population ranges from 53 in Korea and 42 in China to less than 10 in India and Sri Lanka. Tobacco smoking causes a wide range of cardiovascular and respiratory diseases, including cancer of the lungs and other organs. If strong anti-tobacco measures within the WHO Framework Convention on Tobacco Control are not properly implemented, it is anticipated that lung cancer rates will continue to rise. Prevention is critical as therapy for lung cancer is irrelevant and early detection is not useful.

Stomach cancer is another common cancer in the Asia Pacific Region, largely caused by *Helicobacter pylori* infection. The path of transmission of *Helicobacter* infection is still unclear. High consumption of salt and salted, smoked, pickled and preserved food is another cause, but the introduction of refrigerators in Japan reduced the use of traditional preservatives and thereby rates of stomach cancer. The prevalence of stomach cancer in China is likewise dropping due to better methods of food preservation. Preventive measures include improving the quality of food and lowering salt intake. Stomach cancer rates range from less than 70 per 100 000 in China, Japan and South-East Asia to less than 6 per 100 000 in India and Sri Lanka. In these countries, the disease carries a very high mortality due to lack of access to early diagnosis.

Liver cancer is the third major cancer in the Asia Pacific Region, with approximately 470 000 people affected annually. The age-standardized incidence rate per 100 000 people for liver cancer ranges from 100 to less than 15. More than two thirds of liver cancer cases occur in men. Since it is invariably lethal, the number of deaths due to this cancer is as high as the incidence. While liver cancer is predominantly caused by hepatitis B infection, in countries such as Japan hepatitis C infection is a significant cause. The incidence of liver cancer is likely to drop over the next 20 years through higher immunization coverage for hepatitis B, and when the vaccine eventually becomes available it should drop for hepatitis C. Most of the middle-income countries and some least-developed ones in the Region have included immunization against hepatitis B as part of WHO’s Expanded Programme on Immunization (EPI). It must be kept in mind that because immunization is carried out in childhood, for routine immunization against hepatitis B to show an impact on the incidence of cancer of the liver it would be necessary to wait for the immunized cohort to reach the age when cancer of the liver manifests itself. Even in countries where there is low endemicity of hepatitis, chronic alcoholism predisposes heavy drinkers to liver cancer. Aflatoxins in food also enhance the risk of liver cancer.

Breast cancer is the most common cancer among women in the Asia Pacific Region. In a few countries in the Region it is second only to cancer of the uterine cervix. Age-standardized rates range from 92 per 100 000 in New Zealand to less than 20 per 100 000 in China and India. Breast cancer is intimately related to a high-calorie diet, lack of exercise and reproductive factors. Early detection through proper screening and improvements in therapy have reduced mortality. Unfortunately, early detection and therapy are inaccessible to large segments of the population in the Region.

Cancer of the uterine cervix is another major disease affecting women and is caused by sexually transmitted *Human papillomavirus* (HPV) infection. It is also associated with socioeconomic conditions. While the age-standardized incidence in India is above 30 per 100 000 population, it is less than 10 per 100 000 in China and Australia. Rates are dropping in India due to improved socioeconomic conditions. Further improvement requires the introduction of an active screening programme, such as the cytological Pap test or visual inspection with acetic acid (VIA). Survival can be improved considerably by early detection linked with radiotherapy treatment, but developing countries lack the financial resources to carry out such a cytological screening programme. Alternative methods more suitable for low-resource countries, such as VIA followed by cryotherapy, are under investigation.
Cancer of the oral cavity caused by chewing tobacco ranks among the three most common types of cancer in south-central Asia. Tobacco is chewed alone or with lime, betel leaf, betel nut and other compounds as a combination called paan, a local combination used with or without tobacco now being replaced largely by pre-packed pan masala granules. Both paan and paan masala, especially when they contain tobacco, can lead to corrosion of the oral mucosa, leukoplakia or submucus fibrosis, and eventually, cancer. Legislation on tobacco in many countries has been silent on use and sale of these products. Countries with the greatest burden of oral cancer in men are Papua New Guinea, Solomon Islands and Sri Lanka.

The data as presented above serve to highlight the fact that the distribution of types and sites of cancer vary greatly from country to country. This difference has also been demonstrated in different parts of the same country. India has generated good data on the distribution of types of cancer by its network of cancer hospital and community-based registries and shows a very marked difference in the type of cancer found in different states. Such data have value in planning education and awareness programmes specific and relevant to the local situation.

**Risk factors for cancer**

Tobacco use remains the major preventable risk factor for cancer. In other parts of the world, active and passive tobacco smoking is the main cancer risk, but in the Asia Pacific Region the widespread use of chewing forms of tobacco is a leading cause of oral cancer. In parts of China and South-East Asia, and especially in north-west India, Indonesia, Malaysia and Singapore, there are high rates of nasopharyngeal cancer, with the main causal factors being smoking and alcohol. The Region bears a heavy burden of cancer due to various acute and chronic infections. This includes endemic liver cancer due to hepatitis B and C. There is a very high incidence of stomach cancer in China, Japan, Mongolia and the Republic of Korea largely due to *Helicobacter pylori* infection.

In South Asia, cancer of the uterine cervix due to HPV infection is prevalent. Two other major risk factors—alcohol and improper diet—are of importance in the Region. Heavy alcohol consumption is a major risk factor for cancers of the oral cavity, larynx, pharynx, oesophagus, liver and breast. It is estimated that alcohol consumption results in 5% of attributable cancer deaths in low- and middle-income countries. Diet-related cancers, such as breast, colon and cancer of the prostate, have shown only a mild increase during the last decade.

**Strategies for cancer control**

Approximately 40% of cancers could be avoided through primary prevention by avoiding or reducing risk, and one third could be cured if diagnosed early. Those with incurable cancers should receive appropriate palliative care, but there are several constraints to achieving these goals. Effective cancer control requires a comprehensive national cancer control policy and programme with adequate resource allocation, development of diagnostic and therapeutic capacity, and good resource utilization in palliative care. High levels of female illiteracy, gender discrimination and other forms of socioeconomic inequalities, as well as poor enforcement of tobacco, alcohol and other food and drug legislation hinders the efforts of cancer control programmes in many countries in the Asia Pacific Region.

The WHO Strategy for Prevention and Control of Cancer aims to reduce the cancer burden and risk factors and improve the quality of life of patients and their families. In 2005, the 58th World Health Assembly adopted Resolution WHA58.22 on cancer prevention and control, which calls for the reinforcement of national cancer prevention and control programmes and integrating them with
health systems, strengthening information systems (like cancer registries), and ensuring the availability of opiate analgesics. Table 8.5 compiles the information on major strategies available for prevention and control of eight common cancers occurring in the Asia Pacific Region.

Cancer registries, either hospital- or community-based, such as those set up in India, serve an important preventive role as they provide information about the area-specific prevalence of different types and locations of cancer. This knowledge is important not only for advocacy but can also ideally be used to develop evidence-based intervention programmes.

Table 8.5 Assessment of strategies for eight common cancers

<table>
<thead>
<tr>
<th>Site of cancer</th>
<th>Prevention Effectiveness</th>
<th>Prevention Cost</th>
<th>Early detection Effectiveness</th>
<th>Early detection Cost</th>
<th>Curative therapy Effectiveness</th>
<th>Curative therapy Cost</th>
<th>Palliative care Effectiveness</th>
<th>Palliative care Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouth/pharynx</td>
<td>++</td>
<td>$</td>
<td>-</td>
<td>$</td>
<td>+</td>
<td>$</td>
<td>++</td>
<td>$</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>+</td>
<td>$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>$</td>
</tr>
<tr>
<td>Stomach</td>
<td>++</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>+</td>
<td>$</td>
<td>++</td>
<td>$</td>
</tr>
<tr>
<td>Colon/rectum</td>
<td>++</td>
<td>$</td>
<td>+</td>
<td>$</td>
<td>+</td>
<td>$</td>
<td>++</td>
<td>$</td>
</tr>
<tr>
<td>Liver</td>
<td>++</td>
<td>$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>$</td>
</tr>
<tr>
<td>Lung</td>
<td>++</td>
<td>$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>$</td>
</tr>
<tr>
<td>Breast</td>
<td>+</td>
<td>$</td>
<td>++</td>
<td>$</td>
<td>+</td>
<td>$</td>
<td>++</td>
<td>$</td>
</tr>
<tr>
<td>Cervix</td>
<td>+</td>
<td>$</td>
<td>++</td>
<td>$</td>
<td>+</td>
<td>$</td>
<td>++</td>
<td>$</td>
</tr>
</tbody>
</table>

++ Effective; + partly effective; - largely ineffective
$ Less expensive; $$ more expensive


Primary prevention

Childhood immunization against hepatitis B is the most cost-effective strategy to prevent adult mortality from liver cancer. Several vaccines have been developed for cervical cancer caused by HPV. The safety profiles of these vaccines are very good and the immunity produced has been found to be satisfactory in prevention of the disease. Broad introduction of HPV vaccine, especially in low-resource settings, is hindered by its high cost and other challenges in implementing vaccination programmes.

Tobacco use, a common cause of cancer in the Region, accounts for 18% of disability-adjusted life years lost. Tobacco use, a common cause of cancer in the Region, accounts for 18% of disability-adjusted life years lost. Two forms of tobacco use, chewing and smoking, are highly prevalent in the Region and each cause cancer in different parts of the body. While cigarette smoking is prevalent in China and many South-East Asian countries, chewing tobacco is predominant in Central and South Asia. Oral tobacco use is also associated with cancer of the oral cavity, whereas smoking tobacco causes cancer of the lung, larynx, pancreas, stomach, bladder and cervix. The long-term strategy for control of tobacco-related cancer involves education, advocacy, and legislative and fiscal measures.

Colorectal cancer is another cancer in which primary prevention is feasible through improvement in diet and related lifestyle modifications. The risk for colorectal cancer can be reduced by limiting meat consumption and increasing intake of vegetables and fruits. The major difficulty in shifting to a healthy diet is the rising cost and inadequate availability of vegetables and fruits. This shortage could be mitigated by better horticultural and marketing practices. Lack of physical activity is another risk
factor for colorectal cancer. With socioeconomic advancement, there is a tendency to refrigerate food in middle- and upper-class households. This may reduce stomach cancer rates attributed to salted, pickled and preserved food. A joint programme for control of chronic diseases aimed at lowering salt consumption can reduce hypertension as well as stomach cancer.

**Early detection of common cancers**

For many cancers such as those of the lung, oesophagus, stomach and liver, early detection is of no significant value. Three types in which early detection has proven value are oral cavity, breast and cervical cancers. Only in the case of oral cancer has a feasible and cost-effective screening strategy been developed. The adoption of this strategy could prevent at least 37 000 deaths worldwide every year.54

Mammography is the gold standard for early detection of breast cancer. It can reduce mortality by up to one third among women age 50–69.55 But mammography is a high-cost, technology-intensive screening procedure beyond the reach of most developing countries. Monthly self-examination of the breast and periodic breast examination by trained technical personnel have demonstrated a marginal improvement in survival rates. Even though such screening may not yield detection rates as high as mammography, it can certainly lead to earlier detection and thereby provide a better chance of a cure.

Cytology-based screening and treatment programmes have reduced cervical cancer incidence and mortality by as much as 80% in North America and the Nordic countries of Europe.56 Broad implementation of this approach in the Asia Pacific Region is hindered by financial constraints and inadequate health infrastructure and outreach. Alternate strategies like visual inspection with acetic acid are being proposed. To implement such a programme on a national scale, the investment in basic health infrastructure, including human resources and facilities, is considerable, as a substantial proportion of women may require further colonoscopy, biopsy, Pap smear, cryosurgery or close follow-up for which the services of pathologists, gynaecologists and health workers are essential.

Early detection of colorectal cancer, which is predominant in East Asia, is a formidable challenge. Even though primary prevention would be the long-term goal, early detection and therapy should be considered as an appropriate approach, since many countries have adequate resources and good health system infrastructure. Colonoscopy is the preferred method of early detection of colorectal cancer. As colonoscopy is impractical for screening of asymptomatic individuals, it should be restricted to a subpopulation of people over age 50, identified through a risk-factor questionnaire. Screening with faecal occult blood test, which is more acceptable, requires further evaluation in settings where it is proposed for use.

Early diagnosis in symptomatic populations depends upon raising awareness of early warning signs and symptoms of various types of cancer, and motivating people to seek early examination, investigation and treatment. This approach is particularly successful when used to detect mouth, cervix and breast cancer, which contribute to 50% of the cancer burden.

**Therapy for cancer**

Among the major cancers occurring in the Asia Pacific Region, early treatment is of value in cancers of the head and neck, colon and rectum, breast, and cervix. There are several other tumours where early treatment results are excellent, such as childhood cancer and germ cell tumours. The predominant forms of cancer treatment are surgery, radiation and chemotherapy. The type of cancers which are
curable, with their approximate load in India and modality of treatment, are given in Table 8.6. Palliative care should be extended to people with advanced stages of cancer that cannot be treated by presently available modalities.

The major difficulty in the management of cancer in the Region is the inaccessibility of treatment and care due to geographical and financial constraints. Countries such as Bangladesh, Bhutan and Timor-Leste have very little access to either radiotherapy or other modern cancer treatment services. Specialists are few and tend to be located in metropolitan areas. In the absence of appropriate financial mechanisms and protection, out-of-pocket payments for the treatment of cancer can devastate families and individuals. The cost of installation and maintenance of equipment stands in the way of equitable radiotherapy service. The recent manufacture in India of new cobalt units under US$ 200 000, is expected to help fill this gap. The Chinese linear accelerator programme already provides access to radiotherapy for many people. The introduction of Indian and Chinese generic drugs has improved the affordability of cancer chemotherapy in the Region.

### Table 8.6 Curable cancers for which treatment is justifiable, India

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Load %</th>
<th>Primary modality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childhood cancer</td>
<td>5</td>
<td>CT/S/RT</td>
</tr>
<tr>
<td>Breast</td>
<td>20</td>
<td>S/RT/CT/HT</td>
</tr>
<tr>
<td>Cervix</td>
<td>18</td>
<td>RT/S</td>
</tr>
<tr>
<td>Oral</td>
<td>11</td>
<td>RT/S</td>
</tr>
<tr>
<td>Gestational trophoblastic disease</td>
<td>1</td>
<td>CT</td>
</tr>
<tr>
<td>Germ cell tumours</td>
<td>3</td>
<td>CT/S</td>
</tr>
<tr>
<td>Colon</td>
<td>7</td>
<td>S/CT</td>
</tr>
<tr>
<td>Osteosarcoma</td>
<td>2</td>
<td>CT/S</td>
</tr>
<tr>
<td>Soft tissue sarcomas</td>
<td>2</td>
<td>S/RT</td>
</tr>
<tr>
<td>Central nervous system</td>
<td>2</td>
<td>S/RT</td>
</tr>
<tr>
<td>Total</td>
<td>71</td>
<td></td>
</tr>
</tbody>
</table>

CT- chemotherapy, S – surgery, RT – radiotherapy, HT – hormone therapy


### 8.2 Chronic noncommunicable diseases and the WHO Framework Convention on Tobacco Control

#### The tobacco epidemic

Chronic noncommunicable diseases accounted for almost 60% of global deaths and 47% of the global burden of disease in 2005. The global tobacco epidemic is the second major cause of all deaths from NCD, and the fourth most common risk factor for disease worldwide; and is responsible for almost five million deaths in 2006, mostly in low- and middle- income countries. If current smoking
patterns continue, almost 10 million deaths will result annually by 2025. Half of the 650 million who smoke today will eventually be killed by their habit. In the Asia Pacific Region alone, about 6000 people a day die prematurely from tobacco-use related diseases, a death toll of 2.3 million annually. In addition, millions of nonsmoking adults and children in the Region are exposed to tobacco smoke pollution (also known as second-hand smoke and environmental tobacco smoke), which causes death, disease and disability.

The economic costs of tobacco use are equally devastating. In addition to the high public health costs of treatment, tobacco-caused diseases kill people at the height of their productivity, depriving families of breadwinners and nations of a healthy workforce. Globalization of the tobacco epidemic has been instigated by the tobacco industry which targets youth and disadvantaged groups and takes advantage of weak control measures and a lack of public awareness of the dangers of tobacco use, especially in developing countries.

**Tobacco use patterns**

Compared with other regions the Asia Pacific Region has the greatest number of smokers, estimated at 661.6 million; the highest rates of male smoking prevalence and the fastest increase in tobacco use by women and young people. In most countries, tobacco use is more prevalent among the poor and disadvantaged segments of the population.

While cigarette smoking predominates, a variety of tobacco products are consumed in the Region. Tobacco is chewed, sucked, sniffed and gargled using zarda, khaini, betel leaf, gutkha, gul, mawa, betel quid and mishri. There are specific indigenous smoking products such as bidis and hukkas/hookahs (hubble bubble) in India and Bangladesh, kreteks in Indonesia, and cheroots and bamboo waterpipes in Cambodia, the Lao People’s Democratic Republic, Myanmar and Viet Nam, and betel nut chewed with tobacco in many Micronesian countries as well as Papua New Guinea and Palau. In some countries, various tobacco products are combined or have supplanted other forms of tobacco use. For example, in India there has been an overall reduction in the use of bidis and cigarettes but an increase in smokeless tobacco use in rural areas. There is also use of shisha waterpipes (also known as hookahs, bhangs or nargiles) in nightclubs and restaurants in Brunei Darussalam, India, Malaysia and Thailand.

Smoking prevalence has decreased in the past decade in developed countries such as Australia, Japan, New Zealand and the Republic of Korea. In less than five years cigarette smoking among Korean men dropped from 61.8% to 52.8%, one of the most significant declines worldwide. Tobacco prevalence is still very high among men in the Region (up to 45% in some areas), with smoking rates as high as 60%–70%. Smoking is increasing in developing countries, and among young women and youth in some countries. Tobacco use among women is as low as 3%–4% in the Region, but there are several notable exceptions. For example, 50.8% of women in Nauru smoke tobacco daily. In many other Pacific island countries the majority of women smoke or use other tobacco products. Tobacco use, especially smoking among young women, appears to be increasing in many countries including China, Malaysia, the Republic of Korea and many Pacific island countries.

In the Region boys are significantly more likely than girls to smoke cigarettes. In 7 of 29 sites within the Region (i.e., WHO Member States and their populations) included in the Global Youth Tobacco Survey, 15% or more students aged 13–15 years currently use tobacco products other than cigarettes. Similarly, 25% or more of the youth surveyed currently use cigarettes in 7 of 29 sites. However, these figures may be misleading as some countries in the Region have not yet surveyed youth tobacco use and the Global Youth Tobacco Survey is not representative of all youths aged 13–15 from participating countries. In Thailand, 19.3% of youth currently use tobacco products and 13.8%
smoke cigarettes. In Cook Islands, current cigarette use prevalence among girls is 49.6%; and in Papua New Guinea, current cigarette use prevalence among boys is 52.1%, the highest in the Region. Only 1.2% of youth aged 13–15 in Hanoi, Viet Nam, currently smoke cigarettes.

In general, smoking by youth in the Asia Pacific Region is increasing and the average age at which people begin smoking is dropping from the early twenties to the teens. However, youth smoking rates are beginning to fall in countries where effective tobacco control measures have been implemented. In the Philippines following enforcement of municipal smoking bans, male youth current cigarette smoking prevalence declined by approximately one third, from 32.6% in 2000 to 21.8% in 2003. Among adolescent girls the decline was similar, from 12.9% in 2000 to 8.8% in 2003. However, according to the 2007 Global Youth Tobacco Survey data, current cigarette smoking prevalence among male and female youth increased to 23.4% and 11.8%, respectively. Reasons for this increase are currently being explored. The Republic of Korea instituted consecutive tax increases over a five-year period and introduced health education campaigns, which may have contributed to cutting male youth smoking in half from 35.3% in 1997 to 15.9% in 2004.

**Exposure to tobacco smoke pollution**

Exposure to tobacco smoke pollution increases non-smokers’ frequency of chronic respiratory conditions and raises their risk of acute coronary artery diseases by 25%–35%. Evidence links tobacco smoke pollution to other adverse health effects in adults, including exacerbation of asthma and reduced lung function. Small children whose parents smoke at home have a greater risk of suffering lower tract respiratory infections, inner ear infections, more frequent and severe asthma episodes, and the risk of Sudden Infant Death Syndrome (SIDS).

People’s exposure to tobacco smoke pollution in the Region, especially children, is staggeringly high. Most are involuntarily exposed inside their homes or in public places. In Jakarta, over 81.6% of children aged 13–15 are exposed to tobacco smoke pollution in public and almost 66.8% in their homes. A seminal 1981 Japanese study found that non-smoking women married to men who smoke had significantly increased risk of lung cancer compared to non-smoking women married to non-smoking men. In China a study found that exposure to tobacco smoke pollution kills as many women as does smoking; and estimated that in 2002, 48 400 women died from lung cancer and ischaemic heart disease attributed to exposure to tobacco smoke pollution compared with 47 300 lung cancer and heart disease deaths from smoking.

**Burden of tobacco use**

World Bank estimates in 1993 showed that the global net social cost of smoking—factoring in the net social benefit of smoking—was US$ 200 billion each year. This huge economic burden is now shifting from developed countries to developing countries. About 75% of today’s tobacco users live in developing countries, and most live in the Asia Pacific Region. By 2030, developing countries will account for 70% of all tobacco deaths.

Globally, tobacco use tends to be higher among groups with less education and less income and this holds true for most of the Asia Pacific Region. Poorer households spend a greater percentage of their income on tobacco than wealthier ones, and often children suffer most. Research from a broad range of countries shows that as much as 25% of household income is spent on tobacco and is given priority over other basic necessities of life, including food, clothing, health care and education. In Viet Nam, for example, tobacco spending is often 1.5 times higher than that for education, five times
higher than health-care expenditures, and is one third of food budgets.\textsuperscript{53} In China’s Minhang district, smokers spent 17\% of household income on cigarettes.\textsuperscript{54} In Bangladesh, for example, money spent on tobacco is about 5\% of total household expenditure. Poor people spend proportionately more compared to rich people and suffer and die more as a consequence of tobacco-related diseases.\textsuperscript{55} Even homeless children in India spent a significant portion of their income purchasing tobacco, often prioritizing it over food.

Tobacco-related illnesses account for 16\% of deaths in Bangladesh among people aged 30 and above. Of all hospital admissions for this age-group one quarter are due to tobacco-related illnesses, which imposed a net cost of US$ 442 million on the economy in 2004.\textsuperscript{56} Table 8.7 shows the relative risk and population attributable risk of smoking two different forms of tobacco on selected NCD in Bangladesh.

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Smoking tobacco</th>
<th>Non-smoking tobacco</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RR</td>
<td>PAR (%)</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>1.5</td>
<td>21.4</td>
</tr>
<tr>
<td>Stroke</td>
<td>1.2</td>
<td>10.7</td>
</tr>
<tr>
<td>Buerger’s disease</td>
<td>28.1</td>
<td>93.4</td>
</tr>
<tr>
<td>Oral cancer</td>
<td>4.8</td>
<td>66.3</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>5.3</td>
<td>69.8</td>
</tr>
<tr>
<td>Laryngeal cancer</td>
<td>10.0</td>
<td>82.7</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>3.0</td>
<td>52.5</td>
</tr>
</tbody>
</table>

Source: Impact of tobacco-related illnesses in Bangladesh. New Delhi, WHO Regional Office for South-East Asia, 2007.

In India about one million people die every year due to tobacco-related diseases. In the Philippines, researchers have conservatively estimated total annual costs of illness for just four smoking-related diseases—cerebrovascular diseases, coronary artery disease, chronic obstructive pulmonary diseases and lung cancer—at US$ 2.86 billion, while real costs may be as high as US$ 6.05 billion each year.\textsuperscript{57}

Tobacco use-related impairment of fetal nutrition, resulting in low birth weight, may be another vascular risk factor relevant to the Asia Pacific Region. It has been implicated in the causation of metabolic syndrome and diabetes, as well as in the mediation of vascular risk through other risk factors such as high blood pressure. The association may have profound effects on the incidence of diabetes and cardiovascular diseases in parts of the Region where tobacco use-related fetal malnutrition is common.

Progress of the WHO Framework Convention on Tobacco Control in the Asia Pacific Region

The challenge to public health is to avert this epidemic and its severe socioeconomic effects by prompt implementation of effective interventions through a proper, legally binding international framework. In response to the global tobacco epidemic, WHO Member States adopted the first global
tobacco control treaty—the WHO Framework Convention on Tobacco Control (WHO FCTC)—in May 2003. The objective of the treaty is to “protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke” by reducing tobacco use prevalence and exposure to tobacco smoke pollution through measures at the national, regional and international levels. The treaty entered into force on 27 February 2005, and as of March 2007 over 140 countries had ratified it, making it one of the most rapidly embraced treaties of all time.

In contrast to previous drug control treaties, the Framework Convention asserts the importance of demand reduction strategies as well as supply issues. The Framework Convention will help reduce tobacco use and exposure to tobacco smoke pollution in a number of ways. These, among other things, include the following:

- protect young people from exposure to tobacco use and from using tobacco;
- prevent people from taking up smoking, and help those who want to quit;
- ban smoking in public places and transportation;
- take steps to promote economies that are not dependent on tobacco products;
- strengthen women’s roles in tobacco control;
- aid countries by teaching people about the dangers of tobacco; and
- protect communities most vulnerable to tobacco, especially indigenous populations.

Asia Pacific countries played an active role in all stages of the Framework Convention process from the beginning of initial negotiations to the adoption and ratification of the treaty. As of January 2007, 36 of 38 WHO Member States in the Region have become Contracting Parties to the Convention, indicating strong support and commitment to the treaty.

Several countries in the Asia Pacific Region now have comprehensive national tobacco control legislation conforming to the provisions of the Framework Convention. Australia, Bangladesh, Brunei Darussalam, India, Singapore, Malaysia, Myanmar, New Zealand, the Philippines, the Republic of Korea, Sri Lanka, Thailand and Vietnam have undertaken significant efforts to control tobacco use though comprehensive legislation while others are in the process of developing legislation. All countries are putting in place necessary administrative, infrastructural and legislative measures, in line with the provisions of the Convention. Some countries in the Region have integrated several elements, linking tobacco control activities to NCD prevention.

**WHO Framework Convention and its linkage to noncommunicable diseases**

Globally, NCD are increasingly recognized as a major cause of morbidity and mortality. According to the 2005 WHO global report *preventing chronic diseases: a vital investment*, global action to prevent chronic disease could save 36 million people who would otherwise die by 2015. Underlying determinants for NCD in the Region are rapid ill-planned urbanization, expanding industrialization, rising incomes, globalization and ageing population. The rapid pace of change is resulting in a high prevalence of common behavioural risk factors, namely, tobacco use, alcohol abuse, unhealthy diets and physical inactivity.

Tobacco use combined with exposure to second-hand smoke is the major component for NCD risk factors, and its control would greatly benefit the Region. Numerous studies reveal that tobacco cultivation and use is harmful to a country’s economy and the health costs associated with tobacco
use far outweigh any revenues. The WHO Framework Convention is the most effective tool to reduce 
tobacco consumption and can significantly reduce morbidity and mortality from NCD. Reducing tobacco 
use significantly reduces health-care expenses, money that could be spent to promote healthy lifestyles 
which provide greater workforce productivity and beneficial national economic gains.

**Box 8.1: Thailand: pioneering tobacco control**

Thailand has one of the strongest and most comprehensive tobacco control laws and measures 
in the Asia Pacific Region, with provisions of the Framework Convention and tobacco control 
best practices comprehensively reflected in its tobacco control measures. The salient features 
of best practices are:

- Total bans on advertising, promotion and sponsorship, such as direct advertising, point-of-
sale advertising, product placement in all media and trademark diversification.
- Ban on all forms of promotion, e.g. free giveaways, exchanges, rebates, discounts, free 
  premiums and others.
- Limit youth access through prohibition of sales to minors less than age 18, and a ban on 
cigarette vending machines.
- Disclosure of the constituents and emissions of products to the Ministry of Public Health; 
  Thailand being one of only two countries in the world to have such a section of the law.
- Labelling of cigarette packages with six rotary pictorial health warnings, making Thailand 
  the fourth country in the world to have such graphic warnings.
- Prohibition on import, production and sale of smokeless tobacco products.
- Prohibition on import, production and sale of hookah.
- Comprehensive smoking ban in public places and workplaces, including all public transport, 
cinemas, stores and air-conditioned restaurants.
- Strong presence and advocacy by civil society organizations, including foundations, institutes 
  and nongovernmental organizations for tobacco control.
- Taxes from tobacco used for anti-tobacco and other health promotion activities.

**Conclusions and recommendations**

The Framework Convention is inextricably linked to future efforts to prevent NCD and effective 
implementation of the Convention and strict enforcement of tobacco control measures will significantly 
reduce their incidence.

Formidable challenges lie ahead in reducing illness and death from tobacco use in the Asia Pacific 
Region due to pervasive poverty and resource constraints in many countries. As the tobacco industry 
actively obstructs public health initiatives and efforts to reduce tobacco use, it is crucial that public 
education and advocacy for a healthy lifestyle, including campaigns against tobacco use, are intensified.
8.3 Injuries and violence

Injuries caused an estimated 5.2 million deaths worldwide, 9% of total, and resulted in 182 million DALYs lost in 2002, the latest year for which complete data are available. If current trends continue, road traffic and intentional injuries (self-inflicted injuries or suicide, and interpersonal violence) will rank among the 20 leading causes of death by 2030 (Table 8.8).

Table 8.8 World rankings of injury-related mortality in 2002 and 2030

<table>
<thead>
<tr>
<th>Type of injury</th>
<th>Ranking in terms of the number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 2002</td>
</tr>
<tr>
<td>Road traffic injuries</td>
<td>10</td>
</tr>
<tr>
<td>Self-inflicted injuries</td>
<td>14</td>
</tr>
<tr>
<td>Interpersonal violence</td>
<td>21</td>
</tr>
</tbody>
</table>


In the Asia Pacific Region it is estimated that injuries caused about 2.7 million deaths in 2002, or over 7000 deaths daily, which constituted 52% of worldwide injury deaths. The injury burden amounted to some 92.5 million DALYs lost in the Region in 2002, 51% of the global total (Table 8.9). Low- and middle-income countries have higher injury-related mortality rates than high-income countries. The 5-44 age group accounted for 55% of injury-related mortality. In 2002, the major causes of injury deaths in the Region were due to road traffic (an estimated 600 000 deaths), self-inflicted injury or suicide (577 000), falls (237 000), drowning (230 000), burns (204 000), interpersonal violence (179 000), and poisoning (170 000). Unintentional injuries and those due to violence are significant public health problems in the Region.

Table 8.9 Injury-related mortality and burden of disease in the Asia Pacific Region in 2002

<table>
<thead>
<tr>
<th>Mortality</th>
<th>Burden of disease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of deaths (thousands)</td>
</tr>
<tr>
<td>All types of injuries</td>
<td>2 696</td>
</tr>
<tr>
<td>Road traffic injuries</td>
<td>600</td>
</tr>
<tr>
<td>Self-inflicted, suicide</td>
<td>577</td>
</tr>
<tr>
<td>Falls</td>
<td>237</td>
</tr>
<tr>
<td>Drowning</td>
<td>230</td>
</tr>
<tr>
<td>Burns</td>
<td>204</td>
</tr>
<tr>
<td>Interpersonal violence</td>
<td>179</td>
</tr>
<tr>
<td>Poisoning</td>
<td>170</td>
</tr>
</tbody>
</table>

Mortality and DALYs lost due to road traffic injuries, self-inflicted injuries, drowning and burns in the Region were almost equal to or more than 50% of the respective world totals. The Asia Pacific Region has a very high burden of injuries compared to other regions.

In response to these injury-related problems, some governments (e.g. China, Mongolia, Myanmar, Thailand, Sri Lanka and Viet Nam) have developed national policies, plans and programmes for injury prevention and others have started public awareness programmes. However, there are still many challenges faced by developing countries of the Region in solving injury problems. These include insufficient awareness and understanding of the magnitude and cause of injuries; lack of national policies and plans for injury prevention; and limited national capacity to collect and analyse injury data and design and implement effective interventions.

**Road traffic injuries**

Road traffic is a major cause of injuries and deaths throughout the Asia Pacific Region. Pedestrians, bicyclists and motorcyclists are the most vulnerable road users and suffer the majority of fatalities and injuries. In most countries where rapid motorization is taking place, road traffic injuries are correspondingly rising in number and severity. Besides the ever-increasing number of cars and motorcycles other factors contributing to rising road traffic injuries include speeding; driving under the influence of alcohol; the lack of helmets, seat-belts, child restraints and other protective measures; mixed motorized and non-motorized transport; and poor road infrastructure and signage.

Many developing countries in the Region have recently passed, or are in the process of passing, legislation that mandates the use of helmets and seat-belts, sets speed limits and safety standards for motor vehicles, prohibits drinking and driving, and requires the use of daytime headlamps by motorcyclists. Legislation for child restraints may soon follow. However, law enforcement is not always successful.

In collaboration with the Asian Development Bank, countries of the Association of South East Asian Nations (ASEAN) developed national action plans for road safety in 2004 and have begun to implement them. Each country takes a multisectoral approach to road safety, involving transport, police, education, health and other departments. In Thailand, for example, a nationwide multisectoral project is piloted at the provincial level to promote motorcycle safety. Another multisectoral project promotes the use of motorcycle helmets for children aged 2–14 and focuses on three major components of behaviour modification: a predisposing factor (risk communication and education for appropriate use of motorcycle helmets); an enabling factor (production of child motorcycle helmets and availability in the pilot area); and a reinforcing factor (control and monitoring by families, schools, society and the police of the appropriate use of motorcycles and helmets for children).

The health sector is intensely involved in improving injury surveillance and emergency medical care systems and advocating for prevention and behavioural changes for motorists and non-motorist road users. The presence of an emergency response system that reaches the site of a road accident swiftly, provides on-the-spot immediate initial care and arranges for the safe transport of patients to properly equipped trauma units can save lives and minimize disability. Such networks are being established in some of the larger metropolitan areas in the Region.
In other developing countries, the multisectoral approach to road safety has become popular. In China, the ministries of public security, health, and communication have increased collaboration in reducing road traffic injuries and deaths. An alliance involving these government departments and the private sector has also been formed to tackle the increasing risk of road traffic to human health and lives.

The United Nations Road Safety Week, coordinated by WHO, has strongly supported multisectoral coordination to prevent road traffic injuries.

**Suicide**

Suicide is a major cause of injury deaths in the Asia Pacific Region and is often related to a state of impaired mental health or depression. Different social and economic factors affect the mental state of people and rates of suicide. The availability of poisons (e.g. pesticides and harmful substances) is linked to the occurrence of suicide. (Further discussion on this issue is provided in this publication’s section on mental health.)

Research and investigation in the Region have shown that depression is not as strong a causal factor in suicide as impulse, and this link should be systematically explored to provide guidance for an appropriate response, including focusing attention on reducing access to the means of suicide.

Regarding interventions, programmes which screen for those at high risk can also create stigma that lowers compliance. Researchers should seek population-wide positive approaches for prevention.

Other innovative approaches are also being tried. For example, with the collaboration of nongovernmental organizations India has established telephone help lines for the depressed in many large urban areas.

**Drowning**

Drowning is a leading cause of death in children under the age of 15 in many countries including Bangladesh, China and Thailand.\(^5\) It is the most common cause of unintentional deaths in Bangladesh and Maldives. Most drowning deaths take place in ponds, rivers and oceans, or during floods and typhoons. Very few are related to swimming pools.

Since victims of drowning have a slim chance of survival after immersion, prevention strategies are important. Limiting access by fencing off deep bodies of water has proven effective, but is not always possible. Drowning deaths during water recreation can be prevented by adult supervision of children, swimming instruction, and the training of lifeguards.

For surface water transport, legislation and enforcement of provisions for personal flotation and other lifesaving devices, and avoidance of overloading can prevent mass casualties. In the case of floods and storms, preventive measures include early warning and evacuation to safer places and prompt rescue activities.

**Burns**

Burns are a major injury problem in Asia, particularly in South Asia. The majority of burns occur at home. The risk factors associated with burns include cooking on open fires, explosion of pressure stoves, instability of small stoves, use of open fires to keep warm during winter, and the use of inflammable materials in housing and furnishings. Housing and clothing fires are the most severe events but not as frequent as scalds from hot liquids. Use of fireworks during festivals and celebrations
is common in Asia and leads to a significant number of burn injuries. Multiple deaths also occur each year from fires and explosions in factories and homes that manufacture fireworks. The lack of adequate treatment of burns in developing countries is also a factor that increases the severity of the injury.

Effective prevention interventions include promotion of more stable stands for lamps and stoves; installation of smoke detectors, fire alarms and extinguishers in houses and buildings; the provision of clear access to emergency exits, banning or strictly controlling the use and sale of fireworks, increased use of flame-retardant fabrics and materials, and the provision of first aid and treatment of burns. These practices are not common in developing countries and would require appropriate rules and regulations on product safety standards, close monitoring, and education. Improvements to infrastructure for cooking and heating are also likely to reduce the incidence of burns.

Violence

Interpersonal violence—such as child abuse and neglect, violence against intimate partners, elder abuse and homicide—is a major public health problem in the Asia Pacific Region, but its magnitude and causes are not fully known. However, some countries, such as Malaysia, Mongolia, Nepal, Sri Lanka and Thailand have completed a national report on violence and health and other countries are beginning to address the issue.

Effective interventions may include the control of lethal weapons; alcohol and drugs; documentation of cases of violence; advocacy for violence prevention; improved care for victims; promotion of gender and social equity; empowerment of weaker sections of society; and the promotion of life skills in children and parents, such as communication skills and discipline techniques that do not employ physical violence.

8.4 Mental and neurological illnesses and substance abuse

Mental and behavioural disorders are defined in the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) as a set of clinically recognizable behavioural and psychological problems, accompanied by severe and long-lasting distress, disability, or impairment in one or more important areas of functioning, and a significantly increased risk of suffering, pain, disability, loss of freedom, or death. Examples of these disorders include schizophrenia, anxiety and depression. The latter is a condition closely associated with suicide. Mental and behavioural disorders also include mental retardation—characterized by intellectual difficulties that have their onset in childhood—as well as psychosocial problems, such as those related to the use of psychoactive substances and traumatic stress situations. Neurological disorders which cause substantial morbidity and mortality include epilepsy, stroke, Parkinsonism and headache, and are classified elsewhere in ICD-10.

Magnitude of the burden from mental and neurological disorders

Mental disorders do not spare any age, gender, class, social status or cultural group. They are found among rich and poor and in urban and rural areas in all countries. The notion that mental disorders are problems of the rich, industrialized nations is simply wrong, as is the belief that mental disorders do not exist in rural communities because they remain relatively unaffected by the fast pace of modern life.
An estimated 450 million people suffer from mental and neurological disorders worldwide.64 Millions more suffer from so-called sub-threshold disorders, and experience often disabling psychological problems, even when their symptoms do not satisfy the criteria of a psychiatric condition as defined in current classification systems. Surveys conducted in developed as well as developing countries show that at least 2% of the population suffer from the most severe forms of mental disorder, such as schizophrenia, dementia, severe mental retardation and the consequences of brain injuries. Less severe but still disabling forms, such as depressive disorders, anxiety and obsessive-compulsive disorders, affect a further 3%–4% of the population. Mental retardation, often coexisting with other mental disorders, affects a further 2%–3% of the population in several countries. Table 8.10 is a summary of the disease burden of selected major mental disorders in the Asian Pacific Region.

Magnitude of the burden from alcohol abuse

Problems related to alcohol abuse and dependence vary in their frequency and severity among countries, but are reported as a major concern for public health in many countries. Data from the WHO Global status report on alcohol 2004 show that there has been a steady increase in per capita consumption in many countries in the Asia Pacific Region since the mid-1980s. Some developed countries, such as Australia, Japan and New Zealand, have relatively high per capita consumption (6–9 litres of pure alcohol per year for those 15 years of age and above).97 In some developing countries such as China, India, Viet Nam and most countries and areas in the Pacific, per capita consumption is relatively low but increasing rapidly. A recent study conducted on a sample of 3258 individuals drawn from rural, town, slum and urban areas in India found that nearly 33% of the adult population regularly consumed alcohol.98 In China, for example, per capita annual alcohol consumption for those 15 years of age or above was 0.75 litres in 1970 but rose to 4.45 litres in 2001.99

Alcohol is rapidly becoming one of the most significant risks to public health, roughly of the same magnitude as tobacco. Further, changing patterns of drinking—such as binge drinking and more frequent and heavy drinking among young people—tend to lead to more harm. In addition to the impact on public health, there are substantial social and economic costs associated with the harmful use of alcohol. Alcohol-related problems not only affect the individual drinker but have a significant effect on others, including family members, victims of violence and accidents associated with alcohol use, and the community as a whole. The harmful use of alcohol results in considerable expense through lost productivity and costs to the health and welfare, transportation, and criminal justice systems. One estimate puts the yearly economic cost of alcohol abuse in Australia to be around 1% of the gross domestic product.100 It is estimated that the Government of India spends nearly US$ 6.2 billion every year to manage the consequences of alcohol use, which is more than its total excise earning (US$ 5.5 billion).101

Mental health resources

Data from the WHO Mental health atlas 2005 reveals that a mental health policy and substance abuse policy are present in 50%–58% of countries.102 Only about half of all countries have a specified budget for mental health, and even where this exists, it is very often less than 1% of the total health budget. In almost one fifth of all countries, out-of-pocket payments are the primary means for obtaining care, a method which is a significant barrier to continued and adequate care.

The widespread stigma and discrimination against people who are mentally ill makes the provision of mental health care particularly difficult. Stigmatization leads to the rejection of patients and their families by communities and triggers negative discrimination with respect to access to treatment,
housing, employment and health insurance. The stigma attached to mental illness also makes psychiatry an unattractive choice of career for health professionals, which contributes to the continuing shortage of mental health professionals and the inadequacy of mental health services.

Table 8.10 Burden of neuropsychiatric diseases worldwide and in the Asia Pacific Region, 2002

<table>
<thead>
<tr>
<th>Neuropsychiatric disease</th>
<th>World DALYs lost (thousands)</th>
<th>Percentage of total disease burden</th>
<th>Asia Pacific DALYs lost (thousands)</th>
<th>Percentage of total disease burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Unipolar depressive disorders</td>
<td>67 295</td>
<td>4.52</td>
<td>36 501</td>
<td>5.28</td>
</tr>
<tr>
<td>2 Bipolar disorder</td>
<td>13 952</td>
<td>0.94</td>
<td>7 633</td>
<td>1.10</td>
</tr>
<tr>
<td>3 Schizophrenia</td>
<td>16 149</td>
<td>1.08</td>
<td>9 309</td>
<td>1.35</td>
</tr>
<tr>
<td>4 Epilepsy</td>
<td>7 328</td>
<td>0.49</td>
<td>3 420</td>
<td>0.49</td>
</tr>
<tr>
<td>5 Alcohol use disorders</td>
<td>20 331</td>
<td>1.36</td>
<td>8 272</td>
<td>1.20</td>
</tr>
<tr>
<td>6 Alzheimer and other dementias</td>
<td>10 397</td>
<td>0.70</td>
<td>4 722</td>
<td>0.68</td>
</tr>
<tr>
<td>7 Parkinson disease</td>
<td>1 570</td>
<td>0.11</td>
<td>631</td>
<td>0.09</td>
</tr>
<tr>
<td>8 Multiple sclerosis</td>
<td>1 477</td>
<td>0.10</td>
<td>716</td>
<td>0.10</td>
</tr>
<tr>
<td>9 Drug use disorders</td>
<td>7 388</td>
<td>0.50</td>
<td>1 366</td>
<td>0.20</td>
</tr>
<tr>
<td>10 Post-traumatic stress disorder</td>
<td>3 335</td>
<td>0.22</td>
<td>1 841</td>
<td>0.27</td>
</tr>
<tr>
<td>11 Obsessive-compulsive disorder</td>
<td>4 923</td>
<td>0.33</td>
<td>1 837</td>
<td>0.27</td>
</tr>
<tr>
<td>12 Panic disorder</td>
<td>6 758</td>
<td>0.45</td>
<td>3 662</td>
<td>0.53</td>
</tr>
<tr>
<td>13 Insomnia (primary)</td>
<td>3 477</td>
<td>0.23</td>
<td>1 703</td>
<td>0.25</td>
</tr>
<tr>
<td>14 Migraine</td>
<td>7 666</td>
<td>0.51</td>
<td>3 889</td>
<td>0.58</td>
</tr>
<tr>
<td>15 Mental retardation, lead-caused</td>
<td>9 956</td>
<td>0.67</td>
<td>4 837</td>
<td>0.70</td>
</tr>
<tr>
<td>16 Other neuropsychiatric disorders</td>
<td>11 277</td>
<td>0.76</td>
<td>4 399</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>193 278</strong></td>
<td><strong>94 848</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The importance of mental health was recognized by WHO in its Constitution, which states: “Health is not merely the absence of disease or infirmity but rather a state of complete physical, mental and social well-being”. The World health report on mental health: new understanding, new hope, published in 2001, was a landmark in the formulation and promotion of policies and the training of health professionals involved with mental health.

The World health report on mental health recommended, among other actions, that treatment of mental disorders should be provided within the primary health-care setting, psychotropic drugs should be made available, care should be given in the community, the general public should be educated on mental health issues, and that communities, families and consumers be involved in mental health.
The report also emphasized the importance of establishing national policies, programmes and legislation; stressed the need for the development of human resources for mental health care and reiterated the importance of creating links with other sectors and of developing monitoring mechanisms for community mental health and the importance of conducting relevant research.

**Development of community-based mental health systems to meet the essential needs of the community**

Many countries in the Asia Pacific Region have noted that large segments of their population, particularly in rural and remote areas, do not receive appropriate care for people with common neuropsychiatric conditions. Patients are taken to faith-healers instead of doctors. These observations have led to the development of community-based strategies to reach the unreached segments of the population.

In order to illustrate best practices in mental health care in the community through use of information exchange, current evidence and practical experience, WHO has developed the Asia-Pacific Community Mental Health Project. The project was instrumental in the formation of a network of key representatives from ministries of health and organizations working in community mental health in the Region.

**Suicide prevention**

There is a shared view that suicide is a major public health concern in the Asian Pacific Region. The WHO Suicide Trends in At-Risk Countries and Territories (START) project was launched in March 2006 to promote the creation of national databases, and to understand the various types of suicidal behaviour, certify suicide deaths and develop effective interventions.

**Promotion of mental health**

Concepts of mental health promotion, evidence for mental health promotion and strategies to be implemented are being developed throughout the Region. Two settings for mental health promotion activities are being given special attention. The first setting is adolescents, both in school and out of school. The suggested tools for this setting include life skills education, prevention of harm from alcohol and strategies for coping with stress. In the community setting, the recommended tools are building community resilience, prevention of harm from alcohol and using traditional methods such as meditation for coping with stress.

The experiences in the Asia Pacific Region over the past years have indicated that changes in mental health programmes require strong and persistent political commitment, and a reorientation of health systems to include mental health services as an essential component at all levels. Most importantly, substantial improvement of mental health can only be possible when there is a change of attitude towards mental health at both the community and government levels.

**Control of alcohol-related harm**

Growing awareness of the public health impact of the harmful use of alcohol led to action in 2005 at the Fifty-eighth World Health Assembly. Core areas for national action and regional collaboration were identified through consultations with key stakeholders. These include reducing the risk of harmful use of alcohol; minimizing the impact of its harmful use; regulating its accessibility and availability; and establishing mechanisms to facilitate and sustain implementation of the public health-oriented alcohol policy. There is general consensus over the fact that isolated measures such as media campaigns are unlikely to have effect. For effective control of alcohol-related harm a comprehensive and consistent set of measures is
required, involving a wide range of sectors and adapted to the national context. Some countries in the Region, such as Australia, New Zealand, the Republic of Korea and Thailand to mention just a few, have already taken up the challenge to define and implement policies that provide better protection against the harm associated with alcohol.

8.5 Thalassaemia

Thalassaemia is a hereditary blood haemoglobin disorder that results in varying degrees of anaemia. Although the disease was identified in the early 1950s, it is only in recent decades that its etiology, diagnosis, clinical syndromes and outcomes have been clarified. Thalassaemia is classified both by clinical manifestation and genetic background. The most common types of thalassaemia syndrome are alpha (α) and beta (β) thalassaemia, classified by which part of the haemoglobin molecule is lacking from red blood cells. Both forms of thalassaemia are prevalent in the Asia Pacific Region. The most severe form of α-thalassaemia, Hb Bart’s Hydrops Fetalis, mainly affects those of South-East Asian, Chinese and Filipino ancestry and results in death during the fetal or newborn period. Many individuals with α-thalassaemia have milder forms of the disease with varying degrees of anaemia. β-thalassaemia ranges from a very severe form of anaemia with growth retardation—like the β-thalassaemia major, also called Cooley’s anaemia—to a very mild form with no health effects.

Thalassaemia is a major cause of mortality and morbidity in the Asia Pacific Region. The growing demand on resources for the care of thalassaemia patients makes the disease an important public health issue. Available information on the prevalence of thalassaemia in selected countries and areas of the Region is shown in Table 8.11.

<table>
<thead>
<tr>
<th>Table 8.11 Prevalence of thalassaemia and abnormal haemoglobins in selected countries in the Asia Pacific Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
</tr>
<tr>
<td>Cambodia</td>
</tr>
<tr>
<td>China, Guangxi</td>
</tr>
<tr>
<td>China, Hong Kong</td>
</tr>
<tr>
<td>India</td>
</tr>
<tr>
<td>Indonesia</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
</tr>
<tr>
<td>Malaysia</td>
</tr>
<tr>
<td>Maldives</td>
</tr>
<tr>
<td>Myanmar</td>
</tr>
<tr>
<td>Singapore</td>
</tr>
<tr>
<td>Sri Lanka</td>
</tr>
<tr>
<td>Thailand</td>
</tr>
<tr>
<td>Viet Nam</td>
</tr>
</tbody>
</table>

(+) = abnormal gene present, exact frequency not known.
-- Data not available.

**Prevention**

Prevention is the key strategy of thalassaemia control. This includes carrier screening, genetic counselling and prenatal diagnosis for at-risk couples. Blood examination and family studies can identify individuals with thalassaemia and asymptomatic carriers. Health education programmes, testing for the genetic trait, counselling and prenatal diagnosis help families make informed decisions and bear healthy children. Prenatal testing of fetal cells collected through cordocentesis, chorionic villus sampling or amniocentesis can detect or rule out thalassaemia in the fetus. Introduction of prenatal diagnosis with selective abortion is considered an important factor in the success of thalassaemia prevention programmes. However, medical termination of pregnancy is an ethical and legal issue in many countries.

**Treatment**

Thalassaemia carriers have no symptoms and thus require no treatment. Presently, many children born with major forms of thalassaemia are dying undiagnosed or untreated before age 10 due to anaemia and infection. Children with thalassaemia major require frequent blood transfusions to prevent complications and improve their quality of life, but this carries the risk of acquiring blood-borne diseases such as hepatitis, HIV, malaria and syphilis. Moreover, frequent blood transfusions lead to an accumulation of iron in the body which can damage the heart, liver and other vital organs. For many years desferrioxamine, administered daily by pump, was the only therapy for patients with iron overload. The administration of an iron chelator (chelation therapy) helps eliminate excess iron and prevents or delays problems related to iron overload and toxicity. Children with thalassaemia major who are treated with frequent blood transfusions and properly managed chelation therapy can live more than 30 years. Patients older than age 5 may benefit from a splenectomy. For a minority of patients who have a suitable donor and can afford the costly treatment, thalassaemia can also be treated by bone marrow or stem cell transplantation. There are numerous obstacles to providing appropriate treatment for thalassaemia. A lack of blood supplies means transfusions are unavailable to many patients, and often transfusion safety measures are inadequate. Chelation therapy can average US$ 250–US$ 300 per month and the pump for subcutaneous infusion costs approximately US$ 500.

**National prevention and control programmes**

Thalassaemia poses a significant burden on the health services and economic resources of many countries in the Asia Pacific Region. With advances in knowledge and technology it is now possible to effectively prevent and control the disease. Highly successful programmes have been implemented in Mediterranean countries such as Cyprus, Greece and Italy.

The WHO Regional Committee for South-East Asia in 1995 adopted resolution RC48.R3 on prevention, control and treatment of thalassaemia. The resolution urged Member States to increase community awareness of thalassaemia and requested WHO to facilitate an exchange of information. The Scientific Debate on Prevention and Control of Thalassaemia at the 28th South-East Asia Advisory Committee on Health Research held in 2003 recommended the strengthening of collaborative research on epidemiology, diagnostic and treatment methods, as well as health system research on development, implementation, monitoring and evaluation of models for the prevention and control of thalassaemia.

Increasingly, prevention programmes are being introduced in many parts of Asia such as China, India, Indonesia, Malaysia, Maldives and Singapore. National thalassaemia programmes in Thailand and some other countries are producing positive, measurable results. The prevention and control of thalassaemia serves as a good model for the introduction of comprehensive programmes for the control of other common genetic disorders.
The overall goal of a thalassaemia programme is to ensure the provision of basic facilities, skills and knowledge for prevention and management. Such programmes should be integrated into existing health-care systems. The main components of a national programme include:

- carrier screening in communities known to have patients with thalassaemia;
- integrating counselling by health services and the training of primary health-care staff;
- ensuring community involvement and public education;
- strengthening therapeutic services;
- providing adequate safe blood supplies and affordable chelation agents;
- prenatal diagnosis and selective termination of pregnancy; and
- monitoring and evaluation through maintaining registries of the number of new births, patients and prenatal diagnoses made.

Programmes should be developed that take into account the social and cultural needs of the community. Collaboration among countries in the areas of information sharing, human resources development, technical cooperation, research and technology transfer should be encouraged. The Asian Thalassaemia Network established in 2003 provides a promising forum for international collaboration.

**Box 8.2: Prevention and control of thalassaemia in Thailand**

The National Prevention and Control Programme for Thalassaemia was launched in Thailand in 1994 as a collaboration between the Thalassaemia Foundation of Thailand, university research groups and the Ministry of Public Health. The basis for prevention and control has been the adoption of phenotypic screening followed by counselling and prenatal diagnosis. In response to the need for a screening programme, a test was developed that incorporated primary screening for osmotic fragility followed by a simple dye test. The combination has been effective in detecting a wide range of thalassaemia phenotypes, including \( \alpha \)-thalassaemia-1, \( \beta \)-thalassaemia, haemoglobin E and iron deficiency. A more specific test for \( \alpha \)-thalassaemia-1 has also been available for some time. In terms of prenatal diagnosis, cordocentesis, amniocentesis and chorionic villi sampling are used to obtain fetal tissue for haemoglobin and genetic analysis.

Following a successful pilot programme, a model for the prevention and control of severe thalassaemia was expanded in 1998 to all of Thailand. In 2000, the thalassaemia programme was integrated into the existing health-care system with the Department of Health, universities, regional health centres, and general, district and community hospitals; coordinating a range of services including policy development, education, research, technical support, counselling and screening. In 2001 thalassaemia screening was formally covered by government health-care policy. Available statistics indicated that 518 thalassaemia cases had been prevented since the implementation of the programme. There are now 25 centres offering prenatal diagnosis in Thailand.
References

3 The Earth Institute at Columbia University; Columbia University, Mailman School of Public Health; University of Sydney, Australian Health Policy Institute. A race against time: The challenge of cardiovascular disease in developing countries. New York, Columbia University, 2004.
6 Ibid.
9 Ibid.
10 Ibid.
19 Op cit. Ref 17.
21 Ibid.
23 Op cit. Ref 11.
27 Op cit. Ref 22.
34 Ibid.
37 Op cit. Ref 33
42 Ibid.
43 Ibid.
44 Ibid.
45 Ibid.
48 Op cit. Ref 41.
50 Op cit. Ref 41.
51 Institute of Medicine, Committee on Cancer Control in Low- and Middle-Income Countries; Sloan FA; Gelband H, eds. Cancer control opportunities in low- and middle-income countries. Washington DC, National Academies Press, 2007.
53 Tobacco. Manila, WHO Regional Office for the Western Pacific. Available from: http://www.wpro.who.int/NR/exeres/978BE0FD-AE30-46C6-8F75-1F40AE7B57BC.htm
59 Mackay J, Eriksen M, Shafey O. *The tobacco atlas*. 2nd ed. Atlanta GA, American Cancer Society, 2006
60 Op cit. Ref 29.
65 Op cit. Ref 59.
68 Ibid.
69 Ibid.
72 Ibid.
73 Op cit. Ref 63.
77 Hu TW et al. Data presented at 10th International Conference on Indoor Air Quality and Climate. Beijing, China, 2005.
79 Ibid.
85 Impact of tobacco-related illnesses in Bangladesh. New Delhi, WHO Regional Office for South-East Asia, 2007.
86 Ibid.
89 Op cit. Ref 1.
90 Op cit. Ref 81.
91 Op cit. Ref 59.
93 Ibid.
94 Ibid.
98 Burden and socioeconomic impact study of alcohol: the Bangalore study. New Delhi, WHO Regional Office for South-East Asia, 2006 (Alcohol control series no. 1).
101 Economic impact of alcohol on society. In: Public health problems caused by harmful use of alcohol: gaining less or losing more? New Delhi, WHO Regional Office for South-East Asia. 2006 (Alcohol control series 2).