Today, half the world’s people live in cities, and it has been estimated that the urban population of Asia will double by 2030. Urbanization, development and health are inextricably linked. Jobs, education and new opportunities draw people to cities, where water systems, sanitation, housing and infrastructure struggle to keep up with rising populations; the poor and the marginalized often find themselves victims of an urban equity gap. Globally, one billion people live in urban slums.

Without urgent attention to urban planning, improving access to safe drinking water and sanitation, bringing health services to all and encouraging healthy lifestyles, the gap between the urban rich and poor will widen. This year’s World Health Day focuses on “Urbanization and Health” to draw attention to the need for action by all sectors and people—both public and private, from the individual level to the national level—to address the issues of urban health.

This issue of the Regional Health Forum looks at urbanization in several countries of the South-East Asia Region, as well as issues faced by the Region as a whole. All cities struggle with transportation and water issues; all will be affected by climate change to a greater or lesser degree; and all must address the health issues and needs of the most vulnerable populations, such as youth.

The city is remarkable for its vitality and also for its fragility. Its very growth, if unregulated and uncontrolled, can lead to problems of pollution, degradation of the environment, overwhelming of health systems, erosion of infrastructure, and the decline in health that these factors in turn produce. Cities seem to grow by themselves, due to demographic and economic forces; but it is people who build them and live in them. Their health is the true measure of the city’s health.
Contents

Urbanization and health

Urbanization and water, sanitation and hygiene in Bhutan 1
Tenzin Jamtsho

The urban environment and health: Delhi stands up to the challenge 8
T K Joshi and Salma Burton

Effects of climate change on urban health in the Kathmandu Valley 15
Babu Ram Marasini

Effects of urbanization on health behaviours of young people in Timor-Leste 19
Rui Maria de Araujo

Urbanization dynamics and WHO’s “healthy city” initiatives in the South-East Asia Region 25
Surinder Aggarwal and Abdul Sattar Yoosuf

Comment

Notes and news 35

Publications corner 37

Guidelines for contributors 41
Urbanization and health

Urbanization and water, sanitation and hygiene in Bhutan

Tenzin Jamtsho*

Introduction

Bhutan has followed a conservation-centred development policy that has been crucial in maintaining a good natural resource base. The forest coverage is about 72%; it has mountainous topography with altitude varying from 100 metres to over 7500 metres above sea level. The precipitation varies from 5000 millimetres (mm) in the foothills to 700mm in the high altitude region. Fed by snow and rain, the country is drained by four major river basins and their tributaries. The average flow draining the whole country is estimated at 2325 cubic metres (cu m) per second, which works out to 73 000 million cu m per year with per capita availability of more than 100 000 cu m.1 The Royal Government of Bhutan has made remarkable progress in human as well as economic development since it started planned development in the early 1960s. The government is committed to maintaining harmony between economic development, spiritual and cultural values and environment conservation. The development philosophy adopted by the government is based on “Gross National Happiness”.

Water is crucial for development and for the well-being of people, as well as for achieving the national goal of “Gross National Happiness.”2 Even though Bhutan has a fairly large quantity of fresh water it cannot afford to be complacent. The country faces a number of challenging issues in water resource management due to the expansion of industry and agriculture, and urbanization. The national population growth rate of Bhutan is 1.3%, which means that its population will be double in fifty years. Even though the national growth rate is only 1.3%, the urban population growth in Bhutan has been unprecedented. It is estimated that by 2020, 50% population would reside in urban areas. Moreover, the recent trend in urban growth indicates that by 2020 the urbanization level would be about 73%3. Rapid urbanization and economic growth would mean an increase in water demand to satisfy domestic and agriculture needs. At the same time, however, the water sources are either drying up or are getting depleted. Thus, the additional water required has to be abstracted from the environment. This would mean more water abstraction, more water treatment, more consumption and finally more wastewater discharge into the environment.

Although freshwater is in abundance in Bhutan, the pressure on it is bound to increase with growing urbanization and industrialization. The urban population in 1999 accounted for 21% of the total population and is likely to increase by 50% by the year 2020, which will raise the demand for water in urban centres4. Local and seasonal water shortages are becoming more frequent, and there is evidence of increasing sediment loads in Bhutan’s extensive river system5. The latter is a threat to the rapidly-growing hydropower industry that needs a reliable water supply to sustain the much-needed revenue that currently 

* Department of Urban Development and Engineering Services, Ministry of Works and Human Settlement (MoWHS), Thimphu, Bhutan
underwrites about 45% of Bhutan’s development budget. Despite all the challenges, there has been a significant increase in access to safe drinking water — from 45% of the total population in 1990, to 78% in 2000. While no legislative framework on water supply and related rights is in place, the Bhutan Water Vision, the Water Act and Water Policy are being formulated to create an enabling environment for an integrated and efficient management of water resources.

Country profile
The following are some of the key demographic indicators of Bhutan:
Area (square kilometres - sq. km): 38 394
Population (2005-2006) 683 982
Life expectancy (2005-2006) 66.1 years
Infant immunization coverage (2008) 90%
Literacy rate (2005-2006) 59.5%

Taking the social and economic conditions into consideration, the Human Development Index (HDI) ranking for Bhutan in 2005 was 133 out of 177 countries5.

Institutional set-up for urban water supply and sanitation
Urban development in Bhutan was initiated in 1983 through the Asian Development Bank (ADB) and the Danish International Development Agency (DANIDA) that provided support to urban water supply and sanitation to six major towns. It was the first-ever multicredit facility obtained from ADB to improve urban water supply and sanitation. It was to be executed through international bidding for supply of equipment and civil work. Ever since, there have been continued investments in urban water supply and sanitation areas supported by the governments of Bhutan, Denmark and India and by multilateral institutions like the World Bank and the ADB. The overall achievement of urban water supply and sanitation sectors is largely accredited to the Government of Denmark and other bilateral and multilateral partners6.
The Ministry of Works and Human Settlement (MoWHS) is the pivotal agency to formulate strategies and policies for human settlement in the country. Within this ministry, the Department of Urban Development and Engineering Services (DUDES) is the Central Government agency responsible for executing the urban water supply and sanitation programme. Service-oriented municipal corporations have been established in the two biggest urban centres, namely Thimphu and Phuentsholing.

The Thimphu Municipal Corporation enjoys the highest degree of autonomy with the Municipal Charter granted to it in 2003 as per the Bhutan Municipal Act of 1999. Phuentsholing, the second largest town was granted financial autonomy for water and sanitation in 1996 and is now gearing up to receive the Municipal Charter similar to the one granted to Thimphu Municipal Corporation. In other districts, municipal corporations that provide municipal services to urban residents have been established. These smaller municipal authorities are placed under the district administration for their routine functioning and management of services. Urban water supply and sanitation projects are planned and designed by the central agency but are often implemented by the district administration with technical backstopping from the central department.

The Royal Government of Bhutan has enacted various acts, policies, rules and regulations, and codes to enable effective and efficient urban water and waste management.

**Water supply and sanitation coverage in urban areas**

Bhutan consists of twenty districts and about 69% of the population lives in rural areas. Urban areas consist of 54 towns. Almost all towns are supplied with piped drinking water.

The recently-published World Health Organization (WHO)/United Nations Children’s Fund (UNICEF) Joint Monitoring Programme (JMP) report indicates that in 2006 urban water supply coverage in Bhutan was 99%. Water supply facilities have reached almost all households in urban Bhutan. However, water supply is still irregular in most towns mainly due to the rapid growth of urban population. The expansion of water supply and sanitation systems is not commensurate with the rapid population growth. Therefore the limited water supply has to be stretched for a larger population, which leads to rationing of the supply. Another problem associated with insufficient water supply is the high water loss in the system due to breakage of old pipes and sometimes illegal tapping by some residents (Table 1).

**Table 1: Water loss in Thimphu city water supply system (2006-2010)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-2007</td>
<td>28%</td>
</tr>
<tr>
<td>2007-2008</td>
<td>27%</td>
</tr>
<tr>
<td>2008-2009</td>
<td>25%</td>
</tr>
<tr>
<td>2009-2010</td>
<td>23%</td>
</tr>
</tbody>
</table>

The major water quality problem is with microbiological contamination. Most urban water supply systems in Bhutan have a basic water treatment facility. However, due to lack of monitoring of water quality, inadequate treatment facilities, and poor maintenance of the system, water that flows from taps is not always safe to drink. The majority of residents in urban areas either boil or filter the tapwater before drinking.

The urban sanitation coverage stands at 88%. Only five towns have sewerage treatment plants. However, only about 30% households in these towns are connected to sewerage treatment plants. The rest are all connected to septic tanks or traditional pits. The toilets in towns without sewerage treatment...
plants are connected to septic tanks. There is every possibility of sewage from the septic tanks and pits seeping into the groundwater and rivers, thereby polluting the fresh water sources.

With rapid economic and population growth in urban areas, and changing lifestyles, Bhutan is facing increasing challenges in managing solid waste. Concerns of unsatisfactory disposal of solid waste in some of the bigger urban towns have been noted in the recent years. A person in urban Bhutan produces about 0.25 kg solid waste per day.

A study conducted in 10 towns in 2007 revealed that organic waste formed the largest proportion of municipal solid waste with 58.05%.

Not all towns in Bhutan have a solid waste management system. Some of the bigger towns have municipal waste collection services. But in places where such services are not available, waste is disposed of in small garbage pits and burnt. While some waste is burnt in open spaces, a good section of people dispose the waste in the streets, drains, rivers and streams, and bushes. Some towns use landfill sites to dispose of municipal waste but none qualify as a sanitary landfill as the standard norms are not followed. All such actions lead to pollution of the environment, especially the air, water bodies and open spaces.

Developing human resources in municipalities and setting up proper waste management systems would go a long way in preserving the pristine environment that ultimately improves the quality of life. The high organic content of urban solid waste gives opportunity to explore composting as an option for managing waste in a more eco-friendly manner. Municipal authorities are also looking at the means of segregating waste at the point of generation and implementing recycling or reusing wherever it is relevant.

Impact of water and sanitation on health

Water, sanitation and hygiene are the foundations of good health. It is estimated that 88% of diarrhoeal deaths worldwide are attributable to unsafe water, inadequate sanitation and poor hygiene. Some of the waterborne and water-related diseases prevalent in urban Bhutan are diarrhoea, typhoid, skin infections, conjunctivitis, dengue and malaria. With improvement in the health care system combined with increasing access to water and sanitary facilities, diarrhoeal mortality especially in under-five children has reduced drastically in the past decade. However, decrease in diarrhoeal morbidity has not been significant. The reasons for this could be water safety issues and unhygienic practices. For instance, typhoid cases are reported every year from various towns during monsoons — a typhoid outbreak was reported in Damphu town in 2002. The Department of Public Health that investigated the outbreak gave clear evidence of the main cause being water contamination at the source and during distribution of water in the system due to broken pipes and lack of treatment facility.

Dengue was reported for the first time in Bhutan in July 2004; 2579 suspected dengue cases were reported in the outbreak in 2004. Since then, several cases have been reported every year especially from Phunstholing town. The dengue-causing mosquito breeds in clean and stagnant water easily found in homes such as flower pots, water tanks, old tyres, rainwater gutters, or water collected in any small containers. Therefore, proper storage and management of water at home and in surrounding areas is very important in preventing dengue. Table 2 presents the incidence of the top ten diseases in Bhutan in 2008.
Table 2: Top ten diseases in Bhutan, 2008

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of the disease</th>
<th>Numbers in 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Common cold</td>
<td>266,164</td>
</tr>
<tr>
<td>2</td>
<td>Skin infections</td>
<td>97,514</td>
</tr>
<tr>
<td>3</td>
<td>Peptic ulcer syndrome</td>
<td>63,039</td>
</tr>
<tr>
<td>4</td>
<td>Musculo-skeletal</td>
<td>61,001</td>
</tr>
<tr>
<td>5</td>
<td>Acute pharyngitis/tonsillitis</td>
<td>60,510</td>
</tr>
<tr>
<td>6</td>
<td>Other disorders of the skin and subcutaneous tissues</td>
<td>59,335</td>
</tr>
<tr>
<td>7</td>
<td>Diarrhoea</td>
<td>58,537</td>
</tr>
<tr>
<td>8</td>
<td>Other diseases of the digestive system</td>
<td>54,859</td>
</tr>
<tr>
<td>9</td>
<td>Other respiratory and nose diseases</td>
<td>51,145</td>
</tr>
<tr>
<td>10</td>
<td>Conjunctivitis</td>
<td>37,240</td>
</tr>
</tbody>
</table>

Table 3 indicates the number of waterborne disease cases in the past five years.

Table 3: Waterborne diseases in the past five years (2004-2008)

<table>
<thead>
<tr>
<th>Name of disease/infection</th>
<th>Year and number of cases reported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2004</td>
</tr>
<tr>
<td>Cholera</td>
<td>27</td>
</tr>
<tr>
<td>Typhoid</td>
<td>2,148</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>69,539</td>
</tr>
<tr>
<td>Dysentery</td>
<td>31,110</td>
</tr>
</tbody>
</table>

Challenges

The following are the challenges:

(1) Water quality data assessment and management is lacking for urban centres. It is very important to have a water quality information management system for all urban centres as it would help in proper water resource planning and allocation in urban areas.

(2) Human resources: Human resources and capacity building have always been big challenges in the context of urbanization. With increasing population, the pressure on the existing urban infrastructure is also increasing. The municipal offices are usually not manned with adequate and qualified staff. The municipal in-charge/engineers or lower-level staff who shoulder responsibilities have in fact little or no formal training.

(3) Funding: In most developed countries important projects are not restricted to the funds available whereas in Bhutan, the scarcity of financial resources acts as a limitation to infrastructure development. With urbanization, the government will have to prioritize water and sanitation activities.

(4) Proper solid waste management strategies: Landfill is currently the most preferred alternative for waste disposal by local municipal authorities as it is still the cheapest and easiest method of getting rid of wastes away from towns (“out of sight, out of mind”), in the absence of strict environmental regulations on landfill disposal. Recycling infrastructures are an essential component of integrated solid waste management for resource recovery and for reducing wastes going to landfills.

(5) Operation and maintenance of urban infrastructure: Even though the coverage of water and sanitation infrastructure in Bhutan is good, its functionality still remains poor. Urban centres should implement approaches and tools that help to improve water quality and quantity, and eventually the sustainability of water supply and sanitation systems.

(6) Availability of better alternatives: In order to provide an urban infrastructure, it is important to have many alternatives in terms of cost-effectiveness, sustainability and efficiency.
Conclusion

While health is an important component for the growth and development of any country, the lack of safe drinking water and poor sanitation in Bhutan contribute to widespread and recurring health problems. In order to tackle this problem, the government allocated 8% of its 2008-2009 budget to improve the health services, both in terms of their quality and accessibility, as improving health is seen to be central to the achievement of the national vision of “Gross National Happiness”.8

As a result of the high priority accorded by the Royal Government of Bhutan to providing access to safe drinking water and basic sanitation, the country has made sustainable progress in providing these services in both rural and urban areas.

Safe, adequate and accessible supplies of water with proper sanitation are the foundation and an essential component of primary health care. Insufficient provision of safe drinking water and sanitation results directly and indirectly in communicable diseases, health risks, poor health and environmental pollution. Bhutan has always considered water and sanitation as one of the basic primary health care components that contributes directly to “Gross National Happiness” and is also a very important indicator of progress made towards achieving the Millennium Development Goals (MDGs). Therefore, the goal of achieving universal access to adequate safe drinking water in the Tenth Five Year Plan has been accorded the status of one of the top three priorities of the new government. Ever since the water supply and sanitation programme started in 1974, sanitation has always been part of the water supply component. Therefore developments in the area of sanitation have to be viewed in the overall context of developments in the area of water supply.

References and bibliography


The urban environment and health: Delhi stands up to the challenge

T K Joshi*, Salma Burton**

Global scenario

The World Health Organization (WHO) has chosen the theme of “Urbanization and Health” for World Health Day for the current year 2010. According to WHO, as of now, over three billion people live in cities. A recent report by the United Nations Population Division observed that half of the world’s population now lives in urban areas, and it has been projected that within the next 30 years, nearly two thirds people will live in cities.1 The urban areas of the less wealthy region of the world are likely to experience much of the growth in population (growth from 1.9 billion in 2000 to 3.9 billion in 2030), with the most rapid increase in numbers likely to occur in Asia and Africa. As an example, the number of urban dwellers in the least urbanized region, Asia (1.4 billion), is already greater than the urban population in North America and Europe combined (1.2 billion) in 2000.2

The growing mega cities attract migrants from impoverished areas and the resulting influx of poor migrants ends up in slums where the environmental conditions and the facilities are inadequate to maintain human health. A “slum” is defined by The United Nations Human Settlements Programme (UN-HABITAT) as one that includes “a wide range of low-income settlements and/or poor human living conditions.”3 If governments neglect the environmental and urban causes of the growing health burden on the urban poor, the nations and the global society will simply accumulate massive “health debt”, which will be far more expensive to pay off.4

Indian scenario

Between 1951 and 1991, the Indian urban population rose from 62.4 million in 1951 to 217.6 million in 1991. About two thirds of the urban population are concentrated in 317 Class I cities (population of over 100,000), half of which lives in 23 metropolitan areas with populations exceeding 1 million.

The rapid growth of population in India and the corresponding need for transportation and energy resulted in an unplanned urban growth adding to the problem of air pollution caused predominantly by vehicles, with significant contribution by industry and thermal power plants in some pockets. The impact of vehicular emissions on the general population is heightened by the emissions occurring at the ground level. According to the Central Pollution Control Board (CPCB), “vehicles contribute significantly to the total air pollution load in many urban areas”. The number of motor vehicles increased from 0.3 million in 1951 to 37.2 million in 1997, with 32% concentrated in 23 metropolitan cities. Delhi with about 8% of the total registered vehicles, had more registered vehicles than those in the other three metros (Calcutta, Chennai and Mumbai).5 The aforementioned trends forced policy-makers to clean up the air and take action to improve the public transportation system.
Investigators studied the relationship between levels of particulate matter and daily deaths in Delhi between 1991 and 1994. The average total suspended particulate (TSP) level in Delhi was 375 micrograms per cubic metre (μg/m³) approximately, five times the annual average standard of WHO. The levels during the time period mentioned above exceeded WHO’s twenty-four-hour standard on 97% days on which readings were taken. The authors noted that “if one cares about life-years lost, the impacts of a 100-microgram increase in TSP in Delhi are more startling”.

**Case study of Delhi with regard to its response to the urban transport challenge**

Delhi was named as National Capital Territory (NCT) of Delhi on 1 February 1992 following the Sixty-ninth Amendment to the Constitution. According to the 2001 census, India’s population stood at 1028.7 million. The economic survey conducted in 2005-2006 noted a rise in Delhi’s population from 9.4 million in 1991 to 13.8 million in 2001. Table 1 gives the details of Delhi’s population.

**Table 1: Population of Delhi - Economic Survey, 2005-2006**

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Total population</th>
<th>13 850 507</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Males</td>
<td>7 607 234</td>
</tr>
<tr>
<td>2.</td>
<td>Females</td>
<td>6 243 273</td>
</tr>
<tr>
<td>3.</td>
<td>Total rural population</td>
<td>944 727</td>
</tr>
<tr>
<td>4.</td>
<td>Rural males</td>
<td>522 087</td>
</tr>
<tr>
<td>5.</td>
<td>Rural females</td>
<td>422 640</td>
</tr>
<tr>
<td>6.</td>
<td>Urban population</td>
<td>12 905 780</td>
</tr>
<tr>
<td>7.</td>
<td>Urban males</td>
<td>7 085 147</td>
</tr>
<tr>
<td>8.</td>
<td>Urban females</td>
<td>5 820 633</td>
</tr>
</tbody>
</table>

Delhi also has the distinction of being the most urbanized union territory with a population density of 9340/sq km against the density of 43/sq km in the Andaman and Nicobar Islands, another Union Territory. According to the Ministry of Health and Family Welfare, Government of India, there has been a steady growth in urban population due to people migrating from rural areas since 1961. It is clear that urban population has increased steadily with more than 500 million now living in urban India.

The NCT of Delhi not only has the highest density of population in India but also has the largest number of people living in an urban environment, as approximately 93.7% of the population live in the city. Such urban concentration with shortage of space creates overcrowding and forces many of the immigrants to live in cramped conditions in the slums. According to the Registrar General of Census, India, it was estimated that nearly 2 025 890 people live in slums, of which the males number 1 138 063, and females comprise 887 827. However, the white paper prepared on Delhi estimated that nearly 30% of Delhi’s population lived in slum areas.

The present urban scenario of Delhi has resulted from an allround increase in industrial units and vehicular traffic. There were nearly 8000 industrial units in Delhi in 1951 but by 1991 this figure went up to 125 000. The number of vehicles in the city increased rapidly from 235 000 in 1975 to 2 629 000 in 1996, and is expected to reach six million in 2011. Of the total air pollution load in the region, vehicular pollution is responsible for 67% — approximately 3000 metric tonnes (mt) per day. The next contributor is industry that causes 25% air pollution. The main culprits identified are the coal-based thermal power plants. The three power plants in the NCT of Delhi together generate 6 000 mt of flyash per day. There are 16 big drains traversing the landscape of Delhi, which discharge 1900 million litres per day of municipal sewage and wastewater into the river Yamuna. The industrial effluent contributes 320 million litres per day.
amount of solid waste generated in the city is about 5000 mt per day. In certain localities, the noise levels are attaining alarming levels. An action plan was prepared towards the end of last millennium by the Union Ministry of Environment and Forests, Government of India, after undertaking monitoring for various pollutants.\(^8\)

Monitoring: The Central Pollution Control Board, the regulatory and the chief monitoring agency regularly measures air quality at various locations in Delhi. The measurements are made for sulfur dioxide, oxides of nitrogen and particulates. The ambient air quality data have revealed elevated values for suspended particulate matter (SPM) at all monitoring stations, namely 367-452 $\mu$g/m\(^3\) on an annual average basis as against the prescribed standard of 140-360 $\mu$g/m\(^3\). Though the annual mean value of sulfur dioxide (15-26 $\mu$g/m\(^3\)) and oxides of nitrogen (28-46 $\mu$g/m\(^3\)) remain within the prescribed limit of 60-80 $\mu$g/m\(^3\), there is a rising trend. As compared with 1989, the sulfur dioxide atmospheric concentrations in 1996 registered a 109% elevation, and oxides of nitrogen an 82% elevation. The suspended particulate matter atmospheric concentration has shown only a nominal rise because of the installation of electrostatic precipitators by thermal power plants in Delhi.

According to a study of air pollution in Asian countries, the respirable particulate matter (RSPM) or PM\(_{10}\) is the main pollutant. However, in cities where the number of vehicles is increasing, there is greater concern over levels of nitrogen dioxide (NO\(_2\)) and ozone (O\(_3\)). Delhi recorded the highest levels of SPM and PM\(_{10}\) much higher than the levels found in Bangkok, Beijng or Manila. Even other Indian cities like Chennai, Kolkata and Mumbai had lower values of PM\(_{10}\).\(^6\)

**Initiatives to improve urban air quality in Delhi**

An important development took place in 1998 in Delhi. In order to address the issues of environment and health, an authority, notified as the “Environment Pollution (Prevention and Control) Authority for the National Capital Region,” was constituted. It comprised eminent environmentalists and executives.\(^10\)

The Authority was conferred with the necessary powers to protect and improve the quality of the environment, and to prevent, control and lessen environmental pollution. It was empowered to issue directions in respect of complaints relating to the violation of an order passed by any authority pertaining to:

- standards for maintaining the quality of the environment in its various aspects;
- standards for omission or discharge of environmental pollutants from various sources;
- restriction of areas in which any industries, operations or processes or class of industries or processes shall not be carried out or shall be carried out subject to certain safeguards;
- procedures and safeguards for the prevention of accidents that may cause environmental pollution and remedial measures for such accidents; and
- procedures and safeguards for the handling of hazardous substances.

**The compressed natural gas experiment**

On 5 April 2002, a three-judge Bench of the Supreme Court directed the Delhi government to comply with its orders on the conversion of diesel-run buses in the capital to the compressed natural gas (CNG) mode. The apex court on three earlier occasions had called upon the government to replace diesel with an alternative fuel through its orders passed on 21 October 1994, 28 March 1995 and 9 February 1996. The Bench ruled that its orders could not be nullified or altered by administrative decisions of the central and state governments. The court also directed the
Government of NCT Delhi to phase out diesel buses at the rate of 800 a month, starting 1 May 2002. The Central Government was also directed to give priority to the transport sector, including private vehicles, in Delhi and other highly air-polluted cities, and eventually in the entire country, for allocation of CNG.

The Central Pollution Control Board (CPCB) is the regulatory and technical arm of the Union Ministry of Environment and Forests, Government of India, which through the State Pollution Control Boards (SPCBs), and State Pollution Control Committees keeps a watch on the state of pollution throughout the country. The Board conducted a comparative study to assess the environmental impact of CNG introduction, the results of which are presented in Table 2. Except for carbon monoxide and sulfur dioxide which showed a decline, other parameters such as SPM and PM$_{10}$ have registered an increase. Table 3 shows how immediately after the introduction of CNG in 2001, the parameters declined but started rising again.

Table 2: Ambient air quality of Delhi - Comparison of pre-CNG introduction (2000) levels with those in 2008*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Prescribed annual standard (residential)</th>
<th>2000</th>
<th>2008*</th>
<th>Percentage increase/decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Vehicles</td>
<td>35</td>
<td>55</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Sulphur dioxide</td>
<td>60</td>
<td>18</td>
<td>5 (-72)</td>
<td></td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>60</td>
<td>36</td>
<td>48</td>
<td>33</td>
</tr>
<tr>
<td>SPM</td>
<td>140</td>
<td>405</td>
<td>413</td>
<td>2</td>
</tr>
<tr>
<td>RSPM</td>
<td>60</td>
<td>159</td>
<td>192</td>
<td>21</td>
</tr>
<tr>
<td>Carbon monoxide*</td>
<td>2000</td>
<td>4686</td>
<td>2348</td>
<td>(-50)</td>
</tr>
</tbody>
</table>

Source: Central Pollution Control Board (CPCB), Delhi
All values are in $\mu g/m^3$

* Data of November and December have been taken from the year 2007 for averaging the values for 2008

Observations:
Increase in number of vehicles (57%); nitrogen dioxide (33%); SPM (2%) and RSPM (21%)
Decrease in sulphur dioxide (72%) and carbon monoxide (50%)

Table 3: Levels of pollutants in Delhi (2000-2003)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur dioxide</td>
<td>18</td>
<td>14</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>36</td>
<td>34</td>
<td>39</td>
<td>45</td>
</tr>
<tr>
<td>SPM</td>
<td>405</td>
<td>348</td>
<td>424</td>
<td>352</td>
</tr>
<tr>
<td>RSPM</td>
<td>159</td>
<td>137</td>
<td>166</td>
<td>148</td>
</tr>
<tr>
<td>Carbon monoxide*</td>
<td>4686</td>
<td>4183</td>
<td>3258</td>
<td>3831</td>
</tr>
</tbody>
</table>

Source: CPCB
All values are in $\mu g/m^3$

Figure 1 shows the rise in the number of vehicles from 3,500,000 in 2000 to 5,500,000 in 2008; this led to a rise in levels of some of the pollutants in urban air.

Figure 2 shows the growth of CNG-driven vehicles in NCT of Delhi. The number of CNG-based vehicles in all categories has been rising over the years, starting from 2001.

An elaborate study undertaken in Delhi found that the concentration of carbon monoxide, sulphur dioxide and PAHs recorded a significant decrease after the introduction of CNG as an alternative to diesel or petrol-fuelled vehicles, but an increase in NOx
concentration was noticed. However, concentrations of BTX (benzene, toluene, and xylene), SPM, and PM$_{10}$ showed no significant changes. Nonetheless, a fall in BTX concentration was noticed due to reduction in the benzene content in petrol. Furthermore, the SPM and PM$_{10}$ concentrations in Delhi seem to be related not only with vehicular emissions, but also with other anthropogenic and natural emission sources.\textsuperscript{12}

**Major initiatives taken to reduce air pollution in Delhi**

- Unleaded petrol introduced in the National Capital Region in September 1998.
- Sulfur content in diesel reduced from 0.5% (April 1996) to 0.05% (April 2000).
- Catalytic converters introduced in passenger cars in April 1995.
- Gasoline in benzene reduced from 5% (April 1996) to 1% (November 2000).
- Restrictions imposed on operation of goods vehicles during daytime from August 1999.
- Diversion of interstate buses.
- Time clocks installed at red lights.
- Construction of fly over and sub ways for smooth flow of traffic.
- Metro rail for mass rapid transport introduced.
- Introduction of pre mixed 2T oil for two stroke engine from April, 1999.
- Introduction of CNG for commercial transport vehicles (buses, taxis, auto rickshaws etc.)
- Ethanol blended (5% petrol) introduced.
- ‘Pollution Under Control’ certificate with three month validity introduced
- Fuel quality standard (Bharat Stage – I, II, III and IV) introduced.

**Overhaul of Delhi’s urban transport system, and the Delhi Metro Rail Corporation (DMRC) Project**

The Department of Transport under the Government of National Capital Territory of Delhi in 2002 prepared a plan to tackle the problems of urban transport brought about by
rising concentrations of pollutants, shrinking road space, and rising number of fatal road accidents, all of which created a public health crisis. The projection that by 2021 the population of Delhi will zoom to 27.9 million from the existing 13.8 million, added to the urgency.13

It was proposed that a mass transport system including a metro, commuter rail and buses be developed. Considering this, the 245 km of a metro system network to meet the demand of a rapidly-urbanizing city, 2021 was chosen as the target year. Though Phase I of this network got completed in 2005, major construction work on different routes connecting Delhi to neighbouring towns is still on to create, at the end of the day, an Integrated Rail and Bus Transit (IRBT) system. The downside of the ambitious metro rail project has been a spate of accidents at various construction sites. According to the Government of India, the two major projects under way in Delhi at present are those of DMRC, and construction of the forthcoming Commonwealth Games (CWG) sites. Construction workers employed at the DMRC and CWG sites total 120,364 and 11,089 respectively.14

Conclusion
The introduction of CNG was the result of a judicial directive to address air pollution in Delhi. The early results of the switch to CNG were encouraging and people could feel the improvement in air quality. However, the levels of RSPM went up and stood at 150 \(\mu g/m^3\) (averaged) in 2008 – a 40% increase over the previous decade. A major contributor to this rise has been the new vehicles on the road. In 2005-2006, the number of vehicles that were registered daily was about 1000, up from 580 daily in 2000-2001. The total number of vehicles increased from 3.6 million in 2001 to 4.8 million in 2006. The growing traffic also led to an increase in the suspension of road dust in the atmosphere; this has become a critical source.15 Another case study shows that Delhi’s population is likely to double by 2020. The number of vehicles is also likely to go up by 3.7 times over the same period. The case study also projects that travel demand in Delhi would increase from 73 billion passenger kilometres in 1997 to 253 billion passenger kilometres in 2020.16

The NCT of Delhi is an example where judicial activism, combined with political will and inputs provided by nongovernmental organizations and international agencies saved the city from near disaster on account of its explosive urban growth, compounded by inadequate and poorly implemented regulations. The use of CNG to reduce air pollution appears to have been a transient success, as the increase in number of vehicles are neutralizing the gains achieved through CNG. Therefore, a new and innovative strategy focused on promoting mass transportation with less dependence on fossil fuels can offer a better solution. However, the issue of air quality will continue to present a challenge to city planners.

References


Effects of climate change on urban health in the Kathmandu Valley

Babu Ram Marasini*

Background
The effects of climate change on inland high altitude cities such as Kathmandu, Nepal are multifarious. Specifically, a health-related impact has been shown in changing patterns in disease outbreaks.

Kathmandu is a mountainous valley with 899 square kilometres in total surface area, at an altitude of 1372 metres from mean sea level. The total population of the Kathmandu Valley was estimated to be 2 million in 2009. There are three districts and five municipalities and some suburban areas within the Kathmandu Valley. Kathmandu, being the capital city of Nepal, has very high population pressure due to its better security, health, education and ongoing economic activities, especially in the construction sector. The Kathmandu Valley’s bowl-shaped topography, which restricts air movement and traps air pollutants, make it vulnerable to extreme climate conditions and air pollution. However, the valley is not directly connected with the Himalayas through glacial rivers, so it is not vulnerable to glacial lake outburst floods (GLOF), which is one of the most important expected factors for severe flooding in rivers and low-lying areas.

Nepal is divided into three ecological belts: the Himalayan belt in the north on the Chinese border, the plain or terai belt in the south adjoining northern India, and the hilly belt lying in between the high and low ecological regions. The Kathmandu Valley falls in the hilly region. Rainfall in Nepal is very much linked to the South Asian monsoon patterns.

Objective, methodology and process
The objective of this paper is to review the effects of climate change on environmental and urban health of population living in the Kathmandu Valley.

A review of secondary literature focusing on studies and articles related to climate change and environmental and urban health in the Kathmandu Valley has been undertaken. Policy-level recommendations have been provided based on the reviewed studies and articles.

Evidence establishing linkages between climate change and urban health is not substantial. Therefore, this paper is restricted in terms of its conclusions, and neither is it exhaustive.

The findings have been presented in terms of the following parameters: water supply and sanitation, air pollution, and the effects of climate change on urban health.

Water supply and sanitation
The daily requirement of water in the Kathmandu Valley is 280 million litres of drinking water per day; however, Kathmandu Upatyaka Khanepeani Limited (Kathmandu Valley Water Supply Limited) is supplying only

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160 million litres per day. Drying up of traditional sources of drinking water and decreases in water flow in rivers flowing in the valley due to erratic rainfall patterns has led to shrinking of drinking water production and an increase in river pollution. To compensate for the decreased water production, water supply agencies are using underground water for drinking purposes, and this is also causing a decrease in the underground water level every year. Use of underground water is drying up traditional water spouts, which is one of the sources of drinking water for the poor and underprivileged because piped drinking water availability is very low in many areas of the Kathmandu Valley. This is affecting the health of the poor as they are compelled to consume unsafe water.

There is a complex relationship between unplanned growth in urban populations and environmental health. As urban population grows, the demand for essential services such as water, sanitation and sewerage fails to meet the supply. Contaminated surface and groundwater sources, poor faeces disposal and inadequate sanitation and sewerage negatively affect human health.

Lack of adequate water supply is making sanitary conditions unsatisfactory in many parts of the valley. Rapid urban growth has also increased the daily production of solid waste and consequently, proper and timely disposal is becoming a major problem. Improper solid waste disposal causes the germination of harmful vectors, viruses and bacteria, especially during summers. Climate change is resulting in extreme weather events, which further contribute to changing patterns of morbidity and mortality associated with vector-borne and water-borne diseases.

There exits a climate change and water nexus. Climate change results in extreme weather events, which in turn has an impact on the way water is used. Water variability is seen to be more of a threat on growth than water scarcity. This variability is expected to increase with climate change. The Kathmandu Valley is highly vulnerable given the high population density, poverty and dependence on rainfall. As a result, the effects of climate change on water resources could either lead to cooperation or conflict as competition for resources and stress from extreme weather events increase. The possibility of conflict is greater, and this would have a detrimental impact on growth, security and sustainability. The problem of sanitation, associated with water variability and water scarcity, would also worsen.

**Air pollution**

Air pollution is emerging as a major problem in Nepal’s urban centres, particularly in the Kathmandu Valley and large cities. This problem is further compounded by rapid and haphazard growth, leading to dense settlements, the mushrooming of polluting industries, a poor road network, and a largely unmanaged transportation system. Air pollution in the valley, particularly the concentration of particulate matter (PM), is already several times higher than national and international standards. Data for 2005 indicate an average PM10 level of 135 microgrammes per cubic metre for residential urban areas in the valley. This air quality continues to deteriorate, mainly due to rising numbers of vehicles and industries, and contributes to the presence of a thick haze.

**Climate change and urban health in the Kathmandu Valley**

Extreme weather events are being witnessed in the Kathmandu Valley as a result of climate change. Global warming is resulting in an increased length of summers with warmer days, more days with higher intensity of rainfall per day, and fewer days of rainfall.

As mentioned earlier, climate change and rapid urbanization is resulting in the emergence of new vectors and viruses. A study has shown the existence of at least 12 types of
mosquitoes of *culex* and *anopheles* species in the Gokarna area, a suburban area of Kathmandu.\(^5\) *Aedes aegypti* a vector responsible for dengue fever, was also found in Kathmandu in June 2009.\(^6\) Japanese encephalitis (JE) cases have been reported from hilly districts of Nepal since 2004. The cause of acute encephalitis in hill and mountain districts is noted to be consistent with the report of JE endemicity in the Kathmandu Valley.\(^7\) Circulating filarial antigen (CFA) of *Wuchereria bancrofti* was particularly high in the village development committees (VDCs) tested in that area (e.g. 20% in Kathmandu and Bhaktapur, 26% in Kavre)\(^8\). Leptospirosis has been found in half of the 36 patients in a study carried out by Patan Hospital, Lalitpur in patients with acute febrile illnesses\(^9\) and seroprevalence of 32.5% was found in residents of Kathmandu Valley in another study on leptospira infection carried out by Tribhuvan University Teaching Hospital, Kathmandu.\(^10\)

Lalitpur district is located in the west and south of the Kathmandu Valley, and 13 cases of malaria were detected in this district in 2006; out of these, two were confirmed cases of indigenous malaria.\(^11\)

Bacterial diseases such as cholera, typhoid fever and food poisoning are also gradually increasing in the valley because of poor quality of drinking water, deteriorating sanitary conditions and problems linked to the solid waste disposal system; increases in temperature due to climate change can lead to the widening of the geographic range of vectors.

**Discussions and conclusions**

Climate change is having an impact on urban health in the Kathmandu Valley. The effect of climate change on health can be minimized by improving the quality of drinking water, sanitation, solid waste disposal and managing urban population growth. There is an urgent requirement to complete a major water supply project to meet the requirement for safe drinking water in the Kathmandu Valley; the Melamchi Water supply project is being implemented. Upgrading of roads is required as flooding of roads and low-lying areas is a regular phenomenon due to intense rain, and this requires upgrading of the sewerage system.

Since there is little evidence to establish the cause-effect relationship between climate change and effects on urban health, more applied research needs to be undertaken. It is imperative to have a stronger disease surveillance system in place. Vulnerability assessment needs to be conducted to identify hot spots of disease outbreaks linked to changing climate. Advocacy among all stakeholders has to be promoted, and a stronger focus put on multisectoral convergence. Community resilience needs to be built up through capacity building and empowerment. This will hopefully result in mitigation and adaptive mechanisms being put in place by the community, therefore increasing sustainability.

**References and bibliography**


Effects of urbanization on health behaviours of young people in Timor-Leste

Rui Maria de Araujo*

Introduction

Urbanization is defined by the United Nations as the movement of people from rural to urban areas, whose population is projected to amount to half of the world’s population in 2008, rising to about 60% in 20301. As an increasingly higher number of people leave farms and villages to live in cities particularly in the developing countries, urban centres will grow at a rate previously unseen in mankind’s history. According to the UN State of the World Population 2007 report, 93% of urban growth will occur in developing nations, with 80% of it occurring in Asia and Africa2.

Rates of urbanization vary between countries, and urbanization is normally determined by individual initiatives in search for better economic opportunities. For example, in developed countries, people find it difficult to improve their standard of living beyond basic sustenance in the rural areas, because farm life is dependent on unpredictable environmental conditions, and in times of drought, flood or pestilence, survival becomes extremely problematic. Cities, in contrast, are places where money, services and wealth are centralized on one hand, and on the other, better basic services such as education, health care, water and sanitation, as well as better opportunities and variation of jobs are provided3. In developing countries, however, despite similarities in the motivation for rural dwellers to migrate to urban centres, unlike their peers in the developed world, they normally find themselves living in suburbs, without much access to better basic services, and often times ending up as unemployed and the most marginalized ones of their society. In addition to that, available data indicate a range of urban health hazards and associated health risks such as substandard housing; crowding; air pollution; insufficient or contaminated drinking water; inadequate sanitation and solid waste disposal services; vector-borne diseases; industrial waste; increased motor vehicle traffic injuries; stress associated with poverty; and unemployment4.

In Timor-Leste, recorded information about the dynamics of urbanization dates back to the mid-1800s when, the capital city of Dili, founded on 10 October 1769, by 1860 had up to 2% of the total population of Timor-Leste5. The percentage of urban Dili’s population during the Portuguese colonial period, however, remained almost unchanged throughout the early and mid-Tenth century, (1.8% of the total population by 1927 and 1.5% by 1970), but increased to about 18% by 1996, during the Indonesian military occupation, and by 2004, when the first population census of an Independent Timor-Leste was conducted, it was 19%5, 6, 7.

The initial agglomeration of population in the capital city of Dili since the mid-19th century was mainly driven by colonial policy,
and there were no indications of rural indigenous people migrating to seek better economic advancement. The rapid increase in population movement from outlying districts to the capital city of Dili, during the late 1900s and the first decade of this century, however, appear to have been caused by political, social and economic instability experienced by the rural population in Timor-Leste, firstly due to 24 years of military occupation, and secondly because of post-independence development initiatives. This increasing trend of urbanization in Timor-Leste, apart from carrying obvious political, social, economic and environmental effects for the country in general, is also producing effects on the health of population and individuals, particularly in the aspects of risk-taking and health-seeking behaviours. This paper seeks to explore and discuss some of these effects of urbanization by examining practices related to alcohol and tobacco use, and to unsafe sex among young people in Timor-Leste.

### Urbanization in Timor-Leste

Timor-Leste is a post-conflict country that gained its independence in 2002, after Portuguese colonial rule between the 1500s and 1975, and the liberation struggle waged by its people against Indonesian military occupation between 1975 and 1999. More than 40% of its estimated population of 1,149,000 (2010) live below the national poverty line of less than US$ 0.88 per day, with 85% of them living in rural, and mainly subsistence agricultural areas.

In this sense, the definition of an urban place applicable to Timor-Leste involves spatial concentration of people whose lives are organized around non-agricultural activities. By this classification, the population of Dili is by far the most urban in Timor-Leste at almost 90%. The population census of 2004 identified that the five most densely populated subdistricts of the country were located in the capital, representing 21% of the country’s population, but occupying only 1.5% of its land area. By contrast, the 25 most sparsely populated sub-districts are home to 21% of the population but these cover almost 50% of the country’s land area. Some additional characteristics of urban Dili’s population described by the census 2004 are summarized in the following paragraph.

Firstly, in 2004, only 54% of the total population of Dili was born in Dili, and 46% were migrants from outlying districts. Secondly, there is a concentration of males in and around Dili, reflecting a movement of males and particularly young men, to the capital in search of work. Thirdly, Timor-Leste’s average household size is 4.7, but Dili’s average household size is 5.2 in four of its five subdistricts, partially explaining the large number of people who have migrated from rural areas, and lastly, urbanization in Dili reflects a population that is less than 65 years old. Dili has the highest proportion of population older than 18 years who graduated from high school, with the proportion of males being higher than that of females by 7.3%. Moreover, taking the age group between 15 and 34 years as the defining age range for young people in Timor-Leste, the data from the same census show that 30% of the population belong to this age group, and 35% of them live in urban areas.

The social benefits of living in urban areas in Timor-Leste can be attested from information provided by the Timor-Leste Survey of Living Standards (TLSLS) conducted in 2007, which for example, showed that the percentage of population living in urban areas with good housing conditions was twice as much compared to those living in rural areas, and the average travel time to hospitals and clinics, secondary schools or bus terminals/stops, was half for those living in rural areas. Additionally, the rate of highest secondary school attainment among young people in 2007, was 26.7% in urban and 9.7% in rural areas respectively, while the rate of ability to both read and write without difficulty was 66.7 in urban areas and 40.4 in rural areas.
rural areas. Nevertheless, as in many other developing countries, the misconceived assumption that urban areas provide better opportunities for economic life can also be observed in Timor-Leste. The evidence from the TLSLS showed that the total unemployment rate in urban areas (11.5%) was significantly higher compared to rural areas (2%). Among young people, 7.1% in rural areas were unemployed whereas in urban areas the percentage was 41.5%.

**Health behaviour among urban and rural dwellers in Timor-Leste**

Broadly speaking, a better education attainment is associated with having a beneficial health behaviour. This means that a better educated person is more likely to avoid risk-taking behaviours leading to vulnerability to contract a disease. In urban areas, better access to health facilities, and better economic status of the population are associated with better use of health-care services. In fact examples in many countries corroborate this assumption, and in Timor-Leste, despite the lack of disaggregated information specifically focused on young people, a health care-seeking behaviour study conducted in 2008 concluded that long distances to health facilities in rural areas discouraged attendance, in particular for non-urgent conditions and preventive care. And during the wet season, even short distances could be a big problem. Moreover, economic factors further complicate access to and use of health facilities in rural areas particularly due to the unaffordable costs associated with referral to another health facility, including hiring transport and accompanying the patient to the facility. Similarly, urban dwellers are likely to be more responsive to healthy behaviour attitudes advocated by health authorities. The TLSLS, for example, found that 68% urban dwellers slept under a mosquito net compared to only 47.3% rural dwellers, and 25.6% children less than 5 years old were fully immunized, compared to 18% in rural areas.

Contrasting this positive association between living in urban settings and the likelihood of practising healthy attitudes is, however, the fact that rural dwellers in Timor-Leste perform better in respect of their purpose of visit to a health-care provider. The TLSLS showed, for example, that 39.8% rural people visited a health-care provider for treatment, and 7.8% for preventive care, compared to 27.9% for treatment, and 5.6% for preventive care in the case of the urban population. This can mean a low awareness of the need to have treatment and preventive care on the part of urban citizens, which can potentially contribute to their poor health status.

**Practices of risk-taking behaviour with regard to alcohol and tobacco use, and of unsafe sex among young people in Timor-Leste**

Literature on alcohol and tobacco use, and on unsafe sex among young people in Timor-Leste is not widely available. Nonetheless, a range of publications provide evidence on the magnitude of the problem in the general population. Firstly, the WHO Global Information System on Alcohol and Health states that the adult per capita consumption of alcohol in Timor-Leste is around 0.4 litres of pure alcohol, and that overall, the recorded consumption has decreased in recent years. Beer accounts for 97% of alcohol consumption, wine 3% and spirits less than 1%, and there is no information about the use of surrogate alcohol. There is also no information about the prevalence and patterns of alcohol consumption and its associated health risk behaviours, particularly among young people.

Secondly, Timor-Leste has one the highest prevalence rates of cigarette smoking among adolescents. The Global Youth Tobacco Survey conducted in 2006 reported that the prevalence rate of cigarette smoking among in-school adolescents in Timor-Leste was...
32.4%, the highest compared to other countries in the South-East Asia Region, and perhaps one of the highest in the world. This prevalence rate was more than twice as high compared to Indonesia (12.6%) and Brazil (15.4%) and eight times higher than Cuba (4.2%). The highest prevalence rate ever reported was for Greece with 16.2%. Two thirds students live in homes where others smoke, while 7 in 10 students are exposed to smoke in public places and two thirds of them have parents who smoke. While there are inadequate data to draw upon, the rate of tobacco use among adults in Timor-Leste in 1995 was 53.9% in men, and 6% in women, while recent estimations put it to be as high as 70-80%. Such high prevalence of smoking among men and in-school adolescents in Timor-Leste can be a sign of unhealthy behaviour having its origins in the post-conflict environment that is getting increasingly urbanized.

Contrasting this seemingly urban sexual behaviour in Dili is the higher percentage of rural population’s knowledge regarding ways to avoid HIV/AIDS. The TLSLS found, for example, that 50.2% rural population felt that use of condoms could prevent HIV/AIDS, compared to only 31.4% urban population, and that 56.7% rural population were of the opinion that avoiding sex with people having many partners could prevent HIV/AIDS, while only 27.2% urban dwellers felt the same way.

### Relationship between urbanization and health behaviour, and risk-taking practices among young people in Timor-Leste

The available evidence summarized in the previous sections does not provide a clear distinction between health behaviour and risk-taking behaviour among young people living in urban and rural areas nor any sign of association between urbanization and health behaviour or risk-taking behaviour among young people. Nevertheless, the following highlights can be proposed. Firstly, it appears that contemporary urban agglomeration in Timor-Leste has a significant component of young people who established themselves in the capital city prior to, and during independence of the country in 2002, in search of a better life. Although there are no studies related to the effects of urbanization on their health behaviour or risk-taking practices, the rate of unemployment which they are subject to can represent a significant precursor to risk-taking practices related to alcohol and tobacco use, as well as to unsafe sexual practices.

Secondly, despite better access to healthcare services and better health practices such as bednet use, the urban dwellers perform worse in respect to the purpose of visits to a health-care provider, as compared with their rural peers. Again, lack of disaggregated health-seeking behaviour data on urban and
rural young people makes it difficult to draw any association between urbanization and health-seeking behaviour of young people. Nevertheless, since 35% young people aged between 15 and 34 years in Timor-Leste live in urban areas, they may as well be reasonably included in the category of those with lower performance with regard to their purpose of visits to a health-care provider.

Thirdly, alcohol consumption, although not alarmingly high, is quite significant among Timor-Leste’s population. As with other behaviours mentioned above, no studies have been conducted in Timor-Leste to ascertain the magnitude of the problem, particularly among the young people living in urban and rural areas, and yet anecdotal accounts widely circulating in the community point to a significant involvement of young urban dwellers of Dili in alcoholic-related behaviour during the periods of political unrest and violence in 2006.

Fourthly, prevalence of cigarette smoking among Timorese males, including adolescents, is the highest in the South-East Asia Region, and perhaps one of the highest in the world. No disaggregated data among urban and rural areas can be found in the results of studies that are available. Nonetheless, as 85% poor people live in rural areas, and one important enabling factor for adolescent smoking in Timor-Leste is having a pocket money of more than US$ 5 a month, it is most unlikely that rural adolescent students would be the most heavy cigarette smokers.

Finally, risky sexual behaviour is high among urban men, but knowledge of effective ways to prevent HIV/AIDS and sexually transmitted infections (STIs), including use of condom and avoiding sex with people having many partners, is higher among the rural population, as compared with people living in urban areas. Despite not providing an accurate association between urbanization and risky sexual behaviour of young men, or positive knowledge on prevention of HIV/AIDS and STIs in rural young men, these findings suggest higher risk-taking sexual behaviour among men living in urban areas.

**Conclusion**

The extent to which urbanization is likely to promote or discourage health-seeking behaviour and risk-taking practices among young people in Timor-Leste is difficult to be established on the basis of the available information. Nevertheless, the existing evidence suggests that the current trends of urbanization, coupled with the ubiquitous poverty in rural Timor-Leste, as well as high unemployment rates in the urban capital city of Dili, are likely to continue to exert their influence, both beneficially and harmfully, on the health-seeking behaviour patterns, and risk-taking practices of Timor-Leste’s citizens. If the right policies aimed at averting the classical consequences of urbanization, including its health hazards, are to be in place, then substantial attention should be given to a more detailed evidence-gathering in this area, which could help policy-makers to devise locally-sensitive interventions for the benefit of everyone’s health in a not-so-distant urbanized Timor-Leste.

**References**


Urbanization dynamics and WHO’s “healthy city” initiatives in the South-East Asia Region

Surinder Aggarwal* and Abdul Sattar Yoosuf**

Abstract
It is an accepted fact that the fast and skewed urbanization process that is presently taking place in the WHO South-East Asia (SEA) Region is becoming a powerful agent of change and is accompanied with economic opportunities, environmental threats and health challenges. The present paper examines primarily the process of urban dynamics and its health challenges in the SEA Region and how the “healthy city” initiatives have responded to this urban challenge to sustain and promote health in various urban settings and vulnerable communities. We present in brief a review of the “healthy cities” programme in countries of the SEA Region and the constraints in engaging the healthy settings process. Finally, we present a critical analysis of the “healthy city” programme in countries of the SEA Region including (i) strengths and limitations of healthy cities projects in South-East Asia; (ii) lessons learnt; (iii) the way forward; and (iv) the future of the healthy settings movement in a fast urbanizing Region.

Context
For the first time, half the world population now lives in urban areas. By 2030, this is expected to swell to almost five billion.1 Furthermore, a large share of new urban growth shall be borne by developing countries like China and India and by emerging mega cities like Bangkok (Thailand), Chittagong (Bangladesh), Hyderabad (India) and Yog Jakarta (Indonesia). Ecological imbalance and environmental degradation caused by abuse and overuse of environmental services pose new threats to human health in urbanizing economies.2 Mega cities are at an even greater risk of disasters through this global urbanization process.3 Meanwhile, globalization accompanied with liberalization of economies diminishes the hope for more investments in social sectors, including health. Such a scenario does not mean that cities will be the villains in future. Rather, they will be the places for future employment. Since most cities suffer from bad governance, financial constraints and lack of inclusive city planning, they become “hot spots” of health risks. A development approach embedded in sustainable development, holistic health and good governance can provide us with a protective environment for improved health and an inclusive society. To realize this vision, the healthy city concept promoted by WHO has even more relevance today for the fast-urbanizing developing countries.

Urban dynamics in the South-East Asia Region
The experience of countries in the SEA Region has been similar; the urban population in the Region exceeded 531 million in 2005, which was about 17% of the global and 34% of...
Asian urban population. The urban population of the Region is expected to reach about 880 million by 2025. The urbanization trends clearly indicate that the Region is urbanizing very fast, cities are getting denser, and the large urban agglomerations are growing faster to comprise a larger share of urban population (Table 1).

The inflow of poor migrants and their settling down in degraded and crowded illegal settings without adequate basic services is the greatest challenge of urban health. The emergence of mega cities with huge slum populations is another disturbing urban phenomenon. Four of the 23 mega cities, including Delhi, Dhaka, Kolkata and Mumbai of the world are located here in the SEA Region and are home to about 15 million slum dwellers. Rising epidemic situations and the fast spread of communicable diseases are strongly linked to the growing densification process of slums in these cities.

Urban experts view such kind of growth and distribution as a natural phenomenon. Countries in the Western world experienced similar trends while they were urbanizing and industrializing more than a century ago. However, what is important for people’s health is not the speed with which urban settlements are growing or how their populations are going to be distributed, but the extent to which effective local response can be developed to promote health, drawing on all possible sectors and utilizing available resources.

Table 1: Selected urban population characteristics in countries of the SEA Region

<table>
<thead>
<tr>
<th>Country</th>
<th>Urban population ('000)</th>
<th>Urban population (%)</th>
<th>Population growth (%)</th>
<th>Population density (persons/sq km)</th>
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</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>108,828</td>
<td>178,731</td>
<td>30.6</td>
<td>50.4</td>
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<tr>
<td>Myanmar</td>
<td>14,700</td>
<td>24,720</td>
<td>24.9</td>
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<td>Thailand</td>
<td>20,352</td>
<td>29,063</td>
<td>29.4</td>
<td>32.9</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>278</td>
<td>732</td>
<td>20.8</td>
<td>27.3</td>
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<td>Bangladesh</td>
<td>39,351</td>
<td>76,957</td>
<td>19.8</td>
<td>25.9</td>
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<td>Bhutan</td>
<td>197</td>
<td>428</td>
<td>7.2</td>
<td>11.8</td>
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<td>India</td>
<td>325,563</td>
<td>538,025</td>
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<td>100</td>
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<td>DPR Korea</td>
<td>14,546</td>
<td>17,697</td>
<td>58.4</td>
<td>62.3</td>
</tr>
</tbody>
</table>

Hyper-urbanization-linked health challenges

With mega urbanization happening in many countries of the Region, most local governments and parastatal institutions have not planned to provide basic amenities, basic health services and affordable housing as they face financial constraints. Compared with other WHO regions, the SEA Region has the lowest level of improvement in sanitation coverage, about 50% (Figure 1).

Access to improved drinking water sources has improved over the years and at least 75% residents now are connected to safe water sources. However, the situation is very bad in urban slums where regular water supply for long hours is still a dream. Solid waste management, even with low per capita generation, remains a big environmental hazard (land degradation, groundwater pollution and flooding) and a serious health risk. Exposure to biomedical waste and e-waste are emerging as new environmental and health challenges. As a result of greater awareness, many countries have enacted strong policies and legal measures to reduce air pollution levels. These measures have resulted in declining trends in major pollutants like carbon dioxide, sulphur dioxide and nitrogen dioxide, etc. (Figure 2). But still, the pollution levels are much higher than the WHO-recommended limits. Financial

Figure 1: Access to improved drinking water sources and sanitation for urban populations of the SEA Region

![Figure 1: Access to improved drinking water sources and sanitation for urban populations of the SEA Region](image)


Figure 2: Concentration of particulate matter (PM$_{10}$) in the SEA Region

![Figure 2: Concentration of particulate matter (PM$_{10}$) in the SEA Region](image)

Source: UNESCAP, Socioeconomic Survey, 2009
constraints, lack of governance and uncontrolled physical expansion of cities have contributed largely to such environmental and infrastructural damages.

Health risks are getting even worse with the added dimension of climate change impacts including flooding of coastal cities, heat stress and exposure to new disease vectors. Natural and man-made disasters (floods, droughts) are also on the rise and threaten food security. Bangladesh, being a low-lying country and having a long coastline in the Bay of Bengal, is severely affected by frequent cyclones and floods now, and with climate change the impact is getting even worse.

Social support systems in big cities are becoming weak and are leading to social alienation and crime, and to alcohol and drug addiction. Alienation of the youth arising from growing unemployment and withdrawal of the social support system lead them to more substance abuse, alcoholism and tobacco abuse. Heavy smoking among men, and the youth in particular, is prevalent across all countries, except Bhutan (Figure 3). With an intense city mobility and stressful work environments, the area of mental health is another new challenge being faced due to the growing urbanization.

Urbanization is considered a significant social determinant of health as the urban system allows and produces spatial and economic inequalities. The WHO Commission on Social Determinants of Health, Special Issue of the Journal of Urban Health on “Achieving health equity in urban Settings” and other publications brought out by the WHO Kobe Centre and the WHO Regional Office for South-East Asia on health inequities clearly establish social gradients (viz. gender, location, education and ethnicity, etc.) on health indicators like infant mortality; access to health care; and safe water and sanitation. Social, economic and spatial gradients are evident in consumption of goods and services across and within most big cities of the Region. There is a strong social gradient across urban settings in countries of the Region when we relate health indicators like children living in slums and diarrhoea episodes; household wealth and sources of drinking water and housing quality. The Self Employed Women’s Association (SEWA), India, case study conducted by the WHO Regional Office for South-East Asia clearly established that empowerment of poor women could translate into upgradation of slum settlements; deliver primary health-care services at doorsteps of the poor; and provide affordable health insurance towards improved health outcomes.

Figure 3: Prevalence of smoking among men in the SEA Region

Source: UNESCAP Socioeconomic Survey, 2009
Note: Data for Bhutan not available
Therefore, the major question for future is how to ensure that health and environment are not damaged by economic progress and growing urbanization trends. The argument here is not to justify anti-urbanism, but to bring about a balance between the two. It further aims at strengthening the individuals and the city governments to be the actors of change, and at encouraging and enabling the communities to develop lifestyles and environments that support positive health in cities of the future. The “healthy cities” approach of WHO initiated during the late 1980s was an appropriate response to such emerging urban, social and environmental challenges across cities, including countries of the SEA Region.

The “healthy city” response

The “healthy city” concept and projects emerged in the Region as a response to deteriorating environmental, social and health conditions associated with urbanization as discussed above. These projects were based on the principles and strategies of health for all and the principles embodied in the Ottawa Charter for health promotion. The “healthy cities” programme (HCP) strategy advocates an inter-sectoral approach to health development that focuses on the environmental, social and economic determinants of health. It aims to bring about a partnership of public, private and voluntary agencies to focus on urban health and to tackle health-related problems within a broad approach. In addition, the HCP aims to build a strong case for public health at the local level and to put health issues onto urban political agendas.

Examples of WHO-facilitated “healthy city” programmes in the SEA Region

The WHO HCP launched in the SEA Region in 1994 covered six cities: Chittagong and Cox’s Bazar (Bangladesh); Bangkok (Thailand); Badulla (Sri Lanka); Kathmandu, Koleshwar (Nepal); and New Delhi (India). However, the progress in healthy cities development was slow due to unclear concepts among local authorities and lack of coordinated urban infrastructure to support the process. In order to address these issues, several local and regional meetings, and workshops were held to improve HCP implementation. A comprehensive review of HCP in selected Member countries of the Region was conducted in 1998, and a SEA Region Healthy Cities Framework for Action was subsequently developed in 1999. This same year an opinion survey was also conducted to seek subjective perspectives from related policy-makers, academics and programme managers. By 2002, the number of healthy city projects, with WHO involvement, had increased to 18 cities in 8 countries of the Region, namely Bangladesh, Bhutan, India, Myanmar, Maldives, Nepal, Sri Lanka and Thailand. It is presently estimated that action at the local level is being taken with regard to 40-50 healthy settings in all countries of the Region.

Review of “healthy cities” programme in countries of the SEA Region

The HCP was initiated by cities in Europe and North America since 1986, just after the Ottawa Conference, and the practice has existed now for about 25 years. Developing countries adopted this approach only in the mid-1990s, which means that it has been in operation now for the past fifteen years. However, given the length of time the programme had been in operation in the Region, it was not replicated in various settings and in the degree expected. This was despite sufficient awareness having been generated through a variety of activities including seminars, training workshops, healthy city days, and training programmes. Thus, a need was felt to evaluate the ongoing HCPs in the Region to better understand the constraints and opportunities from ongoing experiences of the past several years and also seek ways to
more effectively chart out a regional healthy-settings future. Process indicators such as political involvement, collaboration, resource mobilization, participation, institutional change, governance and sustainability were used to learn from ongoing initiatives. The strength and sustainability of a healthy city project, in view of many experts, depends largely on the institutionalization of the above-mentioned processes.

Constraints in engaging the healthy-settings process

The study revealed many constraints that related to understanding, application and sustainability of the practice. First, the lack of a deeper understanding the concept and practice of healthy settings. The idea of healthy settings seems deceptively simple at the surface, for it masks the complexity of the implementation process where sustainability must be the focus. Any health action carried out in a community does not suffice as an example of a healthy-settings label. Its hallmark must be the synergy between the city health plan, the managerial process, and community involvement for ensuring programme sustainability. In most countries of the Region, with government and community leadership continuously in a state of flux because of inevitable job turnovers in the system, such awareness of the concept is often lost in the change, and needs to be continuously kept up to negate the possibility of this comprehensive process slipping into being just another time-bound project and not a sustainable process.

Second, the internal municipal governance bottlenecks also hinder the progress of the process of healthy settings. Lack of coordinated urban infrastructure responsibilities and related turf issues militate against cooperative engagement among municipal players. Structural issues of internal administration and bureaucracy in local governments, even in the currently decentralized situations find limitations. The inability and/or lack of opportunities or forums for working together with other sectoral ministries, while not having a forum to deal with common issues, are the constraining factors. While health issues are the common denominator, policies and mechanisms to address these may be available only in a multitude of sectors. This necessitates collaborative approaches within and outside of participating municipal arms.

Third, to bring holism and empowerment into the healthy-settings process requires that the issue of participation of the poor also be addressed. The analysis reveals that there is little evidence of participation by the poor in the healthy-settings process. And because of their absence in the process, the needs of the poor are often neglected in the agenda of the settings programme. Moreover, even if they were present, perhaps there will still be a need for the management to have an egalitarian mindset in order to give the poor the voice to articulate their needs. This is evident from the prevailing situation in the local government that has little interest in promoting the “settings” idea in slum areas because they are considered illegal/unauthorized settlements.

Another limitation is the low priority that the ministries of health (MoH) accord to preventive services and related policies. Also, chronically low budget allocations, weak organizational structures that fail to accommodate comprehensive programming and collaboration, and the lack of civil service requirements for public health expertise in policy-level positions in MoH act as constraints to advancing “healthy settings” programmes. Most ministries are structured along clinical disciplines, curative health care and vertical programmes. Even budget allocation and mandates are devised along these lines. As such, the administrative process for teamwork is limited or hindered. In as much as there is the need to promote the idea of addressing health
comprehensively, there is a critical need to reassess and evaluate the role that ministries of health must play in these present times of promoting sustainable health development, including capacity-building to effectuate such changed positions.

Even with increasing democratic reforms and decentralization in many countries, governance structures that move the system are still in a timewarp. While there is a move towards democratic governance through empowerment at local levels and inclusiveness in decision-making, the central authority still displays bureaucratic and vertical structures. One would hope to see more delegation and teamwork even at the top levels of ministries in governments to complement and facilitate the change towards greater local autonomy. Unfortunately, even the existing dual-purpose or multi-sector-responsibility-mandated ministries are seen to be fragmenting into uni-sector functionaries, thus having to form lateral linkages all over again for needed coordination. An analysis of why this is so is beyond the scope of discussion here, but perhaps not so in the overall context of a healthy settings programme development discourse.

### Lessons from the “healthy cities/settings” programme in the SEA Region

#### Strengths and limitations of “healthy city” projects

The strengths of the Regional Healthy City programme (or more often referred to as the “healthy-settings” process) are those that address, even in a small way, the factors mentioned above. Thus, the more successful settings embody the aspects of preparing a city plan of action; providing strong commitment towards recruiting human resources and sustaining them; creating a strong awareness among decision- and opinion-makers that the benefit of this process; and building institutional structures like working groups and steering committees.

Weaknesses of the programme primarily relate to concerns regarding sustainability. These concerns comprise the lack of enabling conditions such as absence of strong city-level managerial structures to harmonize the public policy on health; inadequate stakeholder involvement; lack of political motivation; and the demand for external programme funds. Overall, smaller settings appear to be more successful than larger ones.

As “healthy settings” are the geographically demarcated physical terrains in our countries, and as many health development actions are presently taking place in our communities, there could be many “healthy settings” type of actions in operation that we do not even know of. The WHO healthy-city process (and thus, healthy settings also) promotes an idea that is timeless and deceptively simple. A plan, a process of management, and involvement of the community, are all that are needed to keep a healthy-setting process moving forward. Leadership commitment is also essential for such continuity.

### The way forward: challenges and prospects for the future

As a prospect for the future, the following challenges must be attempted to pursue the vision for sustained success of the HCP. These challenges relate largely to political and administrative expediency.

Experience with several initiatives in the Region that were taken up from scratch with support from WHO shows that the burden of achieving success is on WHO as the initiatives are seen to have been initiated at the behest of WHO, and not because of any real need expressed by the “setting” recipients. The experience with many WHO-initiated healthy city programmes in the Region has been that the programmes were taken up on the basis of requests made by the political leadership of the “setting” rather than by enlightened community groups. WHO has used this
approach of entering the healthy-setting process through the political community since politicians possess the power to elicit community support. Also, politically unaligned people, however committed they may be to strengthen their community, find it very hard to create and develop viable community development programmes. The social organization in many Asian societies dictates that there is almost always the need for having a political base for support – and this comes from elected persons such as the Mayor or a district administrator or an elected legislator. To be realistic, with the kind of prevailing political climate it may be surmised that the really committed elected leaders are indeed hard to find. But when we do find one, the hope for sustainability may be lost unless the programme can move towards institutionalizing the approach.

In the SEA Region, “healthy settings” has been taken up as an organizing concept – one that can put many disparate community development efforts at community level into a coordinated whole. However, challenges abound. Programme managers, administrators, political leaders and even donors favour programme visibility over community development effort. WHO therefore needs to widen such limited vision by going beyond it and educating and convincing the managers and operators of HCPs to derive political, social and economic advantages inherent in such initiatives rather than being satisfied with a limited visibility component alone. Such broadened vision will lead towards the sustainability of the programme.

We view the healthy-settings process as a significant contributor to the widening assumption of intersectoral collaborative practices in both urban and rural settings. It is envisaged that lessons from this process will be increasingly replicated into fully-functioning coordinating mechanisms at the district level of national governance. Based on how WHO and its partners can market the approach through an inclusive process (such as the Healthy Environments for Children Alliance, revitalization of primary health care, social determinants of health and the Millennium Development Goals (MDGs), it may open the future to a greater cooperative action among donors, businesses and nongovernmental organizations (NGOs) towards an efficient system of health planning and resource allocation — a process we hope can provide a fertile ground for dialogue and comprehensive action on existing and emerging health priorities in countries by having a more conducive means for unfettered interaction among donors and recipients. We hope to see an increasing evidence of this healthy-settings concept being incorporated into national planning processes as a means of looking at health and development issues more comprehensively using an intersectoral development process. This is a very opportune time as political decentralization is taking place in many countries of the Region.

WHO will continue to provide guidance, facilitation and networking support to Member States of the Region as the above process moves forward. It would keep abreast of new developments (both information and expertise) to keep the support most relevant and timely. Networking is very important for exchanging information among partners and learning lessons. It would also promote mutual comparisons and hopefully some competitive spirit that will drive the programme towards greater excellence in implementation. This will enable exchange of people and ideas for making the regional process more dynamic and thus keep the interest for the programme alive. The Regional Office will maintain a regional database that will link all “settings” that may subscribe to it.

WHO will be focusing mainly on those cities where such sense of responsibility and realizations exist (that municipal work is in effect the same as that to be done under the healthy city programme). This will ensure that whatever little funds it has to offer will be put to good use to promote models of good practice.
under the “healthy cities” umbrella. WHO also wishes to include its own programmatic priorities as demonstration opportunities where such issues are specified in the “healthy cities” action plans. One example in Bangladesh is that of food safety training for healthy city programme staff for selected cities. This way WHO is able to show the benefits of the programme in the city itself rather than providing training to people from all over the country but not being able to monitor if the training has indeed been put to effective use. WHO should have its “healthy cities” mandate to bring clinical, social and preventive aspects of health together. Through other programmatic inputs, WHO may also be able to integrate programmes on malaria, diarrhoeal disease control, community health clinics, tuberculosis, children’s environmental health, tobacco, drug abuse and violence, etc. into HCP.

Many Masters in Public Health (MPH) academic programmes in the Region are adopting HCPs as field practice programmes towards planning, management, implementation, monitoring and evaluation of health projects. Lessons in inter-sectoral collaboration and local-level governance may be learnt from studying the working of these community-level initiatives. More effort is needed, however, to incorporate the healthy city concept and its relevance into a variety of public health-related curricula and field practicum.

At the regional level, WHO will implement an HCP coordinators’ training programme for supporting the increasing need to provide the existing HCP with quality managers who understand the process of logical planning, implementing and evaluating programmes.

Effort will be made to advocate the idea of piggy-backing HCP type of actions into the existing community development programmes. This will of course entail a dialogue with protagonists of these programmes (be they NGOs, development agencies and businesses, etc.) and proposing a win-win approach for the partnership.

WHO will also promote institutional changes to the municipal process towards incorporating HCP actions into municipal plans. The lack of such a process has been shown to be the major reason for ineffective management by municipal staff.

Is there a future for the “healthy settings” movement?

All focal points for the Sustainable Health and Healthy Environments programme and staff in the Regional Office agree that there is a bright future for HCP in the SEA Region. However, they all point to the fact that extensive changes are needed to make HCP effective and sustainable as suggested below. The evaluation provides some specific recommendations to strengthen the implementation of the HCP. However, without the support of all parties involved and a willingness to address the problems that HCP faces, communities will miss out on the benefits of a unique community mobilization programme that could positively affect countless individuals in developing countries of the SEA Region.

Actions needed to sustain the HCP

- Adopt small settings with identifiable issues rather than the whole city or a larger area.
- Use SDH approach to identify unhealthy settings and vulnerable groups.
- Involve the poor, women, civil society and private sector as primary stakeholders.
- Institutionalize the “healthy city” programme to give it legitimacy, visibility and sustainability.
- Sustain the political and administrative acceptance of the HCP by integrating it into a healthy public policy.
- Integrate “healthy city” initiatives into other similar community development programmes.
• Establish /strengthen networking with other cities or with other similar initiatives within the city.

• Sensitize municipal staff on health issues and build their capacity through training on preparing a health plan, resource mobilization, and implementation of the project.

References


Comment

Notes and news

Regional Workshop on Tobacco Surveillance

The Regional Director, Dr Samlee Plianbangchang, addressed the “Regional Workshop on Tobacco Surveillance—Linking Data to Action” held from 8 to 13 February 2010 in Bangkok, Thailand. His message was read on his behalf by Dr Khalilur Rahman, Acting Director, Noncommunicable Diseases and Social Determinants, WHO SEARO.

“Tobacco use is one of the biggest and most pernicious global public health threats today. The WHO South-East Asia Region bears a double burden of tobacco epidemic as it is one of the largest producers and consumers of tobacco, and tobacco use is part of the Region’s social culture. Of over five million annual global deaths from tobacco, 1.2 million occur in the South-East Asia Region alone,” the Regional Director said.

“There is also an urgent need for intense multisectoral collaboration among relevant sectors in the government to deal with tobacco control issues. This workshop should serve as a unique opportunity for all relevant sectors involved in this complex issue, and thereby facilitate cooperation and collaboration among them. I hope that the knowledge and information that will be shared at this workshop will prove useful to participants from Member States in realizing the extent of tobacco epidemic and working for its mitigation,” the Regional Director concluded.

World AIDS Day

A brief function was organized in the Regional Office on 1 December 2009 to commemorate World AIDS Day. In his message (read out by the Deputy Regional Director, Dr Poonam Khetrapal Singh), the Regional Director, Dr Samlee Plianbangchang said, “HIV/AIDS continues to be one of the most formidable public health challenges of our times. The South-East Asia Region has the third-highest HIV burden in the world, accounting for 10% of all people living with HIV/AIDS. HIV infection rates in the Region are much greater among high-risk populations, namely sex workers and their clients, men who have sex with men, and people who inject drugs. An unfavourable legal environment and law enforcement attitudes drive sex workers, people who inject drugs and men who have sex with men underground and beyond the reach of prevention services. There are various social, cultural and economic factors in our societies that increase vulnerability to HIV. Gender disparities remain common in the Region, with women having few rights regarding marriage, inheritance or protection against violence.”

The United Nations General Assembly in 2001 adopted the Declaration of Commitment on HIV/AIDS, which affirmed the commitment to human rights as an essential element of the global response to HIV and AIDS. At the same time, the impact of HIV continued, highlighting the inequities and vulnerabilities leading to increased rates of
infection among women, children, the poor and the marginalized groups.

The Regional Director concluded, “AIDS is likely to stay with us for a long time. For a sustained response, we have to improve the effectiveness and capacities of our health systems through investment in infrastructure and human resources. Only when we have reached, found, treated and cared for every affected man, woman and child can we even begin to think of really achieving universal access and the Millennium Development Goals. Your collaboration should help operationalize the most effective interventions outlined in the various strategies and frameworks that have already been developed. Much-needed services must be brought to the homes and communities where those who need them, live and work.”

“In order to make this year’s theme a reality, WHO will continue supporting countries in their efforts to meet these challenges by providing technical assistance to strengthen health systems and expand coverage of priority interventions. Through our combined efforts we hope to see further progress over the coming years.”

Pandemic influenza vaccine

An informal meeting on Regional Production of Pandemic Influenza Vaccine was held in SEARO, New Delhi on 29–30 October 2009. Speaking on the occasion, the Regional Director, Dr Samlee Plianbangchang said, “So far more than 400 000 cases and, at least 4700 deaths have been attributed to the new pandemic influenza virus worldwide. These figures are conservative estimates. In the South-East Asia (SEA) Region, India and Thailand have reported the highest number of cases. The Region has recorded 43 000 cases and more than 600 deaths to date. The pandemic A(H1N1) 2009 virus has never before circulated among humans on a large scale. Most people, therefore, have little or no immunity to the infection.”

The Regional Director added, “We are approaching the time when we would expect to see a second wave. Some countries have already licensed the vaccine for use, and the United Kingdom commenced vaccinating its people from the third week of October. There is, therefore, the need to accelerate the process while keeping an eye on the safety issue. Member States in the SEA Region have large populations living under difficult socioeconomic conditions, which make them vulnerable to the effects of the pandemic. Vaccines for the SEA Region need to be produced in large quantities.”

Dr Samlee concluded, “We will share the information during this meeting with all Member States in order to help them plan their procurement, prioritization and distribution strategies. Furthermore, the SEA Region needs a considerable amount of vaccine for its large population. Combined efforts between the governments and the private sector are critical, indeed. I hope the meeting will also mull the issue of strengthening public-private partnerships in vaccine production.”
Publications corner

Health financing strategy for the Asia-Pacific region (2010-2015)
WHO Regional Offices for the Western Pacific and South-East Asia Region, 2009, 43 pages, ISBN 9789290614586

Despite impressive economic development in the region, many people suffer financial catastrophe and impoverishment each year because they have to pay for health care. Many others forego health services because of the costs of health care. This reflects insufficient health spending by many countries in the region, limited prepayment mechanisms and safety nets, and an overreliance on out-of-pocket expenditures to finance the costs of health care. Recognizing these concerns, the World Health Organization developed a new health financing strategy for the Asia-Pacific region.

Regional report on status of road safety: the South-East Asia Region
New Delhi, Regional Office for South-East Asia, 2009. 93p. ISBN 9789290223559

The Regional Report on “Status of Road Safety: the South-East Asia Region” was launched in New Delhi, India on 13 November 2009 on the eve of the World Day of Remembrance for Road Traffic Victims. This report is the first broad assessment of road safety at regional level using a standardized survey instrument. A number of road safety experts in the Region, including relevant government authorities, collaborated to develop this state-of-the-art document.

The report reveals that an estimated 288,768 people died on the roads in Member States of the South-East Asia Region in 2007, and that almost three quarters of all road traffic deaths in South-East Asia occurred among the most vulnerable road users, i.e. motorcyclists, pedestrians and cyclists. This report also reaffirms our understanding of the rapid growth of two- and three-wheelers in the Region, which is a major risk factor for road traffic injuries.

The report clearly shows that road safety is still a neglected public health issue; hence specific actions, including policy directions, are needed.

Dengue: Guidelines for diagnosis, treatment, prevention and control

This new edition has been produced to make available to health practitioners, laboratory personnel, those involved in vector control and other public health officials, a concise source of information of worldwide relevance on dengue. The guidelines provide updated practical information on the clinical management and delivery of clinical services; vector management and delivery of vector control services; laboratory diagnosis and diagnostic tests; and surveillance, emergency preparedness and response. Looking ahead, some indications of new and promising avenues of research are also described. Additional and more detailed specific guidance on various specialist areas related to dengue are available from other sources in
WHO and elsewhere, some of which are cited in the references.

This publication is intended to contribute to prevention and control of the morbidity and mortality associated with dengue and to serve as an authoritative reference source for health workers and researchers. These guidelines are not intended to replace national guidelines but to assist in the development of national or regional guidelines. They are expected to remain valid for five years (until 2014), although developments in research could change their validity, since many aspects of the prevention and control of dengue are currently being investigated in a variety of studies.

**Global Health Risks**

Mortality and Burden of Disease Attributable to Selected Major Risks

Nonserial Publication; World Health Organization

This report uses a comprehensive framework for studying health risks that was developed for the World Health Report 2002, which presented estimates for the year 2000. The report provides an update for the year 2004 for 24 global risk factors. It uses updated information from WHO programmes and scientific studies for both exposure data and the causal associations of risk exposure to disease and injury outcomes. The burden of disease attributable to risk factors is measured in terms of lost years of healthy life using the metric of the disability-adjusted life year (DALY). The DALY combines years of life lost due to premature death with years of healthy life lost due to illness and disability.

Health risks are in transition: populations are ageing owing to successes against infectious diseases; at the same time, patterns of physical activity and food, alcohol and tobacco consumption are changing. Low- and middle-income countries now face a double burden of increasing chronic, noncommunicable conditions, as well as the communicable diseases that traditionally affect the poor.

**Water sanitation and hygiene standards for schools in low-cost settings**

Nonserial Publication; Adams, J., Sims, J., Chartier, Y., Bartram, J.
World Health Organization

Adequate provision of water supply, sanitation, hygiene and waste management in schools has a number of positive effects and contributes to a reduced burden of disease among children, staff and their families. Such interventions also provide opportunities for greater gender equity in access to education, and create educational opportunities to promote safe environments at home and in communities.

This book provides guidance on water, sanitation and hygiene required in schools. The guidelines are designed to be used in low-cost settings in low- and medium-resource countries, and to support the development and implementation of national policies. It is aimed at education managers and planners, architects, urban planners, water and sanitation technicians, teaching staff, school boards, village education committees, local authorities and similar bodies.


In this year's WHO Report on the Global Tobacco Epidemic, all data on implementation of the six MPOWER tobacco control measures have been updated through 2008 and additional data have been collected on
selected areas. Categories of policy achievement have been refined and made consistent with guidelines of the WHO Framework Convention on Tobacco Control.

The report also provides a comprehensive overview of the evidence base for protecting people from the harms of second-hand tobacco smoke through legislation. Also, there is a special focus on the status of the implementation of smoke-free policies, with detailed data collected for the first time ever on a global basis at both the national level and for large subnational jurisdictions.

World Malaria Report 2009

The 2009 World Malaria Report summarizes information received from 108 malaria endemic countries and other sources and updates the analysis presented in the 2008 report. It highlights progress made in meeting the World Health Assembly targets for malaria to be achieved by 2010 and 2015, and new goals on malaria elimination contained in the Global Malaria Action Plan.

This report provides data for two additional years, 2007 and 2008. It also describes the status of malaria control both outside as well as inside Africa, the region with the highest burden.

Profiles of 31 countries are presented. About three countries with the highest malaria burden were chosen from five of the six WHO Regions. The other profiles are those of the 20 countries with the highest burden in the African Region.

Mental Health Systems in Selected Low- and Middle-Income Countries
A WHO-AIMS Cross-national Analysis
Nonserial Publications

This report summarizes descriptive data on mental health systems of selected low-and middle-income countries (LAMICs) using the World Health Organization Assessment Instrument for Mental Health Systems (WHO-AIMS).

Results suggest that a systematic assessment of mental health systems is possible in LAMICs. The comprehensive and detailed information gathered through WHO-AIMS and summarized in this report provides a better understanding of mental health systems in these countries. Results indicate that mental health resources and activities are scarce, inequitably distributed and inefficiently used; community-based mental health services are underdeveloped; mental health systems are often not well connected to other relevant sectors, such as the primary health care system; and that insufficient attention is given to human rights.
Acknowledgements

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Guidelines for contributors

THE Regional Health Forum seeks to inform and to act as a platform for debate by health personnel including policy-makers, health administrators, health educators and health communicators.

Contributions on current events, issues, theories and activities in all aspects of health development are welcome. Contributions should be original and contain something of interest to those engaged in health policy and practice, some lesson to be learned, some idea, something that worked, something that didn’t work, in fact anything that needs to be communicated and discussed on a broader scale. Articles, essays, notes, news and views across the spectrum of health development will be published.

Every year, the April issue of the Forum is dedicated to the World Health Day theme of the year.

Papers for submission should be forwarded to the Editor, Regional Health Forum, World Health Organization, Regional Office for South-East Asia, World Health House, Indraprastha Estate, Mahatma Gandhi Road, New Delhi 110002, India (E-mail address: editor@searo.who.int).

Contributions should:
• be in English;
• be written in an anecdotal, informal, lively and readable style (so that sophisticated technologies, for example, may be easily understood);
• be in MS Word and sent on-line to editor@searo.who.int
• not normally exceed 3 000 words with an abstract (approx. 250 words) and a maximum of 30 references.

Letters to the editor should normally be between 500-1000 words with a maximum of six references.

Responsibility of authors

Authors are responsible for:
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• obtaining permission to use copyrighted material (if used). The letter granting such permission should be attached to the manuscript when submitted;
• obtaining permission from appropriate governmental authorities if the contribution pertains to a government programme/project and contains material/statistics/data derived from government sources;
• ensuring that all abbreviations (if used) are explained;
• giving their full names, the name and address of their institutions, and an exact description of their posts;
• declaring sources of funding for the work undertaken, and
• disclosing at the time of submission, information on financial conflict of interest that may influence the manuscript. They may also choose to declare other interests that could influence the results of the study or the conclusions of the manuscript. Such information will be held in confidence while the paper is under review, and if the article is accepted for publication the editors will usually discuss with the authors the manner in which such information is to be communicated to the reader.

Tables and illustrations

• The use of tables and illustrations should be restricted to those that clarify points in the text.
• All illustrations and tables should be numbered consecutively and should be lightly marked on the back with the figure number, and the author’s name indicated.
• Graphs and figures should be clearly drawn and all data identified.
• Photographs should be on glossy paper, preferably in black and white.
• Each table should be submitted on a separate sheet of paper.

References

• References should be numbered consecutively as they occur in the text.
• Journal titles should be written out in full (i.e. not abbreviated).
• A reference to a contribution in a book should include the chapter title and page range.

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