Regional Health Forum
WHO South-East Asia Region
Editorial

The main objective of the Regional Health Forum is the exchange of information, experiences, ideas and opinions on all aspects of public health and health development. The publication is intended to serve as a platform where people can express their views, observations and experiences rather than as an official medium of the World Health Organization’s policy or as reference material.

The focus of this issue is “road safety is no accident”, the theme of World Health Day 2004. We have tried to include articles on various aspects of road safety, which may be of interest to readers. Articles include challenges of road traffic injury in this part of the world, epidemiological analyses of road traffic injuries, strengthening facilities for the care of the injured, and strategies for reducing traffic accidents. Other subjects covered include women’s health, noncommunicable diseases and health care financing. The section on WHO/SEARO Notes and News and Book Reviews may also be of interest.

Readers are invited to forward their contributions in the form of articles, essays, letters, or comments written in an informal, anecdotal style. Suggestions on improving the Forum are also welcome.
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Regional Health Forum — Volume 8, Number 1, 2004
Road Safety

The Challenge of Road Traffic Injury in South-East Asia: Moving Beyond Rhetoric

By
Gyanendra Sharma*, Madan Upadhyay**, Sawat Ramaboot#

Introduction
Around the world, almost 16,000 people die from injuries every day. Of these deaths, road traffic injuries (RTIs) take the greatest toll. Road traffic injuries are an emerging challenge to public health in the world. They kill about 3,000 people and about 30,000 are injured and disabled for life every day. Developing countries account for 90% of global road traffic deaths, while accounting for only 20% of cars being driven worldwide. Therefore, the epidemic of road traffic injuries in developing countries is still in its early stages. However, it threatens to grow exponentially unless swift action is taken to counter it.

Road traffic injuries are the ninth leading cause of deaths globally, and are estimated to rank sixth by the year 2020. However, if the burden of disease (represented by Disability Adjusted Life Years or DALYs) is taken into account, road traffic injuries are estimated to rank as the third leading cause of death by 2020.

The burden of road traffic injuries has been rising rapidly in South-East Asia (SEA) as countries are getting increasingly motorized. An estimate shows that SEA is the Region that will experience a sharp rise (more than 144%) in road traffic deaths by the year 2020 if the current trend continues. On the other hand, high-income countries will register a decline of 27% by 2020.

Countries of the SEA Region are mostly motorizing countries, where transportation and mobility are considered to be developmental issues. Despite available estimates, only limited information is disaggregated by countries, by categories of victims, and the level of motorization.

This paper examines the pattern of injuries in the SEA Region in general, based

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on data disaggregated into categories as mentioned above.

Methods

The most recent global burden of disease database published in the World Health Organization's website for World Health Report 2003 was accessed. The database is an estimate based on the global burden of disease assessment tool. The World Health Report divides deaths and disabilities first into three broad groups: communicable diseases, maternal and perinatal conditions and nutritional deficiencies; noncommunicable conditions/diseases, and injuries. Next, deaths and disabilities within each of these groups are divided into categories. For example, injuries are divided into unintentional and intentional. Road traffic injuries (RTIs) are a sub-category of unintentional injuries as per this classification.

The mortality statistics are estimated for the Region, based on the mortality statistics submitted by Member countries to the World Health Organization. Necessary adjustments have been made for under-reporting, based on the findings of surveys. The burden of disease, measured by DALYs lost, includes the total number of premature years of life lost and total number of years lived with disabilities. DALYs therefore, are the summary measure that take account of death, illness and disability. The mortality rate has been calculated per 100,000 population per year.

The South-East Asia Region of WHO comprises 11 Member States: Bangladesh, Bhutan, Democratic People’s Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste.

Results

RTIs account for 20% of all injury-related deaths (Figure 1) and 23% of injury-related burden of disease in South-East Asia. The proportion of mortality and burden of disease from RTIs is higher than any other single external cause of injuries. In terms of figures, RTIs accounted for 296,000 deaths and 10 million DALYs lost in the SEA Region. Of these, most injuries and deaths are reported from the most productive age group: 15 to 59 years. Males account for three times the number of deaths of females.

![Figure 1: Injury-related mortality in the SEA Region, 2002 estimates](source: WHO, Geneva, The World Health Report, 2003)
Table 1: Distribution of road traffic injury mortality and burden by age and sex in the SEA Region, 2002 estimates

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Males</th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaths</td>
<td>Mortality Rate per 100 000</td>
<td>DALYs</td>
<td>% of DALYs</td>
<td>Deaths</td>
<td>Mortality Rate per 100 000</td>
</tr>
<tr>
<td>0-4</td>
<td>3 614</td>
<td>3.9</td>
<td>278 536</td>
<td>3.9</td>
<td>5 842</td>
<td>6.7</td>
</tr>
<tr>
<td>5-14</td>
<td>15 080</td>
<td>8.5</td>
<td>971 178</td>
<td>13.6</td>
<td>8 434</td>
<td>5.0</td>
</tr>
<tr>
<td>15-29</td>
<td>64 119</td>
<td>28.6</td>
<td>2 868 183</td>
<td>40.0</td>
<td>13 139</td>
<td>6.3</td>
</tr>
<tr>
<td>30-44</td>
<td>65 311</td>
<td>39.3</td>
<td>1 981 617</td>
<td>27.7</td>
<td>11 833</td>
<td>7.6</td>
</tr>
<tr>
<td>45-59</td>
<td>45 382</td>
<td>46.9</td>
<td>837 510</td>
<td>11.7</td>
<td>16 383</td>
<td>17.4</td>
</tr>
<tr>
<td>60-69</td>
<td>14 997</td>
<td>42.0</td>
<td>151 225</td>
<td>2.1</td>
<td>6 493</td>
<td>16.8</td>
</tr>
<tr>
<td>70-79</td>
<td>11 748</td>
<td>69.3</td>
<td>63 687</td>
<td>0.9</td>
<td>5 643</td>
<td>29.1</td>
</tr>
<tr>
<td>80+</td>
<td>4 933</td>
<td>116.1</td>
<td>11 713</td>
<td>0.2</td>
<td>2 908</td>
<td>53.6</td>
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<td>All Ages</td>
<td>225 183</td>
<td>27.7</td>
<td>7 163 648</td>
<td>100</td>
<td>70 675</td>
<td>9.1</td>
</tr>
</tbody>
</table>


Discussion

The mortality rate from RTIs in the SEA Region is among the highest in all regions. Of all WHO regions, the South-East Asia and Western Pacific Regions account for almost equal number of deaths. However, the burden of disease is higher in the SEA Region than the Western Pacific Region. Globally, males have a higher road traffic injury rate and young males have a higher rate than females or children and older persons of the same age group. In India, road traffic deaths are ranked as the seventh leading cause of death for all ages. For children aged 5-14 years, road traffic deaths are ranked as the second leading cause of death, next only to childhood diseases. For the age group: 15 to 29 years as well, there were 73 000 road traffic deaths ranking second only to deaths from HIV/AIDS. In other countries of South-East Asia, road traffic injury was the leading cause of death for the same age-group, as per the World Health Report, 2003. Therefore, prevention of road traffic injuries needs urgent attention from public health authorities.

This increase in road traffic fatalities are estimated by: (1) taking account of the historical trend of motorization and road fatalities that will continue if no interventions were taken; (2) incorporating the future increase in population, and (3) change in income level of countries. The estimates also take into account the different levels of under-reporting of road traffic fatalities.

In countries of the SEA Region, rapid motorization of two-wheelers and four-wheelers, inadequate safety features for mixed traffic (slow and fast, motorized and non-motorized, heavy and light vehicles), inadequate legislation for and enforcement of compulsory seat belts, measures to restrain
Road Safety

drunken driving, poor consideration for safety measures in road engineering and road rehabilitation, speeding and lack of speed control measures are some of the major factors responsible for the increasing RTIs. Though countries in the SEA Region have laws/regulations for wearing of seat belts and helmets, they are poorly enforced. The level of utilization of seat belts and helmets for motorcycle riders (except in capital cities of some countries) is very low.

Measures that have proved successful in reducing road fatalities in high-income countries need to be adapted by developing countries, and local measures need to be identified. This is because the incidence of RTIs is disproportionately high among pedestrians, motorcycle and bicycle riders, public vehicle occupants and other vulnerable road users.

Public health authorities in developed countries have been showing keen interest in mitigating the RTI challenge since many years. The World Health Assembly, as early as 1974, endorsed a resolution urging Member States to tackle RTIs as an emerging public health problem. Several developed countries took up the issue and have since tried several approaches towards mitigating the problem. Through failures and successes, new strategies have been developed and implemented. As a result, far less number of deaths now result from road traffic injuries in these countries than in developing countries, both by population and by the level of motorization. Several efforts are under way to further reduce traffic deaths and injuries. The success of all these efforts is visible by the fact that road traffic deaths and injuries are declining and are estimated to decline further in these countries.

The forty-seventh session of the Regional Committee for South-East Asia recognized that injuries were ranked among the five highest causes of mortality and urged Member States to take several initiatives including setting up trauma care and management facilities, and introducing policies and legislation, and promoting safe practices for prevention and control of injuries. With a regional strategy developed in South-East Asia for injury prevention and several initiatives being taken at policy level, the time has now come to translate policy into action. The World Health Day 2004 also provided a forum for advocacy in allocating more attention and resources in preventing road traffic injuries.

Public health has made enormous strides in the advancement of human health, preventing diseases, developing a system of accessible health care, and in promoting health. The number and specificity of public health interventions have been expanded to include communicable diseases, conditions related to maternal and child health, and noncommunicable diseases and their risk factors (including tobacco). The health of children has improved as a result of which we have reduced infant and under-five mortality, less mothers are dying because of improved maternal health monitoring and care; and tuberculosis and malaria are no longer diseases of misery. Visiting tropical places and working in tropical conditions has become safer than ever before. The greatest achievement of all these efforts has been the eradication of Small Pox. Polio is on the verge of eradication. We cannot overstate
how important these accomplishments are or how difficult they were to achieve.

The following are the two predominant approaches that led to these advancements:

1. Focus by national governments on setting international norms that created a body of knowledge and understanding of prevention measures and approaches, and their commitment to support the implementation of this knowledge, and

2. Implementing, sustaining and monitoring of public health programmes according to international guidance, by governments, non-governmental organizations and civil society with adequate back-up of infrastructure and skills.

The response to preventing road traffic injuries cannot and should not be different from other public health responses. Enhancing public health response to include road traffic injuries requires obtaining commitment from professions in addition to public health, one that incorporates many more people and sectors of society than are currently engaged. It also requires the development of comprehensive and strategic approaches that can only be accomplished by using a far broader array of tactics than currently in use.

The momentum of response to RTIs as a global crisis needs serious attention, and we must search for more effective strategies to end the pandemic of road traffic injuries. The commitment from Heads of State, WHO, the World Bank, United Nations and the international community from around the globe has provided a platform on which we can work together. The action deserves no delay, as every hour is witness to the scourge of deaths, injuries and disabilities on the road.

References

2. World Health Report 2003
3. Injuries in South-East Asia: Priority for Action
Abstract

Among 30,554 population, there were 680 traffic injuries with (IR) 22.3 per 1,000 population. Of the total injuries, 69% occurred in the age group of 15 to 35 and males were four times more affected than females. The business group had a higher incidence (IR 44.0) followed by the service group (IR 40.1) and the labour group (IR 28.9). The annual incidence was highest among people with sixth to eighth class education level (5.3), followed by graduates (3.6). Limbs (62.2%) were the most affected part followed by head injury (11.2%). Superficial injuries were most common (47.4%), followed by fractures (20.7%), crush injuries (14.1%) and concealed injuries (12.4%). 19.3% injuries occurred during recreational activity. Majority of the injured victims (92.4%) were administered treatment within six hours while 70.0% availed treatment within one hour of injury. Majority of injured victims took treatment from a nearby private clinic (44.4%), followed by treatment from government hospitals (26.8%) and private hospitals (16.0%). Outpatient treatment was required by 47.1%; 5.9% were hospitalized; 9% of patients were critically ill due to injuries, 1.8% had to be operated upon, and 1.3% had to be admitted to Intensive Care Units (ICU). Most of the victims resumed work within 2-4 days of injury (19.3%), followed by 5-7 days absence from work (14.7%), while 13.4% could not resume normal work for 1-2 months. Injury was more common among two-wheelers used by the victims (46.3%), and among pedestrians (24.85%).

Introduction

Due to the fast pace of modernization, basic needs including the requirement of a vehicle for transportation are expanding rapidly and resulting in an epidemic situation of injury everywhere including developing countries. The risk factors are increasing in some developing countries; for example, motor

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vehicle ownership may double within five years causing streets and highways to become choked by inadequately maintained vehicles\(^1\). According to the World Health Report 2002, of the global burden of injury, 30.3% morbidity and 28.7% mortality occurred in the South-East Asia Region\(^2\). According to a report of the Ministry of Home Affairs, Government of India, one accident occurs every two minutes and one suicide every five minutes in India, with the accident rate corresponding to 45 per 100,000 population. Delhi ranks fifth among other states/Union Territories of India in respect of accidents. In 1999, India had 40,939,000 vehicles and 306,400 road traffic accidents, which correspond to a rate of 7.5 accidents/1,000 vehicles. Of the total 340,454 accidental injuries and 244,412 accidental deaths, 95.3% injuries (324,520) and 33.2% deaths (81,036) were due to road traffic, which correspond to rates of 7.9 and 2.0 per 1,000 vehicles respectively. The sex ratio of road traffic injury in India was 4.5 males: 1 female\(^3\). The Registrar General of India’s report on the survey of causes of death (rural), 1993 shows that 8.7% mortality was due to accidental injuries\(^4\). According to the National Road Transport Council and Trauma Cases Association, at least 25,000 lives are lost every year due to road accidents in India. India has only 1% of vehicles in the world but accounts for nearly 6% of the total cases of unintentional injuries. The unintentional injury rate in India is 34.6/10,000 vehicles, while the accident rates in USA and Sweden are only 14 and 4.8 respectively\(^5\). The cost of injury estimated for both developed (USA) and developing (India) countries is equally high as compared to the countries’ per capita income i.e. the ratios of cost per fatality: per capita income are 20:1 and 17:1 respectively\(^6,7\).

### Methods

A sample size\(^8\) of 30,554 population residing in 5,412 households of the Municipal Corporation of Delhi (MCD) was selected for this study by using the systematic random sampling method. A semi-structured interview schedule was used to collect retrospective one-year data on epidemiological factors of traffic injuries in October 2002. The definition of injury used for this study is “External force/non-contagious substance, striking the body or entering into the body and causing anatomical discontinuity of tissue or derange physiological function of body”. The study included all major injuries caused by the involvement of at least one moving vehicle but did not include minor injuries which did not need any treatment or did not affect work and were not recallable at the time of interview. Funds for this study were provided by the World Health Organization, South-East Asia Regional Office.

### Results

#### About the area of study

As per the 2001 census, Delhi had a population of 13,803,085 within an area of 14,835 sq. km., out of which 97% population (13,383,877) resided in the area of MCD\(^9\). In the area of study, most of the families were nuclear (59.4%) as compared to joint families (40.6%). Majority of households had five-six members (38.2%) or three-four members (30.2%). However, there were large families too with seven-eight
members (15.6%) or more than nine members (11.6%).

Magnitude of injury

Among the 30,554 population surveyed, there were 2,232 major injuries either affecting work or for which treatment was availed, which corresponded to an annual incidence of 73.1 per 1,000 population (morbidity 62.5; disability 9.0, and mortality 1.5). Out of 2,232 injuries, 680 were traffic injuries which corresponded to an annual incidence of 22.3 per 1,000 population (18.5 morbidity, 3.4 disability, and 0.4 mortality). Apart from these major injuries, 1,334 minor injuries including 206 traffic injuries were noted during the last one year which did not affect work and did not need any treatment except application of routine antiseptic lotions like minor cuts during shaving or other routine work. These minor injuries corresponded to an annual incidence of 43.7 per 1,000 population (6.7 for traffic injuries). The annual incidence of the combined minor and major injuries was noted as 116.7 per 1,000 population (29.0 for traffic injuries). The morbidity pattern of injuries shows maximum cases of falls (38%) followed by traffic (31%), mechanical injuries (11%), burns (8%), and animal-bites (7%) etc. as shown in Figure 1.

Epidemiological Factors of Traffic Injury

Host factors

Age: The incidence of traffic injury per 1,000 population was high in the age group of 15 to 55 years but the total number of injuries were more in the age group of 15 to 35 (69% i.e. 470 out of 680) as shown in Figure 2.

Sex: The annual incidence of injury was noted to be four times higher among males (IR 17.6) as compared to females (IR 4.7).

Occupation: The business group was noted to have a higher incidence of traffic injury (IR 44.0), followed by the service group (IR 40.1) and the labour group (IR 28.9). Housewives had the least incidence of traffic injuries (IR 11.3) as shown in Figure 3.
Education: The annual incidence of traffic injuries per 1000 population was the highest among people with an education level corresponding to class sixth to eighth, followed by 3.6 among graduates and 3.4 among those with an educational level corresponding to class ninth to twelfth. However, injuries were less common among the lower educational group. As seen from the Figure 4, traffic injuries were higher among the educated group of people.

Marital status: The annual incidence of traffic injuries was more common in the married group (IR 10.4) as compared to those in the separated or divorced group (IR 0.1).

Part of Body: As shown in Table 1, limbs (62.2% i.e. 41.3% lower limbs and 20.9% upper limbs) were the most affected parts of the body in majority of traffic injuries followed by head (11.2%), while abdomen and thorax injuries were much less common among traffic injury victims. Out of total 680 injury cases, 152 were noted to lose consciousness immediately after the injury event and of them, 29 recovered consciousness immediately while 123 remained unconscious for longer time.

Type of Injury: As per distribution of injury cases according to type of injuries, superficial injuries were found to be the most common (47.4), followed by fractures (20.7%); crush injuries (14.1%), and concealed injuries (12.4%). Among bleeding cases, blood transfusion was more frequently given among traffic injuries (31 cases) (See Table 1).

Ailment at the time of injury: While 1.9% reported to have consumed alcohol/drug, and 1.0% reported acute illness prior to the accident; these could be predisposing factors for traffic injuries (See Table 1).

Activities at the time of Injury: Out of 680 injury cases, 19.3% injuries occurred during recreational activities, followed by 3.1% which were attributed by respondents due to hurry and 1.9% due to fatigue after work. These risk factors may play a significant role in the occurrence of traffic injuries (See Table 1).
Table 1: Distribution of 680 various types of road traffic injuries affecting different parts of the body and their predisposing factors, Delhi, 2002

<table>
<thead>
<tr>
<th>Part of the body</th>
<th>Type of injury</th>
<th>Type of ailment</th>
<th>Nature of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>76 (11.2%)</td>
<td>322 (47.4%)</td>
<td>Acute illness 7 (1.0%)</td>
</tr>
<tr>
<td>Neck</td>
<td>13 (1.9%)</td>
<td>Crush injury 96 (14.1%)</td>
<td>Chronic illness 3 (0.4%)</td>
</tr>
<tr>
<td>Chest</td>
<td>13 (1.9%)</td>
<td>Sprain 23 (3.4%)</td>
<td>Disability 13 (1.9%)</td>
</tr>
<tr>
<td>Abdomen</td>
<td>7 (4.4%)</td>
<td>Fracture 141 (20.7%)</td>
<td>Alcoholism/drug addiction 3 (0.4%)</td>
</tr>
<tr>
<td>Limbs</td>
<td>394 (62.2%)</td>
<td>Concealed injury 84 (12.4%)</td>
<td>Mental stress 6 (0.9%)</td>
</tr>
<tr>
<td>Other</td>
<td>125 (18.4%)</td>
<td>Others 14 (2.0%)</td>
<td>None 638 (93.8%)</td>
</tr>
</tbody>
</table>

Environmental Factors

Months of the year: The maximum number of injuries occurred in July, August and September (387 cases), which is the hot-wet season in this part of India.

Time of occurrence of injury: As observed from the study data, most injuries occurred between Indian Standard Time (IST) 15-18 hours (146), followed by: between IST 12-15 hours (123), and between IST 18-21 hours (117) (See Figure 5).

Local environmental condition of the place of injury: Out of 680 injured victims, it was observed that 30.3% injuries occurred in congested areas, 7.2% occurred due to faulty designing, 26.8% due to poor visibility and 27.6% due to unfavourable weather conditions (See Table 2).
Table 2: Local environmental condition of the place of road traffic injury, Delhi, 2002

<table>
<thead>
<tr>
<th>Condition of environment</th>
<th>Congested area</th>
<th>Faulty design</th>
<th>Visibility</th>
<th>Unfavourable weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>206 (30.3%)</td>
<td>49 (7.2%)</td>
<td>182 (26.8%)</td>
<td>188 (27.6%)</td>
</tr>
<tr>
<td>No</td>
<td>444 (65.3%)</td>
<td>500 (76.8%)</td>
<td>457 (67.2%)</td>
<td>443 (65.1%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>30 (4.4%)</td>
<td>41 (6.0%)</td>
<td>41 (6.0%)</td>
<td>49 (7.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>680 (100%)</td>
<td>680 (100%)</td>
<td>680 (100%)</td>
<td>680 (100%)</td>
</tr>
</tbody>
</table>

Table 3: Distribution of the 680 road traffic injury cases according to the type of vehicle (including pedestrians) involved during the accident, Delhi, 2002

<table>
<thead>
<tr>
<th>Type of vehicle (including pedestrians)</th>
<th>Victim vehicle</th>
<th>%</th>
<th>Hitting vehicle</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle</td>
<td>96</td>
<td>14.1</td>
<td>35</td>
<td>5.2</td>
</tr>
<tr>
<td>Two-wheeler</td>
<td>315</td>
<td>46.3</td>
<td>167</td>
<td>24.6</td>
</tr>
<tr>
<td>Three-wheeler</td>
<td>35</td>
<td>5.2</td>
<td>94</td>
<td>13.8</td>
</tr>
<tr>
<td>Car</td>
<td>25</td>
<td>3.7</td>
<td>102</td>
<td>15.0</td>
</tr>
<tr>
<td>Bus</td>
<td>12</td>
<td>1.8</td>
<td>45</td>
<td>6.6</td>
</tr>
<tr>
<td>Truck/tempo</td>
<td>5</td>
<td>0.7</td>
<td>49</td>
<td>7.2</td>
</tr>
<tr>
<td>Rail</td>
<td>0</td>
<td>0.0</td>
<td>6</td>
<td>0.9</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>169</td>
<td>24.9</td>
<td>49</td>
<td>7.2</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
<td>3.4</td>
<td>182</td>
<td>26.8</td>
</tr>
<tr>
<td>Total</td>
<td>680</td>
<td>100</td>
<td>680</td>
<td>100</td>
</tr>
</tbody>
</table>

Agents/Factors Causing Traffic Injury

Type of vehicle involved: The injury data regarding the type of vehicle involved in traffic accidents show that injury was more common among occupants of two-wheelers (46.3%) and pedestrians (24.9%). More often, the hitting vehicles were two-wheelers (24.56%), followed by cars (15%) and three-wheelers (13.82%) (See Table 3).

Cause of event: High speed (31.03%) and congested roads with high vehicular density (20.44%) were the leading factors for occurrence of traffic injury. The other major factor was badly-maintained slippery roads (16.47%) (See Table 4).

Table 4: Distribution of road traffic injured victims according to the cause of event, Delhi, 2002

<table>
<thead>
<tr>
<th>Cause of event</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical fault of vehicle</td>
<td>43</td>
<td>6.32</td>
</tr>
<tr>
<td>High speed</td>
<td>211</td>
<td>31.03</td>
</tr>
<tr>
<td>Congested road</td>
<td>139</td>
<td>20.44</td>
</tr>
<tr>
<td>Poor light</td>
<td>19</td>
<td>2.79</td>
</tr>
<tr>
<td>Slippery/ill-maintained road</td>
<td>112</td>
<td>16.47</td>
</tr>
<tr>
<td>Obstacle</td>
<td>31</td>
<td>4.56</td>
</tr>
<tr>
<td>Fault of pedestrian</td>
<td>24</td>
<td>3.53</td>
</tr>
<tr>
<td>Other</td>
<td>101</td>
<td>14.85</td>
</tr>
<tr>
<td>Total</td>
<td>680</td>
<td>100</td>
</tr>
</tbody>
</table>

Post-Injury Care and Disability Factors

Transportation used for reaching Medical Centre: As shown in Table 5, autos/taxis (35.7%) were observed to be the most commonly used mode of transport to reach the health set-up for treatment in majority of
cases, followed by bicycles (9.4%); ambulances (4.9%); public transport (4.1%), and two-wheelers (2.1%). Ambulance was not a frequently used transport. Police Control Room (PCR) vans were more commonly used vehicles. The use of these vehicles was largely dependent on their easy availability nearby at the time of injury.

**Time lapse between injury and treatment:** In the study conducted, the majority of injured victims (92.4%) availed treatment within six hours, while 70.0% availed treatment within one hour of injury. Transportation facility and availability of health facilities did not appear to be a problem in this study area (Table 5).

**Health facility providing treatment:** The majority of the injured victims had taken treatment from a nearby private clinic (44.4%), followed by government hospitals (26.8%) and private hospitals (16.0%). Government dispensaries were utilized only in 3.1% cases, which were open only during specific hours of the day (See Table 5).

**Nature of treatment received:** It was observed from the study that in majority of cases, the victims took outdoor (OPD) level treatment (47.1%) and first-aid treatment only (25.9%). Out of a total of 680 cases of road traffic injuries, 9.0% victims were in critical condition; 5.9% were hospitalized, 1.8% were operated upon, and 1.3% were admitted to ICU (See Table 5).

**Number of days of hospitalization:** 56.5% of the victims were discharged within 1 to 4 days (See Table 6).

### Table 5: Post-injury care of 680 road traffic injuries, Delhi, 2002

<table>
<thead>
<tr>
<th>Vehicle used for transportation</th>
<th>Time interval</th>
<th>Nature of treatment</th>
<th>Agency of treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
<td>1 hour</td>
<td>First-aid only</td>
<td>Govt. dispensary</td>
</tr>
<tr>
<td>171 (25.1%)</td>
<td>475 (70.0%)</td>
<td>176 (25.9%)</td>
<td>21 (3.1%)</td>
</tr>
<tr>
<td>Bicycle</td>
<td>1-6 hours</td>
<td>Out-patient</td>
<td>Govt. hospital</td>
</tr>
<tr>
<td>64 (9.4%)</td>
<td>152 (22.4%)</td>
<td>320 (47.1%)</td>
<td>162 (26.8%)</td>
</tr>
<tr>
<td>2-wheeler</td>
<td>24 (3.5%)</td>
<td>Emergency care</td>
<td>Private clinic</td>
</tr>
<tr>
<td>14 (2.1%)</td>
<td>243 (35.7%)</td>
<td>123 (18.1%)</td>
<td>302 (44.4%)</td>
</tr>
<tr>
<td>Auto./taxi</td>
<td>12-24 hours</td>
<td>Hospitalized</td>
<td>Private hospital</td>
</tr>
<tr>
<td>243 (35.7%)</td>
<td>10 (1.5%)</td>
<td>40 (5.9%)</td>
<td>109 (16.0%)</td>
</tr>
<tr>
<td>Bus/Public</td>
<td>&gt; 24 hours</td>
<td>Intensive care</td>
<td>Self</td>
</tr>
<tr>
<td>28 (4.1%)</td>
<td>19 (2.8%)</td>
<td>9 (1.3%)</td>
<td>66 (9.7%)</td>
</tr>
<tr>
<td>Ambulance</td>
<td>-</td>
<td>Major operation</td>
<td>-</td>
</tr>
<tr>
<td>33 (4.9%)</td>
<td>-</td>
<td>12 (1.8%)</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 6: Post-injury disability of 680 road traffic injuries, Delhi, 2002

<table>
<thead>
<tr>
<th>No. of days</th>
<th>Work affected</th>
<th>Hospitalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1</td>
<td>16 (2.3%)</td>
<td>27 (4.0%)</td>
</tr>
<tr>
<td>2-4</td>
<td>145 (21.3%)</td>
<td>36 (5.3%)</td>
</tr>
<tr>
<td>5-7</td>
<td>105 (15.4%)</td>
<td>24 (3.5%)</td>
</tr>
<tr>
<td>8-10</td>
<td>39 (5.7%)</td>
<td>12 (1.8%)</td>
</tr>
<tr>
<td>11-14</td>
<td>5 (0.7%)</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>15-21</td>
<td>58 (8.5%)</td>
<td>9 (1.3%)</td>
</tr>
<tr>
<td>22-28</td>
<td>12 (1.8%)</td>
<td>3 (0.4%)</td>
</tr>
<tr>
<td>29-60</td>
<td>82 (12.1%)</td>
<td>4 (0.5%)</td>
</tr>
<tr>
<td>61-90</td>
<td>14 (2.1%)</td>
<td>3 (0.4%)</td>
</tr>
<tr>
<td>&gt; 90</td>
<td>12 (1.8%)</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>Other</td>
<td>192 (28.2%)</td>
<td>560 (82.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>680 (100%)</td>
<td>680 (100%)</td>
</tr>
</tbody>
</table>
Work loss due to injury: Most victims resumed work within 2-4 days of injury (19.3%), followed by 5-7 days of work loss (14.7%), while 13.4% could not resume normal work for 1-2 months (See Table 6).

Discussion

Prevention and care of injury is a multidisciplinary area and requires intersectoral coordination for planning. Presently, most developing countries do not have any surveillance system nor planning for injury prevention. Lack of efficient surveillance system results in biased reporting of injury by different agencies, for example, traffic injuries constitute 95.7% of all injuries according to police department[^3], however, only 31% were found to be due to traffic injuries in the present study. This may be because most traffic injuries are medico-legal and are reported to the government through the police department. Other types of injuries not having medico-legal implications might get treated either at government or private health set-ups and therefore, remain under-reported. The current study shows that 45.4% of injured victims had taken treatment at a private clinic. In fact, as per reports of Halsey[^10], private practitioners treated one third of all injuries, which accounted for under-reporting of injuries. Hospital records are based on the International Classification of Diseases (ICD)-10 coding[^11]. Under this system, it is difficult to categorize injuries as per the dual system of coding i.e. whether it should be included in anatomical type of injury (open wound, fracture, dislocation etc.) or in the cause of injury (traffic, fall, burn etc.) category. Of the injuries reported at two major and six colony hospitals of MCD, only 24% were traffic injuries. It was difficult to trace other traffic injuries recorded among other anatomical groups i.e. fractures, wounds etc. This may be the reason for under-reporting of traffic injuries by the health sector. So the need was felt to modify the ICD-10 reporting system. Of the two parameters i.e. type of injury and cause of injury, one may be used for ascertaining the magnitude and the other for research and planning purposes. In order to assess the severity of the injury, the report must have a separate category of injury like outdoor/ indoor, primary/ secondary/ tertiary-level injuries or type of treatment (ward/ operation/ intensive care). The annual incidence rates for major injuries: 73.1 (31% traffic) and for all injuries: 116.7 (25% traffic) per 1 000 population respectively, as found in this study, are consistent with findings of other community-based studies, such as 93 (29% traffic) by Pramod[^12]; 115 (5.7% traffic) by Gordon[^13], and 311 by Rahman[^14]. This difference in incidence may well be due to the use of author's own definition of injury based on criteria of inclusion and exclusion of different types of severity. It was found that injuries were more common among those in the young and productive age group; other studies also showed the same pattern.[^15,16] As more traffic injuries were reported during the evening time, legal measures could be strengthened during those hours. Even though roadside fatality is the highest in India as compared to other countries, there is no planning for road safety[^17]. As mentioned in various ad hoc studies and some of the WHO technical reports along with present study data, there is an urgent need of planning for injury prevention in developing countries.[^18,19,20,21]
References

7. The Central Road Research Institute Report, Road User Cost Study in India, New Delhi, 1982.
21. Transport and Road Research Laboratory, Towards Safe Roads in Developing Countries: A Guide for Planners and Engineers, Crowthorne Berkshire UK.
Epidemiological Study of Road Traffic Accident Cases: A Study from Eastern Nepal

By Nilambar Jha*, Chandra Shekhar Agrawal**

Abstract

The reasons for the high burden of road traffic injuries in developing countries are: growth in the numbers of motor vehicles; higher number of people killed or injured per crash in low-income countries, poor enforcement of traffic safety regulations; inadequacy of health infrastructure, and poor access to health care. In Nepal as per estimates of morbidity and mortality for 1998-1999, injury contributed 9% to total mortality and was the third leading cause, with road accidents occupying the eighth position in the overall ranking. Fifty eight per cent of the injuries occurred in the 15-44 years age group with the male to female ratio of 3:1.

This one-year study was conducted in two hospitals of eastern Nepal. A total of 870 road traffic accidents (RTAs) victims were reported during the one-year study period. The highest (28.6%) percentage of these cases were in the age group of 20-29 years. The labourers constituted the largest group (27.6%) involved in RTAs, followed by students (24.1%). The highest number (126, 14.5%) of RTA victims were reported in the month of July followed by January. The highest number of accidents occurred on Sundays (30.5%) and Fridays (20.0%) respectively. In the present study, 16.9% drivers were found to have consumed alcohol 2-3 hours prior to the accident. Buses (31.4%), trucks (12.3%) and bicycles (11.3%) were the common vehicles involved in RTAs.

There is lack of coordination between different ministries, departments and other agencies working in the field of injury including road traffic injury. Therefore, there is a need for the Ministry of Health to take the lead and coordinate the efforts of all agencies working for the prevention and control of road traffic injuries.

* Additional Professor, Department of Community Medicine, BP Koirala Institute of Health Sciences, Dharan, Nepal
** Professor and Head, Department of Surgery, BP Koirala Institute of Health Sciences, Dharan, Nepal
Introduction

Member countries of the South-East Asia Region have been passing through a major epidemiological transition, socio-demographic changes and technology revolution during the past two decades. Countries are passing through significant urbanization, motorization, industrialization and changes in the socio-economic values of societies. Injuries on roads, at homes, and in the workplace have increased due to lack of safety-related policies and programmes. The health sector in these countries bears the maximum brunt in terms of provision of acute care, and short-term and long-term rehabilitation service. (1)

In 2000 an estimated 5.1 million people died due to injuries worldwide, accounting for 10% of deaths due to all causes. It is estimated that more than a quarter of injury-related deaths in the world occurred in the South-East Asia Region in 2000. Children saved today from nutritional and infectious diseases are killed and maimed by injuries in hundreds of thousands tomorrow. In fact, road traffic injuries alone ranked as the number one cause of the burden of disease among children between 5-14 years, and as the number three cause among those in the age group 15 to 29 years in 2000. This heavy burden at such an early age has long-term implications on the quality of life and economy of the nations. (2)

As per the Annual Report of the Department of Health Services Nepal, falls, burns and scalds, and dog bites were reported in large numbers. Injuries comprised 2% of hospital admissions, occupying the ninth leading position. They also accounted for nearly 60-70% of emergency room registrations at the Bir Hospital (an apex hospital in the country). Road traffic accident injuries were the principal (80 to 90%) cause of injuries. (1)

In Nepal as per estimates of morbidity and mortality for 1998-1999, injury contributed 9% to total mortality and was the third leading cause, with road accidents occupying the eighth position in the overall ranking. Fifty eight per cent of injuries were in the 15-44 years age group with a male to female ratio of 3:1. (3)

Road traffic injuries in developing counties mostly affect pedestrians, passengers and cyclists as opposed to drivers who are involved in most of the deaths and disabilities occurring in the developed world. (4) The reasons for the high burden of road traffic injuries in developing countries are: growth in the numbers of motor vehicles; higher number of people killed or injured per crash in low-income countries; poor enforcement of traffic safety regulations; inadequacy of health infrastructure, and poor access to health care. (4)

Methodology

This study was conducted at the Sunsari District Hospital (SDH) Ineruwa and the B.P. Koirala Institute of Health Sciences (BPKIHS) Hospital, Dharan. The study period was from May 1997 to April 1998. The study group consisted of all the road traffic accident victims reporting to these two hospitals of Sunsari district during the above-mentioned one-year period. For the purpose of the study, an RTA was defined as an accident...
which took place on the road between two or more objects, one of which had to be any kind of a moving vehicle. Any injury on the road without involvement of a vehicle (e.g. a person slipping and falling on the road and sustaining injury) or injury involving a stationary vehicle (e.g. person getting injured while washing or loading a vehicle) were excluded from the study.

The victims of the accidents were interviewed to obtain information about the circumstances leading to the accident. A pre-tested proforma especially designed for this purpose was used for interviewing the accident victims, either during the emergency or in the wards of the SDH and BPKIHS hospitals; where the condition of the victims did not warrant the interview, the relatives or attendants were interviewed.

The information collected comprised: personal identification data; time data; day; type of vehicle involved in RTA; protective gear worn, and the category of road users. In addition, the type and severity of injury suffered by the victims and their management were also recorded. The medico-legal records and case sheets of the victims were referred for collecting additional data and where necessary for cross-checking.

**Results**

A total of 870 RTA victims reported at both hospitals during the period: May 1997 to April 1998. Out of these, 366 cases were registered at SDH and 504 cases at BPKIHS, Dharan. There were 662 (76.1%) male and 208 (23.9%) female casualties (Table 1).

**Table 1. Age and sex distribution of Road Traffic Accident (RTA) victims in Eastern Nepal, 1997-1998**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Males</th>
<th></th>
<th>Females</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>0 - 9</td>
<td>89</td>
<td>13.4</td>
<td>46</td>
<td>22.1</td>
<td>135</td>
</tr>
<tr>
<td>10 - 19</td>
<td>116</td>
<td>17.5</td>
<td>33</td>
<td>15.9</td>
<td>149</td>
</tr>
<tr>
<td>20 - 29</td>
<td>202</td>
<td>30.5</td>
<td>47</td>
<td>22.6</td>
<td>249</td>
</tr>
<tr>
<td>30 - 39</td>
<td>130</td>
<td>19.6</td>
<td>34</td>
<td>16.3</td>
<td>164</td>
</tr>
<tr>
<td>40 - 49</td>
<td>69</td>
<td>10.4</td>
<td>17</td>
<td>8.2</td>
<td>86</td>
</tr>
<tr>
<td>50 - 59</td>
<td>34</td>
<td>5.1</td>
<td>16</td>
<td>7.7</td>
<td>50</td>
</tr>
<tr>
<td>60 - 69</td>
<td>14</td>
<td>2.1</td>
<td>12</td>
<td>5.8</td>
<td>26</td>
</tr>
<tr>
<td>70 and above</td>
<td>8</td>
<td>1.2</td>
<td>3</td>
<td>1.4</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>662</td>
<td>100.0</td>
<td>208</td>
<td>100.0</td>
<td>870</td>
</tr>
</tbody>
</table>

Source: Hospital-based study

The highest number of victims (249, 28.6%) were from 20-29 years of age followed by 164 (18.9%) in the age group 30-39 years. More than 80% of victims (697) were under 40 years of age. Table 2 describes the educational status and occupation of the RTA victims.

**Table 2. Educational status and occupations of RTA victims, Eastern Nepal, 1997-1998**

<table>
<thead>
<tr>
<th>Education</th>
<th>Frequency</th>
<th>Occupation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Illiterate</td>
<td>195</td>
<td>22.4</td>
<td>Labourer</td>
</tr>
<tr>
<td>Primary School</td>
<td>199</td>
<td>22.9</td>
<td>Student</td>
</tr>
<tr>
<td>High School</td>
<td>177</td>
<td>20.3</td>
<td>Housewife</td>
</tr>
<tr>
<td>Matriculate</td>
<td>104</td>
<td>12.0</td>
<td>Agriculturist</td>
</tr>
<tr>
<td>Intermediate</td>
<td>155</td>
<td>17.8</td>
<td>Govt. Service Employee</td>
</tr>
<tr>
<td>Graduate and above</td>
<td>18</td>
<td>2.1</td>
<td>Government Employee</td>
</tr>
<tr>
<td>Not applicable</td>
<td>22</td>
<td>2.5</td>
<td>Unemployed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Businessman</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Others</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>100.0</td>
<td>Total</td>
</tr>
</tbody>
</table>
Almost an equal percentage (23%) of victims were either illiterate or had had only primary-level education. Victims with a higher education were fewer in proportion. There were 240 (27.6%) students involved in RTA. This was followed by agriculturists (18.7%). The maximum number (126, 14.5%) of RTA cases reported in the month of July followed by January (Figure. 1).

A greater number of accident cases (37%) were registered in three rainy months of July, August and September, and also in winter months (33.5%). The highest number 265 (30.5%) of victims was reported on Sundays followed by Fridays. The categories of road users involved in these accidents were occupants of different vehicles (46%), drivers (24.4%) and pedestrians (29.6%).

Among the drivers of different types of vehicles, 80 (37.7%) were bicyclists, followed by 70 (33%) motorcyclists (Table 3).

Table 3. Different types of drivers, occupants and vehicles involved in RTA, Eastern Nepal, 1997-1998

<table>
<thead>
<tr>
<th>Type of vehicle</th>
<th>Drivers No.</th>
<th>Drivers %</th>
<th>Occupants No.</th>
<th>Occupants %</th>
<th>Vehicles No.</th>
<th>Vehicles %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle</td>
<td>80</td>
<td>37.7</td>
<td>34</td>
<td>8.5</td>
<td>104</td>
<td>11.2</td>
</tr>
<tr>
<td>Two-wheelers</td>
<td>70</td>
<td>33.0</td>
<td>55</td>
<td>13.8</td>
<td>237</td>
<td>25.6</td>
</tr>
<tr>
<td>Three-wheelers</td>
<td>6</td>
<td>2.8</td>
<td>6</td>
<td>1.5</td>
<td>71</td>
<td>7.7</td>
</tr>
<tr>
<td>Car, Jeep, Van</td>
<td>18</td>
<td>8.5</td>
<td>35</td>
<td>8.8</td>
<td>100</td>
<td>10.8</td>
</tr>
<tr>
<td>Bus</td>
<td>25</td>
<td>11.8</td>
<td>200</td>
<td>50.0</td>
<td>290</td>
<td>31.4</td>
</tr>
<tr>
<td>Truck</td>
<td>4</td>
<td>1.9</td>
<td>61</td>
<td>15.2</td>
<td>114</td>
<td>12.3</td>
</tr>
<tr>
<td>Bullock cart</td>
<td>9</td>
<td>4.3</td>
<td>9</td>
<td>2.2</td>
<td>9</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100.0</td>
<td>400</td>
<td>100.0</td>
<td>925</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 1. No. of RTA cases in different months, Eastern Nepal, 1997-1998

Source: Hospital-based study
Of the 212 drivers involved in RTAs, 80 were bicyclists and nine were bullock cart drivers, who do not require a driving license. The remaining 123 drivers had a valid driving license. All the motorized two-wheeler drivers (70) used protective helmets during RTAs. No seat belts were found to have been used by the car, jeep and van drivers and the occupants. Out of 212 drivers, 36 (16.9%) were found to have consumed alcohol 2–3 hours prior to the accident. These included 18 (50%) bicyclists, 10 (27.8%) motorized two wheelers, six (16.7%) bullock cart drivers and six (5.5%) truck drivers. Among the occupants of buses, 200 (50%) comprised the highest number of victims involved in RTAs followed by 61 occupants of trucks (15.2%). Since RTA usually involve more than one vehicle, the total number of vehicles involved were 925. Of these, 290 (31.4%) were buses, 225 (24.3%) were motorcycles and 114 (12.3%) were trucks. Falling down was the more common mode of accident claiming 322 victims (37%), followed by the knocked-down category (Fig. 2). A total of 89 (10.2%) animals; 40 (4.6%) trees and 31 (3.6%) electric poles were also involved in 160 (18.4%) RTAs.

Discussion

Crude estimates suggest that the annual cost of road crashes is about 1% of the Gross National Product (GNP) in developing countries, 1.5 in transitional countries and 2% in highly motorized countries. The global estimate of US$ 518 billion was produced by Transport Research Laboratories.\(^5\)

Although limited information is available in health research and development on motor vehicle safety it is safe to say that the lack of such investment contributes to the growing seriousness of the problem and the widening gap between the low- and middle-income countries, and the high-income countries. In fact, the economic data show that only US$ 1 was spent for every Disability Adjusted Life Year (DALY) caused by road traffic collisions in 1990 despite the fact that projections indicate that road traffic collisions will be the third biggest cause of DALY by the year 2000.\(^6\)

Eight hundred and seventy RTI cases were reported from two hospitals in Sunsari district of eastern Nepal (Table 1).

The highest (28.6%) percentage of these were cases in the age group of 20–29 years. Similar findings were observed in other studies.\(^7\) A higher number of cases in this age group can probably be explained on the basis that this is the most active period of life during which there is a tendency to take risk. It was observed that 57.4% of victims were in the age group of 20 to 49 years. This shows that people from the most active and productive age groups are more involved in RTAs. This causes a serious economic loss to
the community. Similar observations were also made in other studies.\textsuperscript{(7,10,11)}

It was noticed that below and above the age of 20 and 49 years respectively, there is a decrease in accident cases. The reason for this may be that children are taken care of by elders and are less likely to use vehicles. The lower proportion of RTAs in those aged 60 years and above could be due to the generally less mobility of these population groups. The male/female ratio observed in this study was 3.2:1. The predominance of males was also observed by many authors.\textsuperscript{(7,8,12,13)} This may be due to the fact that females lead a less active life and mostly remain indoors.

Furthermore, it was observed that more people with lower levels of education were involved in RTAs (Table 2).

Similar results were also observed by others.\textsuperscript{(8,14)} However this relationship between education and RTA may not be causal. In this study, labourers constituted the largest group (27.6%) involved in RTAs, followed by students (24.1%). One study\textsuperscript{(14)} has also reported that more accidents were seen in the low economic group of people whereas another study\textsuperscript{(8)} has reported the students group to be the highest, followed by labourers. The reason for this may be that labourers travel in trucks carrying bricks, sand, heavy materials and other goods, which are usually loaded in an improper manner. It is interesting to note that among the type of motorized vehicles, trucks were involved in a large number of accidents, and labourers often travelled in trucks as part of their work.

The highest number (126, 14.5%) of RTA victims who reported to these hospitals was recorded in the month of July followed by January (Fig. 1). A possible reason for this could be the increased number of accidents in these months, due to rains in July and fog in January. More accidents were observed in rainy months like August (11.7%), and September (10.8%), and in winter months like December (11.0%). A similar observation was also reported by others.\textsuperscript{(7,8,9)}

In the present study, the highest number of reported accident cases occurred on Sundays (30.5%) and Fridays (20.0%). In Nepal, Sundays and Fridays are the first and last working days of the week: this could be the possible reason for the large number of accidents on these days. People celebrate Friday as weekend and possibly are in a hurry to go to various places to join their working places on the following Sunday. Ghosh\textsuperscript{(9)} also observed the highest number of RTAs on the first working day i.e. Monday in India. Mehta\textsuperscript{(8)} and Stallones\textsuperscript{(15)} observed more accident cases on a weekend Saturday. These observations are similar to those of the present study. Accidents were reported on Mondays (10.9%), Tuesdays (12.3%), Wednesdays (11.6%), Thursdays (11.0%) and Saturdays (3.7%). The number of accidents was the lowest on Saturdays. The possible reason for this could be that Saturdays are a weekly holiday in Nepal. The other reason could be that Nepalese do not like to start their journey on a Saturday because of a religious belief.

In this study the pedestrians constituted 29.6% of the main road users involved in RTA, followed by bicyclists (37.7%) and two-wheeler drivers (33.0%) among the drivers category. Similar results were also observed.
by others. Bus drivers (11.8%) were observed to be involved in RTA in large numbers: a possible reason for this could be that buses are the most common mode of transportation used by people. This is reflected by the fact that bus occupants constituted the highest number 200 (50%) of RTA victims.

In the present study 16.9% drivers were found to have consumed alcohol 2-3 hours prior to the accident. This is a higher proportion than 4.6%, 8% and 14.9% reported respectively by others. The role of alcohol in impairing driving ability is well documented. Also the impairment increases as the blood alcohol level rises. In addition, the risk of accidents is higher in youngsters and elderly people for similar blood alcohol levels.

Buses (31.4%), trucks (12.3%) and bicycles (11.3%) were vehicles commonly involved in RTAs. More or less similar observations were reported by others from India. Among the motorized vehicles, buses and trucks were involved in RTAs the most. Rough driving, over-speeding and heavily-loaded vehicles offering poor control were the possible reasons for the vehicles involvement in RTAs. The common (37%) mode of sustaining accidents was by falling down from a moving vehicle (Fig. 2). But Ghosh reported getting knocked down by a vehicle as the common mode of accidents in Delhi.

Conclusion

Nepal has comprehensive safety plans for tackling traffic problems, but they are under-funded and poorly coordinated. Ministries, donors, and business and nongovernmental organizations are actively interested in road safety issues, but all this has not yet translated into a cohesive strategy or into a set of well-coordinated actions. Moreover, there are gaps in the proposed national traffic safety action plans, which lack clear priorities based on a strategic analysis of the situation. Alcohol for example, appears to be a larger problem than is officially acknowledged throughout Nepal. Yet there are virtually no countermeasures such as public education, and anti-drunken driving campaigns, nor even the legal ability to deter drunk drivers. Worldwide experience has shown that tough but fair and targeted enforcement of measures against unsafe behaviours, along with mass behaviour modification and education are crucial to the rapid improvement of road safety. Regrettably, enforcement is not a high enough priority in Nepal. At the same time the implementation of all aspects of any road safety plans are ultimately necessary. But the more pressing reality is that current allocations for road safety are inadequate and allocations for educational programmes are even more deficient.

The national policy for injury prevention and control in Nepal is in its final stage. However, there are big challenges ahead for the implementation of such policy throughout the country in an effective manner. There is lack of coordination between different ministries, departments and various agencies working in the field of injury including road traffic injury. The data are kept separately and not shared for developing immediate and future plans. Therefore, there is a need for the Ministry of Health to take the lead and coordinate the efforts of all agencies working for the prevention and control of road traffic injuries, and also in road safety.
References


Road Fatalities in Sri Lanka: 1980 to 2000

By

Samath D Dharmaratne*, Mark Stevenson**

Abstract

Almost three quarters (70%) of road fatalities around the world occur in low-income countries with 65% of the injuries involving pedestrians. This research analysed traffic police data for road traffic fatalities in Sri Lanka for the period 1980 to 2000. The fatality rate per 100,000 population increased by 55% during this period to reach 11.6 per 100,000 population in the year 2000. The fatality rate for pedestrians remained relatively constant with a fatality rate of 4.4 per 100,000 population recorded in the year 2000. However, pedestrian fatalities, as a proportion of the total fatalities, decreased from 51% in 1980 to 40% in the year 2000. In contrast, driver fatalities, as a proportion of the total fatalities, increased during the period. These changes highlight the transition Sri Lanka is undergoing, from a low to high-motorized nation. Highlighting the importance of this emerging public health problem in Sri Lanka, as well as the introduction of successful interventions from high-income countries, are of utmost importance if Sri Lanka is to halt this growing burden.

Introduction

Every year, more than 1.2 million people die in road crashes around the world and almost three quarters of these deaths (70%) occur in low-income countries[1]. Globally, 65% of road fatalities involve pedestrians reflecting the preponderance of road fatalities in low-income countries, where few vehicle occupants are involved as compared with pedestrians, motorcyclists, bicyclists and non-motorized vehicle occupants[1]. In low-income countries an estimated six million road users will die and a further 60 million will be injured from road crashes over the next 10 years unless urgent action is taken[1]. It is estimated that by 2020, road traffic injuries will account for approximately 2.3 million deaths globally, with over 90% of them occurring in low-and middle-income countries[2]. The global burden of disease due to road traffic injuries is expected to move from the ninth position in 1990 to the

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third position by 2020 [3]. It is also estimated that if low-and middle-income countries do not act immediately, up to 1% of a country’s gross domestic product will be neutralized by road traffic injuries [4].

Although the incidence of road traffic fatalities has reduced significantly in high-income countries over the past three decades, there has been no reduction in low-income countries; particularly in countries of the South-East Asia Region [5]. Sri Lanka, a low-income country in the Region, is facing a growing burden of road traffic injury due to exponential growth in motorization. Although several government publications have highlighted the burden from road traffic injuries [6-8], there has been no progress towards addressing this epidemic. The lack of interest in road traffic injury prevention has been attributed, in part, to the economic situation, namely the lack of government resources to invest in road safety.

This paper describes the epidemiology of road traffic injuries in Sri Lanka for the period 1980 to 2000, in order to highlight the burden of the public health problem in Sri Lanka.

Methods

In Sri Lanka, the Statistics Division of the Police Headquarters has been responsible for the collection, compilation, analysis and publication of road crash statistics for the country, and it provides the most comprehensive database on road crashes in Sri Lanka [9].

The law requires that all road traffic crashes be reported to the police within 24 hours (Abeywardena, M. 1998, pers. comm., Jan). A road traffic crash is defined as a crash occurring on a public highway/road involving a vehicle and involving personal injury or property damage. In Sri Lanka, road traffic crashes are classified into fatal, grievous, non-grievous and damage-only crashes. A fatal road traffic crash is defined as a crash where a victim dies due to injuries sustained in the road traffic crash irrespective of the time interval between the time of the crash and death [9].

All road traffic fatalities reported to the police in Sri Lanka during the period 1980-2000 were included in the study. Data were retrieved manually from the Statistics Division records, and entered into an Excel 2000 spreadsheet for analysis. The total population of Sri Lanka and the number of registered motor vehicles for the study period were obtained from the Department of Census and Statistics [10].

The road crash fatality rate was calculated by dividing the police-reported fatalities by the population for each respective year. The percentage fatalities for each road user category were estimated using the category-specific fatalities and the total road fatalities. The denominator for the category-specific fatality rates for motorcyclists and drivers were the number of registered motorcycles and the number of registered motor vehicles (excluding motorcycles) respectively.

Results

Road fatalities have been increasing in Sri Lanka over the past two decades from 7.5 per 100 000 population in 1980 to 11.6 per
100,000 population in the year 2000; a 55% increase over the period (see Figure 1). Overall, there has been an increasing trend, although a decline was evident in 1987 and again in 1993. During the same period the number of registered motor vehicles increased by four-fold and the population of Sri Lanka by 25% to reach 1,706,074 registered motor vehicles and 18,467,000 people, respectively (see Table 1).

Table 1. Fatalities, registered motor vehicles and population of Sri Lanka from 1980 to 2000

<table>
<thead>
<tr>
<th>Year</th>
<th>Fatalities</th>
<th>Registered vehicles</th>
<th>Population ('000)</th>
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<tr>
<td>1980</td>
<td>1,106</td>
<td>337,382</td>
<td>14,738</td>
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<tr>
<td>1981</td>
<td>1,247</td>
<td>374,110</td>
<td>14,988</td>
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<tr>
<td>1982</td>
<td>1,257</td>
<td>403,014</td>
<td>15,189</td>
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<tr>
<td>1983</td>
<td>1,375</td>
<td>439,661</td>
<td>15,416</td>
</tr>
<tr>
<td>1984</td>
<td>1,310</td>
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<tr>
<td>2000</td>
<td>2,150</td>
<td>1,706,074</td>
<td>18,467</td>
</tr>
</tbody>
</table>

Pedestrians, as a road user group, were overrepresented in road fatalities. They comprised 51% of all road fatalities in 1980, but were reduced to 40% by 2000 (see Figure 2). However, the pedestrian fatality rate increased from 3.8 per 100,000 population in 1980 to 4.4 per 100,000 population in the year 2000.

Passenger-related road fatalities remained fairly constant during the study period; being 22% and 23% of the total road user deaths in 1980 and 2000, respectively (see Figure 2). The passenger fatality rate increased from 1.6 per 100,000 population in 1980 to 2.5 per 100,000 population in 2000.

The pedal-cyclist fatalities contributed 10% of the total fatalities in 1980 and 15% in 2000 (see Figure 2), while the fatality rate increased from 0.8 per 100,000 population in 1980 to 1.6 per 100,000 population by 2000. In contrast, the motorcyclist fatalities remained relatively constant, being 10% in 1980 and 11% in 2000, but the fatality rate reduced drastically from 14.3 per 10,000 registered motorcycles in 1980 to 3.0 per 10,000 registered motorcycles by 2000.
Fatalities to the driver as a proportion of all road fatalities, increased during the period of study. Driver fatalities almost doubled (as a percentage of all road fatalities) from 6% to 11% over the twenty-year period (see Figure 2). However, the fatality rate per 10,000 registered motor vehicles remained relatively constant (around 2.6 per 10,000 registered motor vehicles) during the period.

Discussion

Overall, the road fatality rate has increased in Sri Lanka by approximately 55% over the period of the study. The increase can be explained in part by the open economic policy adopted by the government in 1978. Since the introduction of the policy, there has been exponential growth in the importation of motor vehicles with limited investment in the road infrastructure, while only a few comprehensive road safety strategies have been formulated.

Over the study period, pedestrian fatalities have decreased, as a proportion of total fatalities, while driver fatalities have increased. Interestingly, although passenger fatalities did not change markedly during the study period, passengers remained the second largest road user group contributing...
one fifth of the total road fatalities. This finding is not surprising as Sri Lanka is transitioning through a period of low to high motorization [11]. The transition is reflected by the pedestrian fatality rates reducing, and the driver fatality rates increasing.

In this study, the pedal-cyclist and motorcyclist fatality rates present contrasting pictures. While the pedal-cyclist fatalities, as a proportion of the total fatalities, increased; from 10% to 15%, the fatality rate per 100,000 population doubled during the study period. In contrast, the motorcyclist fatality rate per 10,000 registered motorcycles reduced substantially. This finding is more likely to reflect the large increase in the number of motorcycles imported into the country during the study period, rather than any strategy targeting motorcycle safety.

Overall, Sri Lanka lost 32,302 lives on the roads over the study period that equated to 1,538 lives a year. Given that the official statistics are likely to be under-reported by as much as 25% [12], this is an immense human loss to a low-income country such as Sri Lanka; particularly since 40% of fatalities involve road users who are younger than 25 years of age [13]. Also important is the economic loss associated with road fatalities. Each fatal road crash is estimated to cost Sri Lankan Rupees (Rs) 181,553 (US$ 1,912) [13], that is approximately sixty times the monthly per capita income of Rs 3,141 (US$ 33) [14].

The study relied on traffic police data; and the under-reporting inherent in this source has been reported, as alluded to above, to be as high as 25% [12]. This limitation alone highlights the fact that the estimates reported in this paper are likely to under-estimate the extent of the problem. It is a matter of urgency therefore, that a low-income country such as Sri Lanka, places road safety on its agenda and examines interventions from high-income countries that may be appropriate for immediate implementation, in order to check this growing public health burden.

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References


Strengthening the Care of the Injured: The Essential Trauma Care Project – Relevance in South-East Asia

By
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Abstract
Road traffic accidents and other forms of injury are an increasing health problem globally and especially in the South-East Asia (SEA) Region of WHO. Much can be done to address this problem by increased attention to road safety and other forms of injury prevention. Gains can also be made by strengthening the care of the injured. Currently, there are significant discrepancies in outcomes of injured patients between countries at different economic levels. Part of this discrepancy is obviously due to differences in economic resources. Nonetheless, the survival and functional outcomes for injured patients in low and middle income countries (LMICs) could be improved by addressing the potential “weak links” in human resources (training and staffing) and physical resources (equipment and supplies) available for the care of the injured. Much of this could be done in a low-cost, sustainable fashion by strengthening the organization of trauma care services. The Essential Trauma Care Project seeks to assist with such improved organization, by providing a flexible template of “essential” and “desirable” resources that are recommended to be in place in countries globally. The project is a collaborative effort of WHO and the International Society of Surgery and other stakeholders in many countries. This article reviews the development of the project’s main publication, Guidelines for Essential Trauma Care, and summarizes initial efforts at implementation in several countries. The organizers of this project look forward to working with those involved in planning or providing trauma care services in countries of the SEA Region, and to having their advice and input.

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Introduction

Road traffic injury is an increasing health problem globally and especially in the SEA Region. It is a leading cause of death and disability among older children and working aged adults. Much needs to be done to promote road safety and other forms of injury prevention. In addition, many lives could be saved and disabilities prevented by low-cost improvements in the care of injured persons.

In any discussion on care of the injured, we must start by acknowledging that every country has many capable doctors, nurses, and other professionals caring for the ill and the injured. However, their ability to utilize their skills is often hampered by lack of adequate resources with which to work. In this article, we will identify what some of these scarce resources are and how they might be improved through an international initiative called the Essential Trauma Care (EsTC) Project. The EsTC Project is a collaborative effort of WHO and the International Society of Surgery, along with stakeholders in many different countries.

This paper will examine some of the discrepancies in trauma patient outcomes globally. The paper will then review the “weak links in the chain” where it might be possible to make low-cost, yet effective improvements to diminish these discrepancies. The paper will next examine the foundations that we have to build on to make such improvements and how the EsTC Project is building on such foundations. Throughout this paper, we will give some examples from work in several countries, including some in the Region and in other LMICs from which it is felt some appropriate lessons might be gleansed.

Discrepancies in Trauma Patient Outcome

In order to assess the impact that improved treatment might have, we examine data from a comparative study that looked at mortality in seriously injured patients (Injury Severity Scores of 9 or more). Mortality rates rose from 35% in high-income Seattle, USA, to 55% in middle-income Monterrey, Mexico, to 63% in low-income Kumasi, Ghana. People in low-income settings were twice as likely to die as those in high-income settings (1). Considering only patients who survive to reach the hospital, a similar study demonstrated a six-fold increase in mortality for patients with injuries of moderate severity (Injury Severity Score of 15–24). These were injuries that were life-threatening, but eminently survivable with appropriate treatment. Mortality in these patients increased from 6% in a high-income country to 36% in a low-income country (2). That is, these persons with serious, but treatable, injuries were six times as likely to die in low-income settings.

We must also consider disability. In most LMICs, there is a preponderance of long-term disability from extremity injuries. Medically speaking, these should be fairly straightforward to treat, in comparison to injuries to the brain or spinal cord, which are more common causes of disability in high-income countries. Hence, much of the disability from extremity injuries should be

* In this paper, the terms injury and trauma are used interchangeably.
eminently preventable with improvements in orthopaedic care and rehabilitation.\(^3\)

For both mortality and disability, there are a large number of “weak links” that could be strengthened in a low-cost fashion.

Weak Links to be Addressed

The potential weak links that need to be addressed fall into the following broad categories:

1. Human Resources. Trauma treatment in high-income countries is usually envisioned as the domain of fully trained surgeons and intensive care unit (ICU) nurses. However, for most of the world, personnel with less formal trauma training are called upon to deliver emergency and often definitive care. For example, the availability of formally trained surgeons varies logarithmically across the world: North America 50 surgeons/100 000 population; Latin America 7/100 000; Asia (LMICs) 1.5-10/100 000 and Africa 0.5/100 000.\(^4\) Clearly, the role of generalists in the treatment of trauma patients increases dramatically. Hence, we must consider not only increase the numbers of surgical and trauma specialists but to also increase the trauma training received by general practitioners, nurses and others. There are weak links that can be addressed for all of these.

For example, a review of the spectrum of facilities providing trauma care in Mexico revealed that large urban centres tended to be well supplied with trained personnel. However, smaller rural hospitals and clinics, including some that had high volumes of trauma cases, tended to have minimal training for trauma care for both nurses and doctors.\(^5\)

A similar review of trauma care capabilities in India revealed that public hospitals, where the majority of trauma patients are treated, usually have the most junior and least experienced personnel (e.g. the casualty medical officer) as the only one responding to major trauma resuscitations and thus being the only health care personnel caring for the most severely injured persons.\(^6\)

2. Physical Resources. A study of 11 hospitals along major highways in Ghana revealed that equipment for trauma care was frighteningly scarce. None of the 11 hospitals had chest tubes, a very low-cost item vitally important for the treatment of life-threatening chest injuries. Likewise, airway obstruction is one of the most frequent causes of medically-preventable deaths in injured patients. Treatment of this does require some skill, but the equipment is low-cost. Yet, only four of the hospitals had equipment for management of airway obstruction. Obviously there are some extremely low-cost items that could improve trauma care significantly. The lack of such equipment is not due to their cost, and could probably be improved through organization and planning.\(^7,8\) Similar findings are reported from even some of the larger hospitals providing trauma care in India.\(^6\)

3. Organization and Administration. Assuring adequate supplies of equipment is obviously one facet of how administration
could be strengthened. Proper utilization of such equipment must also be addressed. Even in urban environments, with reasonable resources, the need for improvement can be seen. For example, a review of trauma admissions in the year 2000 at the main hospital in Kumasi, Ghana found several problems with the process of trauma care:

- Prolonged times to emergency surgery (mean of 12 hours);
- Low utilization of chest tubes, even though they were physically available, and
- Low utilization of blood and fluid resuscitation.

This study indicated the institution of simple, quality improvement programmes as a potential way to address many such problems simultaneously \(^{(9)}\).

Likewise in India, a review of 50 hospitals providing trauma care nationwide revealed that only 36% had protocols for the care of injured patients \(^{(6)}\).

**Examples of Successes to Build On**

We do not want to imply that there are nothing but problems. Indeed, much positive is occurring worldwide. For example, Ali et al. introduced the Advanced Trauma Life Support (ATLS) course widely in Trinidad. The ATLS is a 2-3 day, highly concentrated, continuing medical education (in-service) training course. The authors made sure that all doctors providing trauma care in the main hospital in Trinidad were ATLS-credentialled. They then documented a decrease in mortality from 67% to 34% for the most severely injured group of patients (Injury Severity Score > 15) \(^{(9)}\). A similar course, the National Trauma Management Course, has now been introduced in India and has trained over 2,000 doctors in the last few years \(^{(6)}\).

**How to Make More Progress Globally**

Many involved in trauma care in countries of the SEA Region are likely to experience similar success stories. The question then is how to make more progress in a comprehensive, organized fashion, and how to do this on a global scale? The Essential Trauma Care (EsTC) Project is seeking to do this and in so doing, is seeking to build on two existing foundations. Even though both of these foundations have very different perspectives, they have successfully attacked major health problems through better organization and planning.

**Essential Health Services:** One foundation is the experience in the field of international health in programmes for essential health services. These are services that are low-cost and high-yield, which address major health problems, and which realistically could be made available to almost everyone in a given population. Programmes involving such services have included defining and promoting these services, and providing technical input to countries or high-need areas to improve their capacity to deliver such services. Examples include: the Essential Drugs Programme, the Expanded Programme on Immunization, the Global TB Programme, and on a more surgical note, the Safe Motherhood Initiative \(^{(11)}\). The latter seeks to promote low-cost
improvements in emergency obstetrical care, worldwide. A similar essential services approach has not been used for trauma care, and it is time to do so!

**Trauma system organization**. The other foundation to build on is the trauma system organization undertaken in several countries, thus far, primarily in high-income countries. For example, the American College of Surgeons’ “Optimal Resources for Care of the Injured Patient,” lays out what should be in place for the care of injured patients at hospitals of different sizes as regards clinical services (human resources), equipment (physical resources) and administrative functions, such as quality improvement. Equally important to the existence of such standards is the fact that they are reinforced through hospital inspections (trauma service verification). Trauma system organization also implies planning for pre-hospital emergency medical services (EMS), setting criteria for pre-hospital triage, and establishing relationships between hospitals in the form of transfer agreements and protocols.

Several studies have shown that areas that improve their organization of trauma services benefit from lowered mortality. All deaths in hospitalized trauma patients decrease by 15-20%. Medically preventable deaths, those from causes that we know how to treat well, such as airway obstruction and isolated ruptured spleens, usually decrease by 50% with a well-organized trauma system. Such improvements are usually accomplished at a fairly minimal cost in comparison to the cost of the existing system itself.

**The Essential Trauma Care Project**

The EsTC Project is a collaborative endeavour of WHO and the International Society of Surgery. It seeks to combine the perspectives of the two above-noted approaches: the public health world of international health and the clinical world of trauma systems. The EsTC Project represents an effort to set minimal, reasonable, and affordable standards for trauma care worldwide. It also seeks to define the resources necessary to ensure the availability of such services for almost every injured person. Finally, it seeks to set in motion efforts to promote the organization and planning necessary to actually accomplish this in every country. We would like to review some of the ongoing work in this international project and how it might be applicable in countries of the Region.

This project has involved the Injuries and Violence Prevention Department (VIP) of WHO and the International Association for Trauma and Surgical Intensive Care (IATsIC), an integrated society within the broader International Society of Surgery. The collaborative Working Group for Essential Trauma Care includes representatives of both organizations as well as trauma care clinicians from about 12 countries, including at least one from each of the Americas, Europe, Africa and Asia. This group has laid out a set of core “essential trauma care services” that it feels can reasonably be assured to virtually every injured person in the world (Table 1). Although these might

*The term “trauma system” implies all that a given country or area has in place for the treatment of injured persons, including pre-hospital and facility-based care.
seem simplistic, there is a good reason for laying them out concretely. That is because a very large percentage of all injured patients worldwide do not receive these services. We feel that they can and should.

Table 1. List of core services

This section contains a list of those services that the authors feel are “essential” to prevent death and disability in injured patients. These can be categorized into three broad sets of core services:

1. Life threatening injuries are appropriately treated, according to appropriate priorities and in a timely fashion, to maximize the likelihood of survival.
2. Potentially disabling injuries are treated appropriately so as to minimize functional impairment and to maximize the return to independent and participating community life.
3. Pain and psychological suffering are minimized.

Within these three broad categories, there are several specific medical goals that are eminently achievable within the resources available in most countries. These are:

1. Obstructed airways are opened and maintained before hypoxia leads to death or permanent disability.
2. Impaired breathing is supported until the injured person is able to breathe adequately without assistance.
3. Pneumothoraces and hemothoraces are recognized and relieved in a timely fashion.
4. Bleeding (external or internal) is stopped in a timely fashion.
5. Shock is recognized and treated with intravenous fluid replacement before irreversible consequences occur.
6. The consequences of traumatic brain injury are lessened by timely decompression of space occupying lesions and by prevention of secondary brain injury.
7. Intestinal and other abdominal injuries are recognized and repaired in a timely fashion.
8. Potentially disabling extremity injuries are corrected.
9. Potentially unstable spinal cord injuries are recognized and managed appropriately, including early immobilization.
10. The consequences to the individual of injuries which result in physical impairment are minimized by appropriate rehabilitative services.
11. Medications for the above services as well as for the minimization of pain are readily available when needed.

Source: Guidelines for Essential Trauma Care, In Press, WHO.
In order to ensure these essential trauma care services, the Working Group has laid out 260 individual items of clinical skills and physical resources that it feels should be in place in health care facilities around the world. An example of some of these for airway management is laid out in Table 2.

**Table 2.** Sample of essential trauma care resource matrix.
(Example for the skills and equipment for management of airway obstruction in injured patients. Fourteen other matrices have been developed for other aspects of trauma care.)

<table>
<thead>
<tr>
<th>Airway skills</th>
<th>Basic</th>
<th>GP</th>
<th>Specialist</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of airway compromise</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Manual manoeuvres (chin lift, jaw thrust, recovery position, etc.)</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Use of suction</td>
<td>D</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Use of bag valve mask</td>
<td>D</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Endotracheal intubation</td>
<td>D</td>
<td>D</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cricothyroidotomy</td>
<td>D</td>
<td>D</td>
<td>E</td>
<td>E</td>
</tr>
</tbody>
</table>

**Airway equipment**

<table>
<thead>
<tr>
<th></th>
<th>Basic</th>
<th>GP</th>
<th>Specialist</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral airway</td>
<td>D</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Suction device (foot pump powered at least) and associated tubing and catheters</td>
<td>D</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Bag valve mask</td>
<td>D</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Laryngoscope</td>
<td>D</td>
<td>D</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Endotracheal tubes</td>
<td>D</td>
<td>D</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Magill forceps</td>
<td>D</td>
<td>D</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Other advanced airway equipment</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

#Basic: Outpatient clinic, often non-doctor staffed.
GP: General Practitioner-staffed hospitals.
Specialist: Specialist-staffed hospital, usually having a general surgeon and possibly other specialities.
Tertiary: Tertiary care hospitals, often university hospitals; wide range of specialists.
E: Essential; D: Desirable.

Source: Guidelines for Essential Trauma Care, In Press, WHO.

Other similar matrices have been developed for:

- Airway
- Breathing
- Circulation and shock
- Head
- Neck
- Chest
- Burns and wounds
- Rehabilitation
- Pain control and medications
- Diagnosis and monitoring
- Security for health care personnel
- Special considerations for children

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*Regional Health Forum – Volume 8, Number 1, 2004*
Similar tables have been created for the other core essential trauma care services. These delineate what resources should be in place in the range of health care facilities, from small rural clinics, to smaller hospitals (often staffed by general doctors), to larger hospitals (usually with specialists), and to tertiary care facilities. Elements that are designated as “E” for “essential” are those that are most critical and should be affordable and applicable in every country, including very low-income countries whose ministries of health only have US$ 3-4 per capita to spend on health. Items that are “D” for “desirable” are those that add some probability of successful outcome, but are more costly and less of a priority. These would be more applicable for middle-income environments and perhaps for busier trauma hospitals in any setting. Hence, we have attempted to take into account the range of situations found worldwide. The above recommendations are contained in the Guidelines for Essential Trauma Care, due to be released in April, 2004. These Guidelines are intended to be:

1. Part science, representing the consensus of an international panel of experts as to what are the most cost-effective elements of trauma care;

2. Part planning guide for clinicians, hospital administrators, and ministries of health to assist with efforts to better organize and administer individual facilities and trauma systems. It is intended that the Guidelines will be in the form of a template, to be adapted as needed by individual countries, and

3. Part advocacy statement, in that they contain a list of services that WHO and the International Society of Surgery have endorsed as what can and what should be available to every injured person worldwide.

The Guidelines for EsTC also contain recommendations on how the essential and desirable elements might be implemented through training programmes, quality improvement programmes, hospital inspections, and political interactions.

During its development, the document was reviewed by over 40 experts from over 20 countries. This included individual reviewers and experts reviewing as representatives of 15 national and international organizations.

The real proof of the utility of the EsTC Project lies in its being used to actually assist, promote, and catalyze improvements in trauma care in individual countries. It is anticipated that this will be a collaborative process, among ministries of health, country offices of WHO, and professional societies. Thus, the next phase is to undertake pilot projects in individual countries to adapt the model guidelines to their circumstances and to look for ways to promote and establish the guidelines within their systems. The preliminary progress is under way:

(a) Ghana. The Guidelines for EsTC have been endorsed by the Ghana Medical Association, which has recommended them to their Ministry of Health for imple-
Strengthening the Care of the Injured: The Essential Trauma Care Project – Relevance in South-East Asia

mentation. The Ministry has used the Guidelines as the basis for nationwide needs assessment of trauma care capabilities.

(b) Vietnam. The Guidelines for EsTC have been used as the basis for needs assessment of health care facilities in Hanoi area. The Ministry of Health, WHO Country office, the UNICEF Country Office and several nongovernmental organizations have been discussing ways in which to implement essential trauma care in several of Vietnam’s provinces.

(c) Mexico. The Guidelines for EsTC have been endorsed by the Asociación Mexicana de Medicina y Cirugía del Trauma (AMMCT – Mexican Association for the Medicine and Surgery of Trauma). The AMMCT, along with the WHO country office in Mexico and the International Society of Surgery have presided over a representative three-states needs assessment of trauma care. These same stakeholders, along with the national Ministry of Health, are planning a meeting in 2004 to evaluate ways to integrate the criteria within the Guidelines into national health policy.

(d) India – Gujarat state. The state Department of Health and the Gujarat sub-country WHO office co-sponsored a two-day meeting in April 2003, which involved 40 stakeholders in trauma care in the state. These included representatives of the Academy of Traumatology (India), the Indian Orthopaedic Association, faculty members of teaching institutions, and several nongovernmental organizations. The Guidelines for EsTC were adapted for the Gujarat context and working groups established to develop implementation plans. In the adaptation, the four category criteria (Table 2) were adjusted to fit the five-level health care system in that state. Likewise, some of the items that were considered as “desirable” in the WHO-ISS international scheme were upgraded to “essential” in the Gujarat scheme. Such adaptations are the way in which the Guidelines for EsTC are intended to be used. This ongoing work will hopefully provide us with examples of the real-world implementation of this project.

Conclusions

Much can be done to lower the staggering toll from road traffic accidents and other forms of injury. This includes increased attention to road safety and prevention, as well as efforts to strengthen the care of injured patients. Currently, there are significant discrepancies in the outcomes of injured patients between countries at different economic levels. The survival and functional outcomes for injured patients in countries of the SEA Region could be improved by addressing potential “weak links” in human resources (training and staffing) and physical resources (equipment and supplies) available for the care of the injured. Much of this could be done at a low-cost and in a sustainable fashion by strengthening the organization of
trauma care services. The Essential Trauma Care Project seeks to assist with such improved organization, by providing a flexible template of essential and desirable resources that are recommended to be in place in countries globally. This approach has already shown promise in several countries. The organizers of this project look forward to the opportunity of working with those involved in planning, providing or administering trauma care services in countries of the SEA Region, and to having their advice and input.

References


The Road to Road Safety:
Issues and Initiatives in Bangladesh

By
Md. Mazharul Hoque*

Road Accident Problems: The Bangladesh Perspective

Bangladesh and its Road Transport System

Bangladesh is a very densely populated low-lying country with 123 million inhabitants living in an area of 147,570 sq. km i.e. 833 inhabitants per sq. km. Although the land is fertile, the mainly agriculture economy has developed a Gross Domestic Product (GDP) of only US $ 360 per head. Population growth remains high at 1.5% per annum with nearly half of the total population being under 15 in households of average size of 4.8 people. About 20% of the population is living in urban areas and more crucially for transport, this is expected to rise to 30% by the year of 2010. The rate of urbanization in Bangladesh over the last decade has been between 7-8%, a growth which is alarmingly high when compared with other developing countries (e.g. India 4%, Pakistan 5%).

Dhaka, the capital city of Bangladesh, has a population of over 10 million with a growth rate of 8% per annum.

Being a riverine country, road transport plays an important role in Bangladesh. The number of registered motor vehicles on road increased steadily by 62% over the last decade from 3,39,448 in 1990 to 5,51,011 in 2000. The motor vehicle composition on roads is characterized as motorcycles 46%; motor cars 14%; trucks 12%; baby taxis 12%; buses/minibuses 9%, and others 7%. Despite phenomenal growth in the number of motor vehicles the country's transport demand is still predominantly met by non-motorized modes, particularly rickshaws and its level of motorization is far below the levels in other Asian countries. The present number of rickshaws in Bangladesh could be in the order of 800,000. To cater to the growing demand of road transport, the major road network (national highways, regional roads and feeder roads) increased from 14,949 km to 21,174 km in 2000.

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Regional highways form the primary road network of Bangladesh and carry 38% of freight traffic and 60% of passenger traffic with overall modal share of about 60% freight and 70% passengers on road. Although the rates of motor vehicle registration and road kilometrage have grown considerably, they are still considered to be far short of the looming demand. These factors, together with the large shift of traffic from other modes (viz. rail and water) to road, and the process of rapid urbanization in conjunction with socioeconomic parameters, have resulted in enormous road traffic accident problems.

**Total Reported Road Accidents**

Table 1 gives the national trends of police-reported road traffic accidents, fatalities and injuries for the period 1993-2000. It also includes the fatality rate, and the number of deaths per 10,000 motor vehicles on road. It is clear that the number of fatalities has been increasing rapidly, particularly in recent years, from 1,495 in 1993 to 4,046 in 2000, i.e. nearly three times in eight years. Statistics reveal that Bangladesh has one of the highest fatality rates for road accidents – a rate which is higher than 160 deaths per 10,000 motor vehicles on road every year, as compared with the rates of 2.0 in USA and 1.4 in UK. Together with the social impact in terms of pain, grief and suffering, there is a serious economic burden. In current prices, road accidents in Bangladesh are costing the community in the order of Tk. 5,000 crore (at nearly 2% of GDP) per annum. Between 70-80% of accidents occur on highways and rural roads. Pedestrians are involved in about 70% of road accidents.

**Table 1:** Reported road accident trends in Bangladesh (1993-2000)

<table>
<thead>
<tr>
<th>Year</th>
<th>Accidents</th>
<th>Fatalities</th>
<th>Injuries</th>
<th>Total casualties</th>
<th>Fatalities/10000 vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>3140</td>
<td>1495</td>
<td>2409</td>
<td>3904</td>
<td>122.1</td>
</tr>
<tr>
<td>1994</td>
<td>3013</td>
<td>1597</td>
<td>2686</td>
<td>4283</td>
<td>107.1</td>
</tr>
<tr>
<td>1995</td>
<td>3346</td>
<td>1653</td>
<td>2864</td>
<td>4517</td>
<td>110.1</td>
</tr>
<tr>
<td>1996</td>
<td>3727</td>
<td>2041</td>
<td>3301</td>
<td>5342</td>
<td>112.1</td>
</tr>
<tr>
<td>1997</td>
<td>5453</td>
<td>3162</td>
<td>5076</td>
<td>8238</td>
<td>138.2</td>
</tr>
<tr>
<td>1998</td>
<td>4769</td>
<td>3085</td>
<td>3997</td>
<td>7082</td>
<td>128.1</td>
</tr>
<tr>
<td>1999</td>
<td>3942</td>
<td>3314</td>
<td>2620</td>
<td>5934</td>
<td>140.4</td>
</tr>
<tr>
<td>2000</td>
<td>3970</td>
<td>4046</td>
<td>2270</td>
<td>6316</td>
<td>162.9</td>
</tr>
</tbody>
</table>

Source: Bangladesh Police HQ.

**Over-involvement of Trucks and Buses**

Trucks and buses are the major contributors (80%) to road accident fatalities, especially pedestrian fatalities. Besides pedestrians, buses and trucks are most frequently involved in “running-off-road” (and hitting roadside objects), “head-on” and “out-of-control” types of accidents. In terms of vehicle-kilo-meters travelled, motorcycles are much more dangerous than other vehicle types, at least five times the rate for rickshaws. Typically, the principal contributing factors for accidents are: adverse roadside environment; poor detailed designs of junctions and road sections; excessive speeding; overloading; dangerous overtaking; reckless driving; carelessness of road users; failure to obey mandatory traffic regulations; variety of vehicle characteristics, and defects in vehicles. Other factors include:
a low level of awareness on the part of policymakers of the safety problem, inadequate and unsatisfactory education; inadequate safety rules and regulations, and inadequate and unsatisfactory traffic law enforcement and sanctions.

Pedestrians - the Biggest Problem

In urban areas of Bangladesh pedestrians often represent up to 70% of road accident fatalities. Current statistics reveal a deteriorating situation in metropolitan Dhaka. For example, pedestrians as a proportion of road accident deaths increased from 43% in 1986-1987 to 67% in 1991-1992. In recent years (1996-1998) the number of pedestrian casualties (fatalities and injuries) has increased markedly from 443 in 1996 to 588 in 1998, an increase of about 29%. Pedestrians are now making up approximately 63% of road accident fatalities, 32% of injuries and are involved in about 20% of all reported accidents. Indeed, with regard to fatal accidents 70% involved ‘pedestrian-motorized vehicle’ collisions. In rural areas pedestrians account for about 40% highway accidents. The seriousness of a pedestrian accident in Bangladesh is clearly evident from the comparative data of pedestrian involvement in fatal accidents and injuries for numerous countries in Asia-Pacific Region (ADB, 1997). Overall, Hong Kong, China had the highest share of pedestrian deaths (two third of all fatal accidents) followed by Dhaka, Bangladesh (63%), Pakistan (50%), Republic of Korea (48%), Fiji (43%) and Papua-New Guinea (33%) (Hoque, 2000).

Involvement of Children in Road Accidents

The national statistics for road accidents in Bangladesh revealed a serious threat to children. The incidence of overall child involvement in road accident fatalities in Bangladesh is found to be very high, accounting for about 22%. This involvement of children under 15 years of age in road accident fatalities is much higher than those in other developing countries. It is important to note that compared to industrialized countries, the proportion of fatalities to children under 15 years of age in developing countries is approximately two and half times higher.

Of the total child fatalities due to road accidents, nearly 82% were involved as pedestrians with the dominant age group of 5-10 years. Indeed, about one-third of the total pedestrian fatalities are children under the age of 15 years. They are the dominant age group of pedestrian fatalities. The female child pedestrians are disproportionately higher than the male child pedestrians (44.6% vs. 28.9%). The risk to children in the traffic situation is greatly increased today than in the past. Modern technological developments have imposed greater pressure on today’s children to adapt to new situations at home, at school and most of all on our roads.

Road Safety Issues and Constraints in Bangladesh

Increasing Motorization and Urbanization:
The rapid economic growth, increasing disposable income and urbanization are
raising the demands for transportation rapidly in developing countries. As a result, the number of vehicles on roads of developing countries are also increasing rapidly. Developing countries are experiencing an annual growth rate of about 16 to 17%, which is doubling the vehicle fleet in five years and trebling in 10 years. This factor along with the high proportion of two-and three-wheeled motor vehicles in the region and the relatively young age of the majority of the population, are contributing to the serious road accident casualties. These comments are especially relevant to Bangladesh (Hoque, 2001). The present motor vehicle growth rate of around 8% is already causing considerable congestion and safety problems. The road networks have shown their apparent inability to operate efficiently and safely. The future increase to the level of the so-called ‘explosive stage’ is bound to critically worsen the situation and make it unmanageable unless well-coordinated and well-planned systematic approaches are taken at this stage. So, the trend of rapid growth of vehicle population appears to be the major issue in the road accident scenario of Bangladesh.

**Under-reporting of Accidents:** Traditionally, only the police department has been collecting data on road accidents in Bangladesh, and many other developing countries. The widespread under-reporting and incomplete data collection regarding specific details of accidents are, however major problems. This limits the proper analysis of accidents to be carried out towards improving road safety. Loss of lives, personal injury and property damage as a result of road traffic crashes are a common daily phenomenon. No efforts have so far been made to estimate the economic wastage occasioned by traffic crashes in Bangladesh. This failure often limits the understanding of the concerned officials about the safety issues involved in various planning and management-related activities.

**High Fatality Index:** The ‘fatality rates’, i.e. the estimated number of road traffic accident fatalities per 10,000 registered motor vehicles for Bangladesh (over 160) is very high by international standards, as the fatality rates for motorized countries are usually less than two. The ‘fatality index’ (deaths divided by total casualties as a percentage) in Bangladesh is nearly 40%, which is the highest among developing countries. This signifies probably two important characteristics, viz. the widespread under-reporting of less serious accidents and the lower level of emergency medical service available to accident victims. In Bangladesh with the present level of medical services, there is little scope to provide prompt and necessary medical attention to injured people, particularly soon after an accident.

**Institutional Weaknesses:** Road safety improvement efforts in Bangladesh seriously suffer from several serious drawbacks. These are: lack of a strong professional safety agency with adequate executive powers and responsibilities; fragmentation of responsibilities between agencies and insufficient inter-agency coordination; low level of staffing and lack of professional capacity; lack of trained traffic police for effective enforcement and traffic regulations; absence and inadequate dissemination of road safety research, and too few resources directed towards tackling the safety problem etc.
Some Priority Road Safety Options for Bangladesh

Road Safety Strategies and Principles: There are many different strategies for reducing and preventing accidents. It should be realized that road accidents result from failures in the interaction of humans, vehicles and road environment – the elements that comprise the road traffic system. The combination of these various elements to produce road accidents means that road safety itself has to be tackled in a multi-functional manner. An integrated, multidisciplinary approach is required to reduce road accidents and the consequent injuries and economic losses. The principle for achieving a safer road essentially seeks to apply various measures by focusing on five broad strategies (Trinca et al., 1988). These are:

- Exposure control - restrict certain travel and deny access to hazardous situations;
- Accident prevention - the design, construction and maintenance of vehicles and the road system, and traffic control and management devices etc. to manage their operation, have a profound influence on the incidence of traffic accidents;
- Behavioural modification - road user’s education, the law and its enforcement;
- Injury control - vehicle design, roadside hazards management, and
- Post-injury management - recovery, treatment and rehabilitation measures.

It should however be noted that the benefits of road safety strategies and measures can best be achieved by adhering to the fundamental principle of safer operational elements of road designs. Importantly, the main principles of safer road environment are:

- Provide guidance to drivers through unusual sections;
- Provide information to drivers on conditions to be encountered;
- Warn the driver of any sub-standard or unusual features;
- Control the driver’s passage through conflict points or sections, and
- Forgive the driver’s errant or inappropriate behaviour.

Furthermore, some aspects of systematic approach for improving road safety nationally could essentially involve the following:

- Detailed and systematic accident data collection, recording and computerized database development with emphasis on objective information relating to accidents, casualties and the road environment.
- Detailed and sophisticated analysis of accidents with emphasis on sub-categorizing the accidents into location, type, severity, user group etc. The analytical approach should invoke the ‘accident type/location’ technique in ascertaining the incidence of site-clustering of accidents.
• Development of procedures for identification of ‘hazardous road location’/‘accident blackspots’ as the treatment of those locations has been found to be highly cost-effective.

• Understanding and systematic application of proven and effective engineering counter-measures accompanied by proper evaluation studies of their effects.

**Road Safety Engineering:** Road safety engineering may be defined as a process based on the analysis of road and traffic-related accident information and application of engineering principles in order to identify road design and traffic management improvements that will cost-effectively reduce road accidents. The opportunities for road safety engineering in general apply at four levels:

1. Safety-conscious planning of new road networks;
2. Incorporation of safety features in the design of new roads;
3. Improvements in the safety aspects of existing roads to avoid future problems, and
4. Improvement of known hazardous locations on the road network.

These levels can be grouped into two broad strategies of accident prevention and accident reduction. Accident prevention is achieved through the application of safety principles in the provision, improvement and maintenance of roads. Accident reduction is achieved through the application of cost-effective measures on existing roads. Indeed, road safety engineering strategies demand priority consideration as the road environment components remain a major consideration in the overall road safety management strategy. It is argued that real advances in road safety can be best guaranteed - as in the past - through building greater safety into roads and vehicles. With regard to many developing countries in Asia and Bangladesh in particular, there is specific need and much scope for road environment improvement aimed at correcting the most common deficiencies through wider application of traffic and public health approaches.

The safety of vulnerable road users as a matter of priority must be sufficiently catered for in road safety engineering strategies and principles. Vulnerable road users are much more susceptible to accidents when vehicle speeds are high. Thus the most critical and effective measure, which should be immediately adopted, is to limit the speed, particularly in urban areas. This measure alone will greatly reduce the overall number of road deaths as shown by experience all over the world. Among all the necessary prerequisites to the development of cost-effective solutions to accident problems, the most important approach is of course an improved understanding of the accident problem by responsible people, public awareness, and application of the state-of-the-art technologies, etc.

**Application of Road Safety Audit:** Road safety audit is relatively new and highly cost-effective tool for accident prevention. It is applicable both for new projects and exiting roads. An essential element of the audit
The Road to Road Safety: Issues and Initiatives in Bangladesh

process is that it is carried out by independent auditors. A safety audit is carried out at discrete stages of road development projects. It is an iterative process of reviewing roadway design elements and in most cases involves checklists which are vital to the procedures, and where safety skills and judgement are paramount. The application of safety audit principle has considerable potential of rapidly improving the deteriorated safety situation, and could contribute significantly to improving the long-term safety at marginal cost in Bangladesh.

Community-based Road Safety: Substantial opportunities and scope exist for creating a safer road environment through sustained introduction of safe community programmes at the local level by providing wider public participation and awareness, as well as by effecting necessary changes in behaviour and environment. The community itself by virtue of its expertise, enthusiasm, resources and network can greatly enhance the existing programmes and even devise new ways of tackling safety problems. About 30 to 40% of accidents and injuries could be reduced through such programmes, (Svanstrom, 1993; 2002). The opportunities for community road safety cover a wide area, which includes a definition of community road safety and explanation of its role, outline of the programmes, essential structures required for sustained programmes and the other issues viz. good practices, integration of community road safety and other aspects of local government activities, wider communication, and use of the local media.

Intensified Enforcement and Safety Education Measures: It is important to intensify the enforcement and educational programmes to alleviate the problem of road accidents. The current level of traffic law enforcement, vehicular regulations and road users, education is exceedingly low in Bangladesh. It is well recognized that the most important way to reduce the hazard of road accidents is to educate the public and create awareness on how to reduce road accidents. Road safety education, especially for children, is an effective tool for better road user behaviour on roads (ADB, 1997). Public education through community leaders and local officials should be done repeatedly. Voluntary organizations, government/non-governmental organizations should prepare educational films on safe driving, and defensive driving etc. Extensive research on the human factors involved in accidents could contribute significantly in understanding the road user’s behaviour in respect of accidents. Detailed investigation is also necessary to identify the gaps and deficiencies in the perceived traffic safety knowledge of road users, particularly drivers of heavy vehicles.

Institutional and Professional Strengthening: Institutional strengthening and capacity-building of the concerned agencies in the area of road safety is an urgent necessity. Actions regarding road safety would require renewed governmental as well as organizational commitments by setting realistic road safety targets with a programme for developing competent and trained local personnel, safety specialists and researchers to build up indigenous capacity and attain sustainability of effective road
Road Safety

safety programmes. Support, essentially in the form of funding and collaboration, from international agencies and specialized institutes would be particularly important in tackling these problems.

**New and Innovative High-tech Solutions:**
Improved and innovative solutions are also vital to reduce accidents and casualties. Solutions such as safety barriers and crash cushioning (energy absorption system) at increased impact speeds are highly effective in saving human lives. Improved road markings could guide motorists and reduce casualties. Advanced roadside management system (fixed object, trees, poles etc.), and high-tech solutions such as the Intelligent Transport System (ITS) etc. can reduce the overall hazards by a big margin. The ITS is intended to improve navigation systems; assist in safe driving; optimize traffic management; and increase efficiency in road management by building an integrated system of people, roads and vehicles utilizing advanced data communication technologies. While providing users with quick information required for their safe and comfortable travel in ways easy to understand, ITS makes it possible for users to enjoy a high level of transportation system and thus reduce much of the workload commonly associated with driving. In this way, ITS can accomplish a major improvement in road transport safety. Various ITS technologies, such as ‘Advanced Traveler Management System (ATMS)’, ‘Advanced Traveller Information System (ATIS)’, ‘Advanced Rural Transport System (ARTS)’, ‘Advanced Vehicle Control and Safety System (AVCSS)’, and ‘Automated Highway System (AHS)’ etc. can be used for improving road traffic safety. A recent study on ITS application for Bangladesh revealed that with 100% deployment of ITS technology, fatal and injury-related road accidents could be reduced by as much as 26% and 30% (Hasan, 2000).

Organization of Road Safety in Bangladesh

**Road Safety Organizations and Strategic Action Plan**

Indeed road safety action requires the involvement of many different disciplines and the cooperation of a wide range of government, private and civil sectors with a firm governmental/organizational commitment. Recognition of the seriousness of the road accident problem by the Government of Bangladesh is reflected in the various measures taken to combat the alarming situation, (Quazi, 2003). The National Road Safety Council (NRSC) was established in 1995, which drew up the National Road Safety “Strategic Action Plan” covering the period from July 1997 to June 1999. Subsequently, a revised three-year action plan (2002-2004) was prepared in November 2001. Currently there are two core organizations responsible for preparing the national policy on road safety and ensuring its implementation. These are the National Road Safety Council (NRSC) and the Road Safety Cell (RSC). The NRSC acts as the apex body for approving and driving forward the national policy and plans, whereas the RSC established at the Bangladesh Road Transport Authority (BRTA) carries out preparation of plans, coordination, and monitoring and evaluation of planned activities assigned to different agencies and implementation of some programmes assigned to it. Besides NRSC,
the District Road Safety Committees (DRSCs) at the district and metropolitan levels have been formed, which implement programmes and policies of NRSC and are equipped to undertake local road safety programmes according to local needs. The Road Safety Action Plan identified nine priority sector activities for improvement. These are: Planning, management and coordination; Accident data system; Road engineering; Traffic legislation; Traffic enforcement; Driver training and testing; Vehicle safety; Education and publicity; and Medical services. Indeed, the focus activities of the strategic action plan are similar to those covered by the ADB/ESCAP road safety guidelines (ADB, 1997). For the purpose of implementation of the road safety action plan, seven leading agents have been nominated. These are: Roads and Highways Department (RHD); Dhaka City Corporation (DCC); Bangladesh Police; Road Safety Cell (RSC); Bangladesh Road Transport Authority (BRTA); the Ministry of Education and the Ministry of Health. Efforts are under way for strengthening the capabilities of key agencies through a programme of the Institutional Development Component (IDC) funded by DFID (UK). It is increasingly apparent that nongovernmental groups have a key role to play in dealing with road safety problems. The non-governmental organizations (NGOs) are becoming active in the area of road safety in Bangladesh. The activities of two leading NGOs such as BRAC and Centre for Rehabilitation of the Paralysed (CRP) are quite noticeable in this regard, (Quazi, 2003). The major programmes being undertaken include: Community Road Safety; Training of Students; Road Safety Training for Office Staff; Community Road Safety NGO Network; Publicity and Awareness; Research; Driver’s Training; and Treatment and Rehabilitation of Paralysed People.

Establishment of Accident Research Centre

Road safety research provides the framework for making effective policy decisions and for cost-effective investment in road safety. In response to the growing accident problem in Bangladesh, the concerned authorities have started to realize the need for scientific study and research regarding the causes of accidents and commensurate remedial measures. The highest level of commitment in this regard came from the Honourable Prime Minister to establish an independent Accident Research Centre as part of her top priority programmes. The Accident Research Centre (ARC) was established at Bangladesh University of Engineering and Technology (BUET) in 2002 to carry out scientific research for clear understanding of the road safety problems and ascertaining the underlying causative factors which contribute to accidents on roads, railways and waterways. In addition, ARC has major role to develop pragmatic, cost-effective scientific solutions and bring about significant improvements in the capability of professionals and workers in the field of transportation to a meaningful level of expertise for accident prevention and injury control and thereby contribute to a safer environment for all users and operators.

The development objectives of the Centre are to:

- Develop a comprehensive accident and injury database;
- Ascertain the causes of accident and background factors;
Develop countermeasures on the basis of scientific study and engineering knowledge;

Monitor and evaluate accidents countermeasures for accidents;

Assess the economic and social impact of accidents;

Conduct high-quality research on technological, behavioural and educational safety improvement opportunities and their cost-effectiveness;

Provide training and education in accident prevention and safety technology;

Disseminate and share knowledge and translate it into safety policies and practices, and

Foster safety research excellence through exchange and linkage with institutions/organizations at regional and international levels.

The ARC is expected to achieve the following outputs:

- Improved understanding of the accident and injury problem characteristics;
- Development of cost-effective safety measures and techniques;
- Improved capacity for conducting research on traffic accidents and their countermeasures;
- Established programmes for Diploma, Masters and Ph.D. degrees in safety studies, accident control, injury prevention and management;
- Trained safety professionals with knowledge on accidents and safety issues;
- Established facilities for safety education, research and training, and
- Sustained awareness of traffic safety among policy-makers and practitioners.

Apart from consolidating the local safety research, the ARC would develop effective linkages with institutions, organizations and universities at local, regional and international levels to facilitate transfer of knowledge and technologies. The Centre would also initiate professional exchange programme with similar overseas organizations and institutions for updating and sharing of knowledge on matters related to accidents and safety. The Centre through its wide expansion of research work is being driven with the motto of developing a National Accident Research Centre - as a Centre of Excellence for advancement in safety research and training.

Importance of International/Regional Cooperation

The report of the ESCAP/ADB seminar-cum-workshop (ESCAP, 1996) advocates the need for greater international and regional cooperation and assistance in implementing comprehensive action plans through improvements in various sectors/activities outlined in ESCAP/ADB road safety guidelines specifically prepared for developing countries of the Asia-Pacific Region. Support, guidance and advice from organizations like
The Road to Road Safety: Issues and Initiatives in Bangladesh

ESCAP, ADB, WB, GRSP, REAAA and other international aid agencies and specialized institutes could play a vital role in implementing planned series of initiatives in Bangladesh, including strengthening of research activities of the newly-established ARC at the Bangladesh University of Engineering and Technology. Much more efforts are needed in establishing a real network of road safety researchers and centres of excellence in the region for mutual benefits as envisaged in the ESCAP road safety guidelines which detail the various models of regional, sub-regional and technical coordination in specific aspects of road safety (ESCAP, 1996).

An example of a proposed model of such sub-regional coordination among member countries of the ESCAP Region is cited below for better understanding about the mechanism of such coordination.

- Government in each country should identify a responsible agency to maintain contact with ESCAP and the international donor community. Assistance should be sought from experienced practi-tioners to set up the National Road Safety Council (NRSC) in countries where it has not yet been established. Cooperation among countries and on a sub-regional basis should be encouraged.

- One coordinating centre of excellence should be designated in each sub-region where the sub-regional Regional Safety Team (RST) of experts would be located. These would comprise local experts, assisted perhaps by seconded or visiting specialists from the regional centre of excellence.

- Sub-regional working groups should be established by drawing members from national centres of excellence. National centres should, in turn, establish national working groups or work through NRSC, if one exists, to build up local networks of safety experts.

- Regional working group meetings should be held every 12 months, sub-regional working group meetings every six months, and national working group meetings every three months.

Conclusions

The global forecast has indicated that over the next 10 years developing countries like Bangladesh will experience an alarming increase in road accidents and casualties. Addressing the safety problems thus emerges a serious challenge in the absence of requisite transport safety professionals and resources. This paper has highlighted the scale and characteristics of the road safety problem in Bangladesh. It discusses the priority issues and options for improving safety. Pedestrian-vehicle conflicts are clearly the greatest problem with significant involvement of trucks and buses. Children are highly vulnerable in the traffic situation compared with many other countries of the world. There is urgent need and scope for improving the road safety situation by implementing an effective and coordinated safety policy and actions which require significant improvements in relevant sectors viz. better enforcement, better roads.
(including the treatment of accident black spots) and improved public education programmes with the introduction of newly-developed measures and approaches. Intensified efforts are needed to bring about changes in the attitudes of drivers and other users towards safe operations. Importantly, initiatives to improve the conditions would require renewed governmental commitment and considerable resources, particularly trained local personnel, safety specialists and researchers to build up indigenous capacity and attain sustainability of effective road safety programmes. There have been a number of recent governmental initiatives for organizing and implementing road safety programmes through a strategic action plan including the establishment of the Accident Research Centre. These initiatives in tackling the safety problem are considered to be very significant in terms of governmental commitments and are important to regional and sub-regional collaboration and support in sharing of information, developments and good practices towards consolidating programmes for safety improvements. The ARC at Bangladesh University of Engineering and Technology could well be supported by WHO as their collaborating centre on road traffic accident prevention in developing and promoting effective road safety measures based on locally-based research on road traffic accidents.

Acknowledgement

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References


Strategies for Reducing Traffic Accidents Related to Alcohol Consumption in Khon Kaen Municipality

By
Sirikul Kulleab*, Sunanta Sriwiwat*, Amnat Thanomsab**, Chanhorm Srikhunsaan***

Abstract

Traffic injuries related to alcohol consumption is a serious problem which needs urgent attention and has to be solved. Of all vehicle drivers treated at Khon Kaen Hospital, 38.7% were drunk and most of the accidents took place in the Khon Kaen municipality area.

The objective of this study was to investigate the impact of strategies to reduce traffic injuries related to alcohol consumption.

The investigators conducted this study in Khon Kaen from December 2000 to January 2002 using the method of action research. The study was carried out in three phases. In the first phase methods for intervention were planned and prepared, and a multisectoral committee was set up. In the second phase the public was made aware of the forthcoming activities prior to the actual enforcement of measures. Sobriety checkpoints were set up once a week but drivers found drunk were not yet punished. This activity was intended to warn them. Drivers with blood alcohol levels more than 50 mg% were taken to court in the third phase. From June 2001 onwards, checkpoints were set up twice a week.

The data used for assessing the impact of the intervention were derived from a Geographic Information System (GIS)-based road accident database and from the trauma registry at Khon Kaen Hospital for 2000 and 2001, respectively. Data were analysed by calculating relevant proportions and if found appropriate, proportions were compared by applying the conventional Chi-square test. An additional survey was conducted in order to explore the opinion of people about the law enforcement measures undertaken.

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**Provincial Police Department, Khon Kaen
***Provincial Health Office, Khon Kaen
Checkpoints were set up 53 times and 23,663 vehicles passed through them; the drivers were screened by policemen. Seven hundred and fifty-six drivers were suspected of drunken driving and had to undergo the alcohol breathing test. As a result of this, 517 drivers or 68.4% were found to be actually drunk, while 199 (38.5%) of them had blood alcohol levels higher than 50 mg%. Compared with the year 2000, road accidents decreased significantly within the area of the Khon Kaen municipality. The numbers of injured and dead individuals declined as did the numbers of drunken injured patients and drunken drivers. The death rate of drunken patients and drivers also decreased. The results of the public opinion poll proved that 98.9% of people were in favour of the law that prohibited drunken driving and suggested that the law be enforced continuously and seriously.

In conclusion, multisectoral cooperation and participation of people are important factors in raising the awareness of the population before the actual enforcement of laws directed towards reducing traffic accidents.

Key words: Road traffic injuries, multisectoral cooperation, drunken driver.

Introduction

Accidents are one of the main problems in Thailand. It seems that they increase in number as well as in severity over the years. Accidents are not only causing the death of people but also have an economic impact in that possessions are damaged and lost. In 2002 the mortality rate due to accidents was 63.5 per 100,000 population and ranked second as cause of death for Thailand. Those affected are mainly males in the age group: 20-24 years. Compared with all kinds of accidents, traffic accidents have the highest mortality rate of 34.4% (Medical Institute of Accident and Public Disaster, Department of Medical Service, Ministry of Public Health, 1999)(1).

In 1999 the mortality rate due to traffic accidents for Khon Kaen province was 25.8 per 100,000 population and ranked third as the cause of deaths (Public Health Office, Khon Kaen Province, 2000)(2). According to the trauma register of Khon Kaen Hospital, 38.7% of all injuries due to traffic accidents within the area of the municipality of Khon Kaen are related to alcohol consumption (Witaya Chadbunchachai et al. 2003)(3). Driving under the influence of alcohol obviously is a major reason for traffic accidents and needs attention. Therefore this study was initiated and conducted to test the efficiency and effectiveness of strategies to reduce traffic accidents related to alcohol within the boundaries of the municipality of Khon Kaen.

Literature review

It has been known for a long time that alcohol consumption influences the functions of the brain. Under the influence of alcohol persons lose self control and the way a vehicle is driven by a drunken person worsens with increased alcohol intoxication (Phaiboon Suriyawongphaisam, 2000 cited from Borkenstein RF et al. 1974; Moskowitz et al. 1985)(4).
Investigations undertaken in the United States of America indicate that drivers on their way during weekend nights having an alcohol blood level of 0.15 mg/mL carry a risk to have a deadly traffic accident which is 380 times higher in comparison with sober drivers (Phaiboon Suriyawongphaisarn, 2000, cited from Borkenstein RF et al. 1974; Zador P., 1991)\(^4\). The risk to suffer from a deadly traffic accident directly relates to the degree of intoxication (Phaiboon Suriyawongphaisarn, 2000, cited from Insurance Institute of Highway Safety. Fact sheet July 1990:3\(^4\)).

In Australia most fatal traffic accidents and injuries are caused by drunken drivers. Fifty per cent of all traffic accidents in Western Australia are related to alcohol consumption and 48% of all pedestrians killed by traffic accidents were found to be drunk (Phaiboon Suriyawongphaisarn, 2000, cited from Waddell VP & Lee NA, eds. 1991)\(^4\).

From the records of the emergency units in Thailand, i.e. from the Police Hospital, Khon Kaen Hospital, and Lampang and Had yai Hospital, it appears that patients suffering from traffic injuries with an alcohol blood level over 50 mg% outnumber by eight times the patients of emergency wards who are sober. At the same time, patients with an alcohol blood level of 10 to 40 mg% outnumber patients in the emergency units who are sober by six times (Lampham S et al. 1995)\(^5\). This indicates that alcohol consumption carries the highest risk to suffer from traffic injuries compared to all other possible causes of injuries.

According to data from the trauma registry of the Khon Kaen Hospital, those who had been injured in connection with a traffic accident were 6.6 times more likely to have been intoxicated in comparison with all patients treated in the emergency unit and who were sober. The risk of those who were drunk to have a fatal injury was 9.6 times higher in comparison with other injured patients who were otherwise sober. If drivers in Thailand could reduce their alcohol blood levels to less than 50 mg%, quite a number of traffic accidents could be prevented and the lives of 2 922 victims could be spared, while the number of injured persons could also be reduced by 29 625. The economic damage caused by traffic accidents is estimated to be 13 975.5 million bahts (Direk Patamasiriwat, 1994)\(^6\).

All available information hints towards the fact that there is a strong direct relationship between alcohol intoxication and traffic accidents. Moreover, an increase in alcohol consumption results in an increase in traffic accidents (Jakkris Kanokkantapong & Sujit Leelawan, 1991)\(^7\).

**Strategies for the prevention of traffic accidents**

In the United States of America it was estimated for the year 1987, that in case alcohol-related traffic accidents could be prevented the death rate due to traffic accidents would drop by 47% and the lives of 20 000 to 24 000 persons per year could be saved (Phaiboon Suriyawongphaisarn, 2000, cited from Evans L, 1990)\(^4\).

An efficient method to reduce the number of drunken drivers on the road is to set up checkpoints and screen drivers for...
Strategies for Reducing Traffic Accidents Related to Alcohol Consumption in Khon Kaen Municipality

alcohol intoxication. This method has to be linked to extensive efforts to raise the awareness of people about the dangers of drunken driving (Phaiboon Suriyawongphaisarn, 2000, cited from Levy, Shee, Asch 1988, Ross 1992, Wells JK, Presusser DF, Williams AF 1993). While drivers were regularly checked for alcohol consumption in Tasmania the mortality declined 30% within 18 months (Phaiboon Suriyawongphaisarn, 2000, cited from Lawrence R, Farrar J, Cambell W, 1987) and in New South Wales the rate was reduced by 20% within 48 months (Phaiboon Suriyawongphaisarn, 2000, cited from Peacock, 1992).

The setting up of checkpoints for screening drivers for alcohol consumption by using the alcohol breathing test is considered to be a good method to enforce the law against drunken driving (Phaiboon Suriyawongphaisarn, 2000, cited from Stuster & Blower, 1995). In 1982 New South Wales passed a law against drunken driving, which did allow the arrest of drunken drivers. Community surveys showed that the awareness of being at risk of getting arrested if found to be driving under the influence of alcohol, spread readily and increased from 76% to 87% in five years. Within this time the proportion of those who could not resist drinking alcohol before driving dropped from 80% to 40%. At the same time, however the number of checkpoints and the time used for screening drivers increased by 40% to 50% (Phaiboon Suriyawongphaisarn, 2000, cited from Homel et al. 1990). The best results for enforcing the law had been achieved by setting up checkpoints continuously; spreading them over a vast area and selecting the points along the roads randomly (Phaiboon Suriyawongphaisarn, 2000, cited from Elliot B, 1992:14).

From the evidence mentioned above it is very obvious, that drunken driving is one of the main causes for traffic accidents and the reason for traffic injuries and deaths. A major tool for preventing alcohol-related traffic accidents is to enforce the law and to prevent drivers from driving in an intoxicated state.

<table>
<thead>
<tr>
<th>Law enforcement</th>
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<tbody>
<tr>
<td>- Train those in charge of enforcing the law and support them.</td>
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<tr>
<td>- Set up road checkpoints for screening drivers using the alcohol breathing test and ensure multisectorial cooperation by government and the private sector.</td>
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<tr>
<th>Create public awareness through:</th>
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<tr>
<td>- Radio - Posters.</td>
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<td>- Leaflets - Stickers.</td>
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<tr>
<td>- Other media.</td>
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<td>- Large billboards along the roads.</td>
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<th>Driver's behaviour</th>
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<td>- Decrease in drunken driving.</td>
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<th>Decreased traffic-related injuries</th>
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<tr>
<td>- Decrease in the number of injuries.</td>
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<td>- Decrease in the mortality rate.</td>
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<tr>
<th>Participation of community</th>
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<tr>
<td>- Training courses for volunteers.</td>
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<td>- Training courses for media personnel.</td>
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<tr>
<td>- Volunteers for public relation campaigns.</td>
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<tr>
<td>- Volunteers for operating checkpoints and applying alcohol breathing tests.</td>
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</table>
According to the conceptual framework, law enforcement measures will use the setting up of checkpoints for screening drivers of passing-by vehicles and use the alcohol breathing test in case there is the suspicion that they are drunk. The awareness of the dangers of drunken driving will spread among communities and they will be informed that they risk being arrested if found to be driving under the influence of alcohol. These measures applied through multi-sectoral cooperation, will decrease the number of traffic accidents, as also the numbers of injuries and deaths.

General objective
To study the effectiveness of strategies applied for reducing traffic accidents related to alcohol consumption in the Khon Kaen municipality.

Specific objective
To reduce traffic accidents and to decrease the numbers of traffic injuries and deaths related to alcohol consumption in the Khon Kaen municipality.

Methodology
The study area was within the boundaries of the Khon Kaen municipality and the target population were the drivers of various kinds of vehicles. The investigation was conducted between December 2000 and January 2002.

Procedures
The study was conducted within three phases:

Phase 1: Planning and preparation (December 2000)
The meeting of the Accident Prevention Committee of the Khon Kaen province took place to discuss traffic accidents related to alcohol consumption. The resolution of the meeting was to reduce traffic accidents related to alcohol consumption within the Khon Kaen municipality through multi-sectoral cooperation between the government and the private sector.

- Four sub-committees were appointed to launch the project:

1. Administrative Committee
   The provincial governor acted as chairman of the committee. Members of the committee were participants from the Accident Prevention Committee. The provincial medical officer acted as secretary of the committee.

2. Public Relations Committee
   The Director of the Public Relations Unit of Khon Kaen Area 1 acted as the Chairman. Representatives of the media were the members of this committee. The provincial Public Relations Officer was selected secretary of the committee.

3. Law Enforcement and Supporting Committee
   The Deputy Governor of the Khon Kaen province (Mr Suwat Tanprawat) was the Chairman. The members of the committee were derived from the government and the private sector.
sector, such as the highway police unit, the provincial police unit, public health unit, municipality of Khon Kaen, various foundations, the Khon Kaen Hospital, the media, and civil volunteers for disaster prevention. The police officer of the provincial police station was the secretary.

(4) Evaluation Committee

The Provincial Health Officer was appointed Chairman. All the directors of hospital within the municipality were members of the committee. The director of the Khon Kaen Hospital served as secretary of the committee.

- Documents for public relations were drafted.
- Meetings of the planning committee took place.
- Training courses for the members of the Law Enforcement and Supporting Committee were carried out. The set-up of checkpoints was discussed, and use of the alcohol breathing test equipment was explained and demonstrated, the legal background for setting up checkpoints and conducting the breathing test clarified, and the assignment as well as the function of each unit defined.

Phase 2: Awareness campaigns and prevention of traffic accidents (January to February 2001)

Awareness campaigns were undertaken through the following activities:

- Setting up of large billboards along the roads within Khon Kaen municipality;
- Attachment of banners at the pedestrian flyovers within Khon Kaen municipality;
- Cooperation of government and the private sector to start the poster campaign to make the public aware, that from March 2001 onwards, those who will be found driving drunk will be arrested;
- Distribution of leaflets, stickers and posters, etc. to all media, government units and the private sector;
- Promotional campaigns through radio programmes and the public announcement system within the subdistricts of the Khon Kaen municipality;
- Special radio programmes about the prevention of drunken driving campaign at the Media Cast Organization of Thailand (MCOT) and Khon Kaen Radio Station at 90.75 MH, between 16.30 to 17.00 hours from Mondays to Fridays, and from January to December 2001;
- Training courses for volunteers of the public announcement system within all sub-districts of the municipality of Khon Kaen;
- Meeting of the representatives of the media on 16 February 2001 from 14.00 to 16.00 hours at the Siengcan Meeting Room within the City Hall of the Khon Kaen province concerning the awareness campaign;
A motorcade drove on 22 February 2001 through the streets of Khon Kaen raising the attention of people about the campaign and warning them of arrests in case anyone was found indulging in drunken driving, and

Exhibition of posters at the provincial bus terminal and the air-conditioned bus terminal on all national holidays.

**Trial period**

The setting up of checkpoints for screening drivers and the use of the alcohol breathing test involved 30 to 40 persons each time. Those posted at the checkpoints were members of the Law Enforcement and Supporting Committee of which the Deputy Governor was the Chairman. Personnel were recruited from and comprised the provincial and highway police unit, transportation unit, municipality officials, soldiers, civil volunteers for disaster prevention, public health unit, medical science centre, officials from the Khon Kaen Hospital, members of the media, and provincial insurance and private insurance companies.

Within the period: January-February 2001, checkpoints were set up at various randomly-selected points between 22.00 and 24.00 hours. Drivers were screened and the alcohol breathing test used. Stickers were affixed on the passing cars and leaflets distributed to drivers warning them not to drive in the drunken state.

The setting up of checkpoints and use of the alcohol breathing tests involved the following procedures:

1. Selecting suitable locations for the checkpoints and preparing alcohol breathing test devices.
2. Each unit was informed about its particular function.
3. Leaflets were distributed and stickers affixed on passing cars.
4. Screening of drivers: Those suspected of drunken driving and who were further examined by the police displayed the following signs and symptoms: Smell of alcohol, physical appearance of being drunk such as red eyes, red face, speaking with drunken voice, or while driving the vehicle swaying from one side to the other, and not following the orders of the police.
5. Application of the alcohol breathing test in case drivers were suspected to be drunk. They were questioned whether they knew about the law about prohibiting them to drive intoxicated. They were instructed about the traffic laws and were also given leaflets. If they seemed to object to the procedure, the text of the law was read out to them and the contents explained.
6. Drivers had to undergo the alcohol breathing test.
7. In case drivers were found to have a blood alcohol level of more than 50 mg%, they were advised to rest and drink water. They had to wait until the blood alcohol level decreased below the level of 50 mg%. In case a sober passenger with a driving licence was in the car as well, he or she was asked to drive further on.
The media continuously followed upon the project and reported its activities and achievements.

During the trial phase checkpoints were set up nine times, 7,240 vehicles passed through them and 393 (5.4%) drivers were suspected of driving drunken and underwent the alcohol breathing test. From out of those tested, 209 (53.2%) tested positive while 97 (46.4%) had blood alcohol levels higher than 50 mg%. Throughout the whole trial period of two months, 49 persons per month were found with blood alcohol levels above 50 mg%.

**Phase 3: Law enforcement (March to December 2001)**

Drivers found with blood alcohol levels above 50 mg% were sentenced by the court to pay a fine of 1,500 bahts, and though they were supposed to undergo imprisonment for one month, they were set free for a probation period of one year. During this probation year they had to present themselves at the court every three months and had to work 12 hours for the public.

Between March and June 2001, checkpoints were set up and breathing test performed once a week from 22.00 to 24.00 hours.

In June 2001 a random sample of 1,000 individuals was taken from the population of the municipality of Khon Kaen. They were questioned about their opinion of the project. Almost all (98.9%) were supportive of the project and did agree to the measures used to enforce the law. In addition they suggested that the project be continued permanently and seriously.

The experiences gained so far encouraged the responsible committee to increase the setting up of checkpoints from once to twice a week between 22.00 to 24.00 hours from July to December 2001. (In case it was raining heavily during the night the checkpoint was supposed to be set up, the activity was cancelled).

During this period, checkpoints were set up 44 times, 16,423 vehicles passed through them, 363 (2.2%) drivers were suspected of drunken driving, 308 (84.8%) of them tested positive to the alcohol breathing test, and 102 (33.1%) had blood alcohol levels above 50 mg%. In average 10 persons per month were found to be intoxicated above the level of 50 mg% of blood alcohol. Those found guilty of breaking the law were produced in the court and sentenced. However a number of drivers might have evaded the breathing test despite having consumed alcohol before driving, by behaving normally and not getting detected as being intoxicated at the time of checking. It is assumed that the majority of such individuals might not have had their blood alcohol levels above 50 mg%.

**Procedures**

Data analysis (Figure) was done by calculating relevant proportions and comparing them, using the conventional Chi-square test.

Data were derived from:

- Questioning the individuals comprising the random sample taken from the population of Khon Kaen municipality in June 2001;
Results

(1) By setting up checkpoints 53 times from January to December 2001, 756 drivers from 23,663 vehicles passing by were suspected of driving under the influence of alcohol and had to undergo the alcohol breathing test. Out of these, 517 drivers, that is 68.4% of all undergoing the breathing test or 2.2% of all drivers passing through the checkpoint tested positive. Of all drivers who went through the breathing test, 199 persons or 38.5% had blood alcohol levels more than 50 mg%. On the basis of all vehicles passing through the checkpoints, 0.8% drivers were found to have blood alcohol levels beyond the level permitted by law. Of all the drivers found with higher alcohol levels than allowed, 85 persons (47.2%) were in the age group 21 to 30 years. Categorizing the culprits according to occupations, 124 (24%) were civil servants and 103 (20%) were employees. Out of 10 bus drivers eight (80%) had blood alcohol levels above 50 mg%; and of the 135 motorcyclists found riding their motorbikes under the influence of alcohol, 74 or 54.8% were intoxicated above the tolerated blood alcohol level (Table 1).

(2) In assessing the achievements of the project, the number and rate of traffic accidents within Khon Kaen
municipality before starting the project in the year 2000 were compared with the same information collected in the year 2001 after the project came to an end. Data were collected from the GIS-based road accident data-base and the trauma registry of the Khon Kaen Hospital. From 2000 to 2001 the traffic accident rate decreased by 429.6 per 100 000 population (Table 2).

Table 1. Types of vehicles used by alcohol-intoxicated drivers according to their blood alcohol level, Khon Kaen municipality, Thailand, 2001

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>No. of drivers undergoing alcohol breathing test</th>
<th>Persons</th>
<th>Percentage</th>
<th>Persons</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>115</td>
<td>97</td>
<td>81.7</td>
<td>29</td>
<td>30.9</td>
</tr>
<tr>
<td>Pick-up truck</td>
<td>318</td>
<td>243</td>
<td>76.4</td>
<td>82</td>
<td>33.7</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>157</td>
<td>135</td>
<td>85.9</td>
<td>74</td>
<td>54.8</td>
</tr>
<tr>
<td>Truck</td>
<td>91</td>
<td>35</td>
<td>38.5</td>
<td>6</td>
<td>17.1</td>
</tr>
<tr>
<td>Bus</td>
<td>71</td>
<td>10</td>
<td>14.1</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>756</td>
<td>517</td>
<td>68.4</td>
<td>199</td>
<td>38.5</td>
</tr>
</tbody>
</table>

Source: Municipality checkpoint survey

The traffic injury and mortality rates for Khon Kaen municipality were estimated using the data from the trauma registry of the Khon Kaen Hospital and the records of the Srinakarin University Hospital. From 2000 to 2001 the traffic accident injury rate decreased by 76.8 and the traffic mortality rate by 9.6 per 100 000 population (Table 3).

Table 2. Comparison of the traffic accident rate in Khon Kaen municipality for the years: 2000 and 2001

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of traffic accidents</th>
<th>Traffic accident rate per 100 000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>2 056</td>
<td>1 835.7</td>
</tr>
<tr>
<td>2001</td>
<td>1 818</td>
<td>1 406.1</td>
</tr>
</tbody>
</table>

(3) The traffic injury and mortality rates for Khon Kaen municipality were estimated using the data from the trauma registry of the Khon Kaen Hospital and the records of the Srinakarin University Hospital.

From 2000 to 2001 the traffic accident injury rate decreased by 76.8 and the traffic mortality rate by 9.6 per 100 000 population (Table 3).

Table 3. Comparison of the traffic injury and traffic mortality rates in the Khon Kaen municipality between the years 2000 and 2001, based on records from the Khon Kaen Hospital and the Srinakarin University Hospital

<table>
<thead>
<tr>
<th>Year</th>
<th>Injuries</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Persons</td>
<td>Per 100 000 population</td>
</tr>
<tr>
<td>2000</td>
<td>5 192</td>
<td>4 357.2</td>
</tr>
<tr>
<td>2001</td>
<td>5 265</td>
<td>4 280.4</td>
</tr>
</tbody>
</table>

The traffic injury rate of drivers due to alcohol intoxication within the municipality of Khon Kaen decreased significantly from the year 2000 to 2001 by 5.1% (Table 4).

Table 4. Comparison of the injury rates for the years 2000 and 2001 of drunken drivers treated within the Khon Kaen Hospital and the Srinakarin University Hospital

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of injured drivers</th>
<th>Number of alcohol-intoxicated injured drivers</th>
<th>Per cent</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>3 053</td>
<td>1 121</td>
<td>36.7</td>
<td>&lt;0.003</td>
</tr>
<tr>
<td>2001</td>
<td>2 933</td>
<td>926</td>
<td>31.6</td>
<td></td>
</tr>
</tbody>
</table>
In the year 2001 the rate of traffic accidents in the Khon Kaen municipality, in which alcohol consumption was involved, decreased significantly by 2.7% in comparison with the year 2000 (Table 5).

From 2000 to 2001 the death rate of drunken drivers within the Khon Kaen municipality declined by 32.4% (Table 6).

Table 5. Comparison of the traffic injury rates of persons under the influence of alcohol, being treated in the Khon Kaen Hospital and the Srinakarin University Hospital for the years 2000 and 2001

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of injured persons</th>
<th>Cases of injuries with alcohol intoxication</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Persons</td>
<td>Per cent</td>
</tr>
<tr>
<td>2000</td>
<td>5 192</td>
<td>1 411</td>
<td>27.2</td>
</tr>
<tr>
<td>2001</td>
<td>5 265</td>
<td>1 292</td>
<td>24.5</td>
</tr>
</tbody>
</table>

Table 6. Comparison of the death rate within Khon Kean municipality of drunken drivers for the years 2000 and 2001

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of deaths</th>
<th>Dead, alcohol-intoxicated drivers</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Persons</td>
<td>Per cent</td>
</tr>
<tr>
<td>2000</td>
<td>56</td>
<td>23</td>
<td>41.1</td>
</tr>
<tr>
<td>2001</td>
<td>46</td>
<td>4</td>
<td>8.7</td>
</tr>
</tbody>
</table>

Conclusions and discussion

The combination of various measures to decrease traffic injuries caused by driving under the influence of alcohol such as setting up of road checkpoints; awareness campaigns, and the multisectoral cooperation of government and the private sector proved to be successful. The encouraging outcome of the public opinion poll from a representative sample of the population of the Khon Kaen municipality was a very helpful encouragement in the third phase of the project. People in general are very much aware about the problems related to traffic accidents and very much support the law prohibiting drunken driving. This attitude of the people would help in future to prevent driving while intoxicated.

The methods applied in this study, in particular the setting up of checkpoints and the use of the alcohol breathing test, seemed to work, thereby indicating that the number of traffic accidents can be reduced. It is worth noting however from the information gathered from checkpoints, that drunken motorcyclists ranked second among those found with a blood alcohol level of more than 50 mg%. This confirms the findings of the study of Veera Kasarntikul et al. (2001)\(^8\). The majority of traffic accidents occurred in the city and mainly teenagers riding a motorcycle were involved. This study, trying to work against drunken driving, however concentrated more on the highways where the majority of vehicles involved were cars, trucks and buses. To reach the young motorcyclists too, similar campaigns like this study should also concentrate on the inner city.

Recommendations

The study recommends that:

- The activities carried out for this study should be continued and seriously supported.
- The measures taken against drunken driving should also be undertaken in other areas as well.
More attention should be paid to motorcyclists who were found to very often have blood alcohol levels above 50 mg% and ranked second among all drivers found intoxicated and with blood alcohol levels higher than the level still tolerated by law.

All provincial agencies related to traffic issues should strongly support the campaign.

Similar projects should be supported through government funds.

A nationwide policy to enforce traffic laws, which are expected to be instrumental in reducing the number of traffic accidents, is necessary. As a result of this, the traffic-related mortality will decrease and the wastage of resources decline.

In the setting up and operating of checkpoints, multisectoral cooperation should be aimed at. In fact, prior to the setting up at checkpoints, a public awareness programme should be launched.

Acknowledgements

The success of this project, aimed at reducing alcohol-related traffic accidents within the Khon Kaen municipality, would not have been achieved without the cooperation and excellent support from the Accident Prevention Committee of Khon Kaen province.

The continuous support and encouragement from the Governor of the Khon Kaen province, and from all other agencies and individuals who supported this project by various means, are very much appreciated.

The JICA office and the Shell Company deserve particular recognition and thanks for providing the alcohol breathing test equipment and other necessary devices as well as for providing various documents that were needed for this study. Special thanks also to the Viriya Insurance Company which provided advice and valuable information about the complex issue of traffic accidents.

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Enforcement - A Key Component for Traffic Management in Developing Countries - India

By
Rohit Baluja*

Road traffic enforcement should develop a culture of responsible road use which demonstrates concern and respect for other road users. Enforcement should lead to a smooth flow of road traffic without compromising on safety, saving of time, protection of environment and fuel conservation. Effective enforcement is one where the behaviour of the road user is within the defined legal, engineering and ethical framework - where the right of way is truly respected.

It is not about the quantity of fines collected but how fines and other punitive measures reduce traffic violations leading to a positive road culture.

Enforcement in a Developing Country - India

Enforcement of road traffic in India is a unique challenge primarily because the subject has not been adequately defined or deliberated upon.

The major challenges are:

- Mixed traffic conditions: Delhi, for example, has over 30 modes of transport using the same road;
- The Motor Vehicles Act defines the responsibility of motorized vehicles only, leaving out the non-motorized user in the absence of a Road Traffic Act;
- Enforcement is not linked to engineering, driver training or road education;
- The role and responsibility of enforcers are not defined, nor are they adequately trained;
- Enforcement agencies do not work in coordination;
- Tools and systems of training are lacking;
- Enforcers are willing to compromise;
- Lack of political will;

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• Absence of driver training and negligent driver-testing;
• Poor road awareness;
• No standardization of traffic control devices;
• Absence of traffic engineering as a science;
• Unprecedented growth of motorized/non-motorized vehicles in the absence of a basic public transport system;
• Accident investigation - no qualitative information of causes and consequences of crashes - without which remedial measures are only hypothetical;
• Without scientific investigation, punitive measures are enforced arbitrarily.
• Enforcement in rural areas or on the highways hardly exists, whereas in the urban metropolitan areas it is treated as a means of revenue collection;
• Vehicle maintenance is a neglected area and vehicle safety enforcement is almost non-existent;
• Right of way is not defined by the road maker, road maintainer, or the road user; enforcers are also ignorant, and
• Road encroachments are common and parking management is neglected.

Enforcement needs to be defined within the holistic perspective of traffic management along with other key elements of traffic management. The Transport Ministry at the federal level has to play a key role in defining, guiding, facilitating, motivating, auditing and coordinating the responsibilities and activities of the State Transport Departments.

Driver Training

There has been a vacuum as far as driver training and testing are concerned. There is almost no formal training for motorized two-wheeler riders. It is a misconception that two-wheeler riders have graduated from bicycles and therefore do not require training. Only a negligible percentage of two-wheeler riders obtain a driving licence after visiting a driving school.

Moreover, driving schools only teach the basic skill of maneuvering, but not the road rules, regulations and hazards. Knowledge of traffic control devices or about the vehicle is hardly ever imparted. For the heavy motor vehicles segment, only a few driving schools exist in the country.

A majority of drivers who obtain a licence graduate from being “cleaners”. In the true ‘teacher-student tradition' of our country, knowledge is handed down the generations - including the mistakes, misconceptions and bad practices. Ironically, even those who test drivers prior to issuing a licence or the driving school instructors, do not have formal training.

Role of Highways and Civic Authorities

The highways and local civic authorities responsible for construction, maintenance and management of safe, efficient, and
environmentally-acceptable road infrastructure and highway facilities should implement standard practices of road safety engineering. Besides physical construction or alteration of roads, they should create a road environment that is safe, particularly for the more vulnerable users, like pedestrians, cyclists, the disabled, the old and the young.

Conducting safety audits and liaising with traffic management authorities in accident prevention must be accorded top priority.

Traffic Engineering

One of the biggest causes of enforcement failure is that traffic engineering is not recognized as a science, and often the road infrastructure is not conducive to enforcement of the law. For example, statutory directions on installation of traffic control devices, as well as traffic engineering techniques are absent. The wheel of traffic engineering is reinvented by every civic, highways and police authority across the country. They make and learn from the same mistakes, causing an unimaginable loss to the exchequer, not taking into account public time, health and fuel that are wasted in the process.

A dedicated Traffic Engineering Department in every metropolitan city to start with is a must, working closely with the traffic police. Every city with a population of more than one million should have an independent Traffic Engineering Department. Once established, many more universities and institutions will automatically introduce and expand traffic engineering courses as the demand for traffic engineers rises.

Road Laws

As the Motor Vehicles Act does not include non-motorized road users, the latter tend to break laws with impunity and become the victims of road accidents. For example, in Delhi out of the 1,700 annual fatalities on roads, 900 are pedestrians. Therefore, it is important to promulgate a Road Traffic Act wherein the responsibility of road use is defined for every road user.

Ambiguity of law/misinterpretations:
Laws are not respected when they are not clearly defined. Laws are also not respected when the road users to whom these laws are applicable are unaware of them. Therefore laws must be made as simple as possible, in consultation with all stakeholders, and should be promulgated only after wide publicity. Some laws pertaining to: the use of helmets; seat-belts; drinking and driving; applicable speeds; mobile phones, and vehicle maintenance have not been successfully enforced due to ambiguity or lack of political will.

Traffic Police

In addition to the role played by the police in the maintenance of law and order, the traffic police have the statutory responsibility of judicious enforcement of traffic regulations as prescribed.

Consultation with other agencies and the public in creating a safe road culture should be the primary role of the traffic police force. As part of this role, the traffic police should also emphasize management of safe and smooth flow of traffic, minimize the incidence of accidents, effectively
prosecute traffic violators, conduct accident investigation, and lay greater stress upon road user education.

For enforcement of road safety measures for the non-motorized road users the police must use:

**Preventive methods:**

1. Control and direct the non-motorized traffic to ensure their safe movement;
2. Guide and help the road users unfamiliar with the specific rules and regulations;
3. Make sure that pedestrians/cyclists use such facilities like pedestrian crossings, subways etc. and that they do not become potential hazards to safety;
4. Help the disabled road users without compromising their safety, and
5. Ensure the provision of standardized control devices.

**Persuasive methods:**

1. Issuing verbal warnings for offences;
2. Use methods like deflating tyres of bikes/rickshaws of those who violate basic safety laws; and
3. Holding the erring road users in custody for a short duration.

Police training schools, colleges and academies must have a planned curriculum on all aspects of traffic management. Before being posted with the traffic police, all police personnel must undergo specialized training.

India is a large country with diverse cultures, languages and religions. The results of road safety enforcement should however be the same although the tools and systems for achieving it may have to be tailor-made to suit specific environments.

**Collision Investigation and Research**

A separate department of Collision Investigation and Analysis should be established in each metropolitan city under the Traffic Police and on highways under the respective Highway Authority. It is also recommended that each collision, where a serious injury, vehicle damage or fatality takes place, should be studied and the collision scientifically analysed and reconstructed in detail.

Reconstructing serious collisions would provide information about their causes and consequences. Analysis of such information would help the authorities find solutions in the areas of road user awareness, driver training, road engineering and enforcement for enhancing road safety.
Women’s Health

Changing Family Planning Scenario in India*

By
K.G. Santhya, PhD*

Abstract
Over the decades, there has been a substantial increase in contraceptive use in India. The direction, emphasis and strategies of the Family Welfare programme have changed over time. However, meeting the contraceptive needs of considerable proportions of women and men and improving the quality of family planning services continue to be challenges. The 1990s witnessed a growing recognition of this, and several innovative policy and programme initiatives have since been launched to address these issues. This paper reviews and synthesizes evidence from surveys and studies conducted in the 1990s and thereafter on the dynamics of contraceptive use and the unmet need for contraception in India. The paper also discusses some of the barriers that hindered the success of the programme and sheds light on new initiatives to address these, and assess their impact if any. The paper makes suggestions for areas that need further programme and research attention.

Introduction
Over the decades, contraceptive use has been increasing in India. At the same time, there is a substantial unmet need for contraception. The contraceptive scenario is also characterized by the predominance of non-reversible methods, limited use of male/couple-dependent methods, substantial levels of discontinuation, negligible use of contraceptives among both married and unmarried adolescents and wide regional variations.

Contraceptive Scenario
Nationally, nearly one half of currently married women (48%) were using some
method of contraception in 1998-1999.\(^1\) Contraceptive prevalence varied widely among states, from less than 30% in Bihar, Meghalaya and Uttar Pradesh to more than 60% in Delhi, Haryana, Himachal Pradesh, Kerala, Punjab, Maharashtra and West Bengal. Data for the 1990s, as reflected in the National Family Health Survey (NFHS)-1 and 2, indicate that current contraceptive use increased by 18% nationally.\(^1\)

There has been an overall increase in contraceptive use in almost all states, except Goa, Jammu and Kashmir, and Meghalaya over the same period.

Method mix
Since the nineteen sixties, the family welfare programme has in theory adopted a ‘cafeteria approach’ whereby clients are provided with a choice of contraceptive methods. However, it is well documented that, until recently, the programme emphasis remained skewed towards promoting non-reversible methods, particularly female sterilization. Nationally, sterilization (female and male, but primarily female sterilization) accounts for 84% of current contraceptive prevalence due to modern methods and 75% of overall contraceptive prevalence.\(^1\)

Although reported by a negligible minority, sterilization was the most common method used even among married adolescents, and a review of data on contraceptive behaviour of adolescents in Asian countries shows that India is the only country where such a pattern prevails.\(^5\) The predominance of sterilization is observed in almost all states; more than 90% of modern contraceptive method users are sterilized in all the southern states and Bihar; the situation is most skewed in Andhra Pradesh, where 97% of all modern method users are sterilized. Exceptions include Delhi, Punjab and a few north-eastern states where fewer than three in five users of modern methods are sterilized.

Officially-sponsored spacing methods (oral contraceptive pills, intra-uterine device [IUD] and condoms) account for 14% of current contraceptive use. The use of traditional contraceptive methods is reportedly low, accounting for 10% of current contraceptive use in the country.

Direct evidence on the use of male methods is scarce as men have been excluded from most of the national surveys, and small-scale studies exploring the contraceptive behaviour of men are limited. Nationally, data based on the responses of currently married women show that one in ten currently married ‘couples’ were using male/couple-dependent contraceptive methods (condoms, vasectomy, withdrawal and periodic abstinence) in 1998-1999, which translates into 21% of the total current contraceptive prevalence.\(^1\)

The data also show that the use of male/couple-dependent methods was as low as 2% of currently married couples in Bihar, Mizoram and Karnataka, and as high as 23%-28% of currently married couples in Delhi, Punjab and West Bengal.

Specific data on the use of modern male methods show that only a small minority of currently married couples were using such methods (condoms: 3% and vasectomy: 2%). Condom use was typically low in almost all the states, except Delhi and Punjab, where 18% and 14% respectively of currently married couples were using condoms. Nationally, over the nineties, the
extent of use of male/couple-dependent methods remained the same. At the state level, all the southern states recorded a decline in the proportion of currently married couples using male/couple-dependent methods during the nineties (a decline ranging from 21% to 46%). Among the four major northern states, while Madhya Pradesh and Bihar recorded a decline, the proportion of couples using male methods increased in Rajasthan and Uttar Pradesh.

Contraceptive discontinuation and switching

As contraceptive use increases and becomes a more established behaviour, prevalence is no longer a sufficient marker of programme success. Contraceptive continuation may become more important than acceptance in increasing contraceptive prevalence.

In India, as the vast majority (66%) of ever-users are sterilized, only a small proportion of ever-users have the option of discontinuing its use. Nationally, data from NFHS-2 show that one in ten currently married women who have ever used a contraceptive method (which translates into 29% of ever-users of reversible methods) had discontinued its use at the time of the survey. The data also show that younger women (15–24-year-olds) were more likely to discontinue using contraceptives compared to older women. Younger women were also more likely to mention the desire for a child and less likely to mention side-effects as their main reason for discontinuation. However, younger women were no more likely than older women to discontinue contraceptive use due to method failure or difficulty in accessing a suitable method. Notably, contraceptive discontinuation was comparatively higher in the northern and north-eastern states, particularly the latter, than in the southern states. Moreover, women who discontinued using contraceptives in the northern and north-eastern states more frequently reported difficulty in accessing a method or inconvenience in using a method as reasons for discontinuation, compared with women in the southern states. Studies show higher discontinuation levels for oral contraceptive pills and condoms than IUDs. The tendency to discontinue contraceptive use seems to be more common in rural areas than in urban areas.

Information on patterns of contraceptive switching is limited. An analysis of data on future use of contraceptives available from NFHS-2 sheds light on the intended pattern of switching among current discontinuers and indicates that one third intend to use another method within 12 months from the time of the survey, another one third intend to use a method some time later, and the rest do not intend to use any method at all. While nearly one half (46%) of the potential contraceptive switchers plan to use female sterilization, one fifth plan to switch to pills, one tenth to condoms and another one tenth to natural family planning. Among discontinuers who intend to switch to a method within 12 months, the choice tends to be more in favour of reversible methods (48% for modern reversible methods, 10% for natural family planning methods and 33% for non-reversible methods). A prospective follow-up study of IUD users in Gujarat shows that approximately one third of those who discontinued contraceptive use after 12-18
months did not switch to any other method, one in ten switched to female sterilization, one in twenty to natural methods, 3% to oral pills and 3% to condoms.\textsuperscript{(5)}

**Unmet need for contraception**

Despite improved availability and access to contraceptive services, a substantial proportion of pregnancies (21\% of all pregnancies that resulted in live births nationally) were unplanned (mistimed or unwanted).\textsuperscript{(1)} It is estimated that if all unwanted births could be eliminated, the total fertility rate would drop to the replacement level of fertility. Moreover, several studies report that the desire to limit family size and to space the next birth are the main reasons mentioned by the majority of abortion seekers.\textsuperscript{(8)} clearly highlighting that there is a substantial unmet need for contraception among women in India.

The NFHS-2 reports that 16\% of currently married women have an unmet contraceptive need, which translates into one fourth of women who wish to space or limit births.\textsuperscript{1} Based on the current population of 1 027 million, this implies that approximately 40 million married women have an unmet need.\textsuperscript{(6)} While the needs of the vast majority of women who wish to stop childbearing are being satisfied, the needs of women who wish to delay or space childbearing remain largely unsatisfied. For example, it is estimated that the needs of 86\% of women who wish to stop childbearing are addressed by the existing services, compared to the needs of 30\% of women who wish to delay their next pregnancy.

Young women are more likely to have an unmet need for contraception. According to NFHS-2 data, 25\% of young women, compared to 17\% of women aged 25-34 years and 7\% of women above 35 years, had an unmet need for contraception.\textsuperscript{(1)} When translated in terms of young women who wished to space or limit births, this implies that the existing service delivery system was addressing the contraceptive needs of only 44\% of young women. Among women who have not given birth, the contraceptive needs of only 25\% of women are satisfied.\textsuperscript{(1)} In addition to the strong programmatic emphasis on sterilization until recently, this may be partly due to the neglect of young women by the programme that perceives a contraceptive need among young people only after they have completed their family formation. Evidence is emerging, however, that young couples, despite community norms that favour a first child soon after marriage, would prefer delaying the first birth until they have spent more time together getting to know each other better.\textsuperscript{(10)}

There are pronounced regional differences in the proportion of women with an unmet need for contraception. The NFHS-2 shows that the level of unmet need is higher in northern and north-eastern states than in southern states - 19\% vs. 11\%. There are substantial differences in the unmet need within each region as well. In southern states, for example, 8\% of married women in Andhra Pradesh had an unmet need for contraception, compared to 17\% in Goa. Similarly, the level of unmet need in northern states ranged from 7\% in Punjab to 25\% in Bihar and Uttar Pradesh, and in the north-
eastern states from 16% in Mizoram to 36% in Meghalaya. (1)

The proportion of women with an unmet need declined by 19% during the six years between NFHS-1 and NFHS-2; the decline was more pronounced in the case of unmet need for spacing (by 25%) than for limiting (12%) (see Figure 1).

The family planning programme has been successful in improving contraceptive acceptance and reducing fertility rates but its achievements have been modest. While contextual and structural factors (high levels of illiteracy, poor access to sources of knowledge, poverty, gender and non-gender-based disparities) are partly responsible, the direction, emphasis and strategies followed hitherto in the family welfare programme have contributed largely to the limited success of the programme.

Barriers to Meeting Contraceptive Needs

As is known, the small family norm is widely accepted (the mean ideal family size reported by young people currently is 2.5 children) and general awareness of contraception is universal (99% of currently married women in the reproductive age group were aware of a contraceptive method). However, awareness of reversible (modern or natural) methods is relatively limited among both women and men. Nationally, for example, only 71% of currently married women were aware of condoms. (1) In some major states including Andhra Pradesh, Karnataka, Madhya Pradesh

Figure 1: Trends in unmet need for spacing and limiting

and Orissa, fewer than three in five currently married women were aware of condoms. Awareness of specific reversible methods that are suitable for young women was even more limited among young women compared to other women. For example, only three fifths of married adolescents were aware of condoms, compared to nearly three fourths of women between 20-34 years. Small-scale studies show that a substantial proportion of unmarried boys and girls also lack contraceptive knowledge.

Inadequate knowledge of contraceptive methods, and incomplete or erroneous information about where to obtain methods and how to use them are the main reasons for not accepting family planning. Studies assessing correct, adequate and timely knowledge suggest that only a small proportion have complete knowledge of various contraceptive methods.

In many cases, men and women who were otherwise aware of contraceptive methods did not have timely knowledge. Studies show that if these couples had such knowledge during the initial years of their married life, they might have delayed the first pregnancy.

Limited male involvement

Within the patriarchal set-up in India, women have relatively little power. The critical role of the husband has been noted in several studies on decision-making related to the use of contraception, especially during the early years of marriage. Male health workers could play an important role in promoting male involvement in reproductive and child health. However, two thirds of primary health centres in India do not have a male health worker. Moreover, the Reproductive and Child Health Programme document offers no clear guidelines on the role of male workers. The experience in Karnataka shows that male workers who traditionally focused on malaria and tuberculosis screening and follow-up, view reproductive and child health as the domain of the female worker.
Limited informed choice

The public sector essentially provides five contraceptive methods - two forms of tubectomy (laproscopy and minilap), vasectomy (including 'no-scalpel' vasectomy), IUDs (Copper T200), oral pills (combined) and condoms. Efforts to broaden the basket of choices have been under way, including clinical trials to assess the safety and efficacy of available methods such as estrogen-progestogen combination injectables, vaginal rings and long-acting IUDs, and the development of new methods of male and female fertility regulation.\(^{(35)}\) As part of expanding contraceptive choice, the government has introduced emergency contraceptive pills in the Reproductive and Child Health programme.\(^{(36)}\) However, most women and men, particularly those who rely on the public sector (76% of current users of modern methods rely on the public sector)\(^{(1)}\), do not have access to a wide choice of contraceptives. Methods that are perceived as less effective including pessaries, spermicides, diaphragms, or are controversial including injectables and implants, are either dropped from the public programme, or are not introduced or are given low priority by health workers. The recently-introduced emergency contraceptive pills are currently available through medical officers only at the district and sub-district level.\(^{(37)}\)

Not only is access to a wider choice of methods limited, but providers also often do not assist women and men to exercise their right to contraceptive choice by offering them complete and accurate information on the variety of methods available. Nationally, for example, only 15% of users of modern contraceptive methods who were motivated by a health worker from the public or private sector were informed of at least one alternative method.\(^{(1)}\) Private and nongovernmental organization (NGO) health workers were more likely to inform clients of alternative methods than were public sector health workers (28% vs. 19%).\(^{(1)}\) Several small-scale studies report that most providers have a distinct bias towards sterilization and only a minority of clients are informed of reversible methods.\(^{(38-48)}\)

In spite of evidence that pre-acceptance counselling improves contraceptive continuation,\(^{(49-50)}\) counselling of clients on how the method works, what the expected side-effects are and how to manage the side-effects is typically lacking or limited in the family welfare programme. Nationally, data from NFHS-2 indicate that only 22% of users of any modern method were informed of its possible side-effects at the time of accepting the method.\(^{(1)}\) Similarly, data from the Reproductive and Child Health Survey report that only one third of sterilization users (35%), less than one half of IUD users (46%) and less than one fourth of pill users (23%) were informed of side-effects before accepting the method.\(^{(51)}\)

Research on users’ perspectives/client acceptability of methods is limited, but available evidence suggests that many of these methods are acceptable to women in rural and urban areas.\(^{(52-53)}\) Evidence is emerging that if provided with detailed information on all available contraceptive methods, women do make an informed choice overriding the provider’s bias. For example, in a study where potential clients were provided with detailed information on
various methods such as IUDs, oral pills, condoms, sterilization and Norplant, the majority (80%) opted for reversible methods, irrespective of their literacy status, and only 17% accepted sterilization.\(^{54}\)

**Limited access and availability of services**

Over the decades, there has been considerable expansion and strengthening of the health care infrastructure, and family welfare services are now an integral part of services provided by primary, secondary and tertiary care institutions across the country. Currently, approximately 137,271 sub-centres (1/4 579 population) and 22,975 primary health centres (1/27 364 population) in the rural areas, and 871 health posts and 1,083 family welfare centres in urban areas provide family planning services at the grassroots level.\(^{31}\) Access to contraceptive methods has increased significantly, and only a negligible minority of women (4% as per NFHS-2 data)\(^{1}\) perceive availability, accessibility or cost as major impediments to using contraception. Yet, in practice, access to and availability of services are significant issues of concern.

Where workers are available, they are generally poorly trained and have little knowledge of the methods they are to provide.\(^{25, 55}\) A facility survey observes that only 16% of primary health centres have physicians trained in conducting sterilization, and only two thirds have at least one paramedical staff trained in IUD insertion.\(^{32}\) While female health workers in many studies reported that they had received training in IUD insertion, the majority did not feel confident about actually inserting an IUD in field-settings or showed little awareness of the precautions to be taken.\(^{48}\) The Reproductive and Child Health Programme has laid greater emphasis on skill upgradation and gender sensitization training, and a nationwide reproductive and child health training programme has been launched to upgrade the skills of health providers and managers to deliver the package of reproductive and child health services. A mid-term review of the reproductive and child health training programme has noted that the training focuses more on the technical aspects of service delivery and gives little importance to areas such as client needs and quality of services.\(^{56}\)

Health and family planning workers are required to regularly visit households in their assigned areas to provide information related to health and family planning, counsel and motivate women to adopt appropriate health and family planning practices, and deliver other related services. However, data from NFHS-2 indicate that only 13% of women had received a home visit from a health and family planning worker during the 12 months preceding the survey and only 11% of women who were visited at home reported that they received family planning services. Women without any children were least likely to receive a home visit.\(^{1}\) State-level data show that less than 2% of women in many states including Arunachal Pradesh, Delhi, Haryana, Jammu and Kashmir, Nagaland and Punjab received a home visit from a health and family planning worker in the 12 months preceding the survey. In only four states - Gujarat, Maharashtra, Mizoram and Tamil Nadu - did at least 25% of women receive such visits. Several small-scale studies
also reveal significant shortcomings in the frequency and regularity of outreach services, the time devoted by workers to such activities and the length of time spent with clients. Additionally, outreach services were reported to be almost non-existent in remote and tribal areas. Moreover, health workers at the community level were often looked upon with distrust, and identified as interested only in recruiting ‘cases’ for family planning. The introduction of the Target-free Approach/ Community Needs Assessment Approach, however, has reportedly enabled front-line health workers to gain a more positive image in their communities.

The Reproductive and Child Health programme recommends that women who do not deliver in institutions should receive three postpartum visits during which they are to be provided with advice on family planning. Data from NFHS-2 show not only that postpartum check-ups are almost non-existent but also that family planning is given the lowest priority among the various components of postpartum care. Nationally, fewer than one in five non-institutional births were followed by a postpartum check-up. Among those who received a postpartum check-up, only 27% of mothers received advice on family planning, compared to 43% receiving advice on breastfeeding and 46% receiving advice on baby care. Adolescent mothers and women delivering for the first time were less likely than older women to receive advice on family planning. Notably, mothers received advice on family planning during postpartum check-ups for only 14% of first births, although these women are more likely to need advice on birth spacing and contraception. Clearly health workers and other providers tend to overlook adolescent and young women until they are further advanced in their reproductive careers.

Stock-outs and erratic supplies of reversible contraceptives make it unrealistic to expect providers to offer clients a choice of methods. A survey reported that only 56%-61% of primary health centres had some stocks of condoms, IUDs and oral pills on the day of the survey. The situation was worse in states like Bihar, Orissa and Uttar Pradesh where fewer than one fifth of primary health centres had some stocks of these methods.

Many new initiatives, the restructuring of existing measures, particularly those undertaken by NGOs, and some experiments with public-private partnerships have been successful in improving access to and availability of contraceptive and other reproductive health services. The social marketing and social franchising of selected reproductive health services by Janani, a registered society in Bihar, and the experience of the Innovations in Family Planning Services project in Uttar Pradesh are examples of such success.

Poor quality of services

It is now widely acknowledged that the quality of family planning services is generally poor. Little consideration is given to interpersonal interactions. Service providers tend to be insensitive and disregard women’s need for privacy. Pre-acceptance counselling or check-ups are limited, and little attention is paid to post-acceptance follow-up services. Nationally, for example, data from NFHS-2 showed that three in four
sterilization users and two in five users of other modern methods received follow-up services. The data also showed that although the quality of family planning services was far from satisfactory in all states, the quality of services was poorer in states such as Arunachal Pradesh, Orissa, Uttar Pradesh and West Bengal.

Changing the Policy and Programme Environment

The Family Planning programme in India, launched in 1951, has evolved through a number of stages and has changed its direction, emphasis and strategies. The 1990s particularly witnessed dramatic changes in the family welfare policy and programme. With the 72nd and 73rd Constitutional amendments and the passing of the Panchayati Raj and Nagar Palika Acts in 1992, the Family Planning programme was legally brought into the domain of panchayati raj institutions. In 1996, the target-oriented approach was replaced with the target-free approach, where health workers’ case-load would be determined by needs identified at the community level rather than set at the central or state level. In 1997, in order to direct the programme more towards clients’ needs, the target-free approach was recast as the community needs assessment approach, and decentralized participatory planning was brought in place. In the same year, the Reproductive and Child Health programme was launched. The Reproductive and Child Health programme espouses the principles of client satisfaction and high quality in delivering comprehensive and integrated health services.

The National Population policy, adopted in February 2000, further legitimised the shift towards incorporating quality of care within public sector services. The National Population policy provides a policy framework for achieving the twin objectives of population stabilization and promoting reproductive health within the wider context of sustainable development. The immediate objective of the policy is to address the unmet need for contraception and to provide integrated service delivery for basic reproductive and child health care. In the medium term, the policy seeks to achieve the goal of bringing the total fertility rates to replacement level by 2010 through vigorous implementation of inter-sectoral operational strategies. The National Population policy affirms the government’s commitment to the provision of quality services, information and counselling, and expanding contraceptive method choices in order to enable people to make voluntary and informed choices.

The strategies delineated in the new policies are currently under way with varying intensity and clarity in different parts of the country. It is too early to make definitive assessments about the impact of the new initiatives. However, early assessments suggest that although a decentralized, participative planning process through community needs assessment has begun, it requires considerable refinement to become effectively functional. Uncertain of the consequences of the new approach, many states continue to impose targets, setting local goals based on the previous year’s centrally assigned targets. Women’s involvement in the process of decentralized decision-making at the grass-roots has yet to
be operationalized. In many states, the involvement of the community and other stakeholders, including panchayati raj institutions, in community needs assessment is reported to be minimal.(31,68)

The Way Forward

Though the Family Planning programme has experienced significant growth and expansion over the past half century, pregnancies continue to be unplanned and the unmet need for contraception remains substantially high. Important sub-groups, such as adolescents, are neglected or underserved, the vast majority of contraceptive users are sterilized, contraceptive choice is conspicuous by its absence and quality of care is limited within the programme.

The 1990s witnessed a growing recognition of the challenges faced by the programme that led to the development of several new policy initiatives. The programme focus has shifted from vertical family planning services towards the provision of comprehensive, integrated reproductive health care. Early assessment of the impact of the new policy and programme initiatives suggests some improvements in overall indicators such as contraceptive prevalence rates and the magnitude of unmet need for contraception. However, the underlying issues including limited contraceptive choice, poor quality of services, restricted access, gender inequalities and lack of male involvement continue to plague the programme. Mechanisms to address these issues remain elusive and the strategies outlined in policies to address these core issues remain poorly implemented.

Recommendations regarding the Programme

- An expanded reproductive health programme must address men both in terms of their own health needs and in terms of their shared responsibility as partners, husbands and fathers and should not be limited to promoting the use of male contraceptive methods. The role of male health workers who could play an active role in promoting male involvement also needs to be clearly defined.

- The contraceptive needs of sexually active young people remain largely unmet. Young people, married as well as unmarried, need accurate, user-friendly information and services. Multiple entry points (education, work, sports, or other social activities) and settings (home, community, workplace, school or clinic) must be used to enhance access to information and services.

- Provider bias continues to restrict the rights of women and men in exercising contraceptive choice. The providers need to be oriented about the clients’ rights to exercise choice. Additionally, a variety of providers, including traditional medical practitioners, should be trained and engaged to promote detailed information on various contraceptive methods.

- Given that women, especially young women, are powerless and voiceless in sexual and reproductive matters, multi-sectoral activities to enhance women’s status are much needed. Since reproductive decision-making
is often beyond the control of young women and their husbands, engaging other gate-keepers including senior men and women in the family and influential people in the community is crucial.

- IEC efforts to enable clients to exercise informed contraceptive choice have been increased, but inadequate collaboration between the health sector, IEC units and other stakeholders is reportedly rendering these efforts ineffective. Hence, intersectoral coordination needs to be promoted vigorously.

- The involvement of the community in planning and monitoring remains minimal. Concerted efforts to promote community participation are needed.

- As reflected throughout in this review, there are substantial state-level variations in contraceptive prevalence, the method-mix commonly used, the extent of unmet need, the level of awareness of reversible methods, and the quality of services. This clearly highlights the importance of state-specific interventions to improve family planning services.

**Recommendations regarding Research**

- Research on the attitude and practice of men regarding fertility regulation, and the factors inhibiting their role and participation in reproductive health could help improve and modify the delivery system. Research is also required to determine men’s needs for services and information in specific communities. Operations research is required to assess how educational campaigns could be made effective to promote shared responsibilities. As methods of fertility regulation available to men are limited, priority should be given to developing male methods of family planning.

- Gaining a better understanding of how women and men make choices and negotiate trade-offs among methods could provide useful insights for policy-makers, programme managers as well as clients themselves. Future research should explore the context in which women and men exercise choice, including the power dynamics of relationships, and the interface between clients and the service system.

- Additional research is required to understand why women discontinue contraceptive use, and whether efforts to provide detailed information under the new programmes have improved contraceptive continuation rates. Similarly, explorations into whether the new rhetoric on quality of care has been translated into reality and whether it has impacted contraceptive use dynamics are critically needed.

- Apart from data from Reproductive and Child Health-2 currently under way and a few small-scale studies, detailed and in-depth insights into the impact of new initiatives are scarce. Qualitative studies are needed to assess the perspectives of primary and secondary stakeholders.
regarding the changes in the programme.

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The Changing Family Planning Scenario in India


Geographical Distribution and Utilization of Mammography in Thailand

By
Weerasak Putthasri*, Viroj Tangcharoensathien*, Suwanna Mugem*, Wongdoen Jindawatana*

Abstract

**Background:** Breast cancer is the second most common cancer among Thai women. Understanding on breast cancer screening programme in order to detect it at an early stage is crucial for the improvement of treatment outcome.

**Objective:** This study describes resource allocation (in terms of mammograms and human resources) and utilization of mammography for breast cancer screening in Thailand in 2002.

**Methods:** Data on distribution of mammogram facilities were retrieved from the Department of Medical Science, Ministry of Public Health (MoPH). A self-administered mail questionnaire survey to public and private owners of mammogram facilities was launched to assess the utilization of these mammograms. A brainstorming workshop among experts was conducted to produce standard guidelines for breast cancer screening.

**Findings:** In 2002, there were 139 facilities for mammograms in 30 out of the total 76 provinces in Thailand. Private providers owned 60%, and public hospitals the remainder. Most mammogram facilities, 50.36%, were concentrated in Bangkok, whereas the lowest 5% were in the north. The allocation indicated an inequitable distribution of mammogram facilities. For instance, for every one million females aged over 35 years, 41.8 mammogram facilities were available in Bangkok, 2.8 in the north and 4.0 in the north-east. The gap in the discrepancy index in Bangkok was 15.1 times in relation to that in the north. The nationwide index was 3.9. One crucial input of the mammography procedure is the number of radiologists. In Thailand, a total 682 radiologists were distributed in 63
provinces. However, half the number worked in Bangkok. In 2001, the utilization rates per mammogram averaged 1,082 cases per year. Private providers had a very low rate, an average of 344.73 cases per year, but some public hospitals faced high demand, along with the consequent extension in waiting time for patients. Finally, the workshop held to discuss the criteria and guidelines concluded that breast self-examination (BSE) was an important strategy to increase awareness for women aged 20+; an annual clinical breast examination (CBE) by doctors or well-trained nurses was recommended for women aged 35+, and mammography was recommended for the highest-risk women age group of 40+.

Conclusions: A national policy and guidelines should be in place in order to improve access to mammography and early detection of cancer when prognosis is good. Distribution of mammogram facilities, radiologists and the public-private mix must be managed, in order to raise the utilization rates to cost-effective levels. Mobile units might be an appropriate alternative to construction of new centres.

Key Words: Mammography, resource allocation, breast cancer

Introduction

Cancer has, from time to time, ranked as either the second or the third cause of mortality in Thailand since 1977, followed by heart diseases and accidents. In 1993, the National Cancer Institute (NCI), which is responsible for cancer prevention and control, estimated some 64,000 new cases of cancer. Three of the best-known cancers occurring in men are liver, lung and colorectal, whereas in women, the highest-occurring cancers are cervix, breast and liver. These cancers are also a significant burden on public hospitals.

The data collection of cancer incidence rates in Thailand was passive and relied upon notification from hospitals in Bangkok, Chiangmai, Lampang, Khonkaen and Songkhla. Breast cancer was the second most frequent cancer in women, after cervical cancer. The estimated incidence was 16.3 per 100,000 women, rather higher than the rate in 1990. The incidence was the highest in Bangkok, followed by Chiang mai, Lampang, Songkhla and Khonkaen, respectively. Breast cancer was very rare in Thai men. The age-specific incidence showed a rise to the maximum around the age of 50 years, with a plateau or even a small decline in risk at older ages. Changes in the population age-component and lifestyle might have led to the higher incidence of breast cancer.

Although breast cancer ranked second in Thai women and could be predicted and detected early, the concentration of treatment was on management and care systems. Breast self-examinations were and are promoted, but anecdotal observations found that Thailand performed poorly in research and prevention, including primary and secondary prevention of breast cancer. The cancer registry data revealed a high prevalence of late-stage disease at diagnosis, with 56% of patients receiving treatment at
Stages III and IV. Moreover, the majority of resources were allocated to curative care that required a lot of investment, and the poor return in benefits put a heavy financial burden on the public health system.

The poor outcome of breast cancer care was influenced by: the lack of people’s self-awareness resulting in their arrival at treatment facility at a late clinical stage; the scarcity of basic screening equipment, and the poor allocation of mammogram facilities. To improve breast cancer care and management in Thailand, it would be very useful to evaluate the feasibility of using mammography screening at the macrolevel.

“Breast screening” is a method of detecting breast cancer at a very early stage. There are three ways: BSE, clinical breast examinations (CBE), and mammography. The best time for BSE is about a week after the end of the period, when breasts are not tender or swollen. If a woman’s “periods” are irregular, she performs BSE on the same day every month. A woman or her sex partner often discovers breast lumps. Most are not cancerous, but anything unusual should be reported to a clinician as soon as possible. CBE is an examination of breasts by a health care professional, such as a doctor, nurse practitioner, nurse, or a doctor’s assistant. During the CBE, it is a good time for the health care professional to teach breast self-examination to a woman who does not already know how to examine her breasts. A mammogram is an X-ray of the breast, which is taken while carefully compressing the breast. Most women find it a bit uncomfortable and a few find it painful. The mammogram can detect small changes in breast tissue, which might indicate cancers that are too small to be felt either by the woman herself or by a doctor.

An appropriate breast cancer screening programme could improve both the recent prevalence of breast cancer and improve treatment results. Regular screening is an important preventive method in reducing morbidity and mortality from breast cancer. Unfortunately, only 37% of Thai breast cancer patients practise BSE, while 51% of them are aware of breast cancer. The majority of Thai women are unable to perform BSE from shyness. Results show that after BSE instruction, 72.27% are able to perform BSE, 1.85% are unable, and 25.95% are uncertain. Of the total participants, 49.07% practised BSE monthly and 44.44% occasionally. However, it was believed that results of the nationwide BSE programme would reflect in improvements in the 5- and 10-year survival rates of breast cancer patients in Thailand. Improvement in long-term survival depends not only on improvement of the modality of treatment but also on how early the stage is at first treatment. In a retrospective study of 1,176 breast cancer patients from 1977-1985, the incidence of early stage in each of the periods: 1977-1979; 1980-1982, and 1983-1985 were: 44.65%; 46.34%; and 59.24% respectively. The increase in cases of diagnosis in early stages at first treatment reflected the results of public education on cancer and the early detection programme.

This paper aims to assess the geographic distribution of mammogram facilities and their utilization among public and private institutes in Thailand. The
appropriateness of human resources, basic equipment allocation and utilization of mammography in screening breast cancer are also explored.

Methodology

We collected data on distribution of mammogram facilities from the Department of Medical Sciences (DMSc). The DMSc had compiled the data on Mammogram facilities in both public and private providers since 1988. For radiological safety reasons, both public and private medical institutions are required to register radiological medical devices with DMSc.

We also compiled the data from the Thai Medical Council database on the number of radiologists registered with the Council. At the same time, a self-administered mail questionnaire survey was launched to all public and private institutions having mammogram facilities. The questionnaire asked about human resources, staff workload, and utilization of mammograms for breast cancer screening for three retrospective years. The questionnaire survey was conducted from October 2001 to September 2002. Open-ended questions were allowed to depict problems in providing service and management. Finally, a workshop among key stakeholders was held on 24-25 June 2003 to set criteria and frame guidelines for national policy on early detection of breast cancer. Baseline data were presented and a small group discussion was organized. The workshop was participated by 36 experts from MoPH, National Cancer Institute, regional cancer centres, provincial hospitals and the university.

Results

1. Distribution of Mammograms and radiologists

Since 1988, 139 mammogram facilities had been installed, with 60% distributed in private hospitals and the remainder in public hospitals. The cumulative number of installed mammogram facilities increased continuously from 1988 until 1997-1998. In 1998, one year after the economic crisis, only five new machines were installed. Since 1999, however, the number of mammogram facilities has risen again, though slightly.

![Figure 1 Cumulative number of mammograms during 1988-2002, Thailand](image)

The distribution of facilities was concentrated mainly in Bangkok (50.36% of total mammograms), whereas the lowest was in the north (5.04%). For every one million females aged over 35, 41.8 mammograms were performed, 2.8 in the north and 4.0 in the northeast. As a regional comparison, if an index of 1 is assigned to the lowest ratio of mammogram to million populations in the north, the discrepancy index in Bangkok is

![Discrepancy index in this study refers to gap of difference between regions. For example, the mammograms to one million female aged 35+ in the North region was 2.8, then in Bangkok, the 41.8 mammogram per million is then 15.1 times higher than that of the North region.](image)
15.1. In other words, the gap of discrepancy index in Bangkok was 15.1 times that in the north. The nation-wide index was 3.9 (Table 1).

Mammogram facilities were distributed in only 30 provinces; the other 46 provinces were not provided with a single facility. The top three ranking provinces with mammogram facilities were Bangkok, Chonburi, and Songkhla with 70, and five machines each, respectively.

2. Equipment utilization

A structured questionnaire was distributed to all 120 hospitals where a mammogram machine was installed. The response rate was 53%; 64 hospitals returned the questionnaires. Most hospitals had one mammogram machine. Only four hospitals in Bangkok had more than one mammogram machine. Lorad, GE, and Toshiba were the most common brands of mammogram machines used by hospitals; the respective percentages of utilization were: 25.7%, 22.9%, and 11.4%. The average price of 63 mammogram machines was 3.6 million Bahts. The average user fee for public mammography service was 1,411.04 bahts. Private hospitals charged a user fee of 1,700.31 bahts; this was higher than that charged by public hospitals (p-value = 0.000).

In terms of utilization, the average case-load per annum was quite stable at 1,029, 1,022, and 1,082 cases in 1999, 2000, and 2001 respectively, with a very large range of case-loads (Table 4). The public hospital case-load was much higher than that for private hospitals.

<table>
<thead>
<tr>
<th>Table 1. Mammogram diffusion in Thailand, 2002</th>
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<tr>
<td>Region</td>
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<tr>
<td></td>
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<tr>
<td>BKK</td>
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<td>Central</td>
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<td>North</td>
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<tr>
<td>South</td>
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<tr>
<th>Table 2. Price of mammogram machines installed by type of hospital, Thailand, 2002</th>
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<tr>
<td>No. of Mammogram machines</td>
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<td>---------------------------</td>
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<tr>
<td>All providers (n=63)</td>
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<tr>
<td>Public providers</td>
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<tr>
<td>Private providers</td>
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Table 3. Mammography service fee by type of hospital, Thailand, 2002

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>S.D.</th>
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<tr>
<td></td>
<td>(Bahts)</td>
<td>(Bahts)</td>
<td>(Bahts)</td>
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<tr>
<td>All providers</td>
<td>1,411.04</td>
<td>2,500</td>
<td>400</td>
<td>478.73</td>
</tr>
<tr>
<td>Public providers</td>
<td>1,146.57</td>
<td>2,000</td>
<td>400</td>
<td>415.83</td>
</tr>
<tr>
<td>Private providers</td>
<td>1,700.31</td>
<td>2,500</td>
<td>1,000</td>
<td>364.61</td>
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Table 4. Average mammography utilization by hospital type, year, Thailand, 2002

<table>
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<tr>
<th>Utilization</th>
<th>1999</th>
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<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
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<td></td>
<td>(S.D.)</td>
<td>(S.D.)</td>
<td>(S.D.)</td>
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<tr>
<td>All providers (n=64)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of users (cases)</td>
<td>1,029</td>
<td>1,022</td>
<td>1,082</td>
</tr>
<tr>
<td>No. utilized (shots*)</td>
<td>2,091</td>
<td>2,143</td>
<td>2,713</td>
</tr>
<tr>
<td>Public providers (n=31)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of users (cases)</td>
<td>1,628</td>
<td>1,570</td>
<td>1,590</td>
</tr>
<tr>
<td>No. utilized (shots*)</td>
<td>4,121</td>
<td>3,959</td>
<td>4,762</td>
</tr>
<tr>
<td>Private providers (n=33)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of users (cases)</td>
<td>281</td>
<td>318</td>
<td>344</td>
</tr>
<tr>
<td>No. utilized (shots*)</td>
<td>513</td>
<td>643</td>
<td>705</td>
</tr>
</tbody>
</table>

* mammography shots mean number of films or positions to take radiation; users usually take four shots each.

3. Human resources

In 2002, there were 682 radiologists (403 general radiologists and 279 diagnostic radiologists) throughout the country. However, half of them worked in Bangkok. There were 63 provinces with at least one radiologist. This meant there were 13 provinces without any radiologist. The capacity of Thai postgraduate training of general and diagnostic radiologists was less than 100 per year in seven training institutes (teaching hospitals). As for main health personnel required for mammography provision including radiologists and technicians, 55 hospitals (90.2%) had full-time radiologists. Full-time technicians were available in 49 hospitals only because some hospitals used other personnel instead of trained technicians, such as nurses or trained assistants. Most part-time radiologists and technicians were in private hospitals.

2 Full-time radiologist is defined as those who work for that hospital more than 35 hours a week.
4. National guidelines on breast cancer screenings

Finally, at the workshop held in 24-25 June 2003, the main conclusions drawn were: the BSE programme was an important strategy to increase awareness for women aged 20+; CBE was recommended annually for women aged 35+; doctors or well-trained nurses were needed at primary care unit; and mammography was recommended for women in the risk category: age 40+.

Conclusions and discussion

The first mammogram machine was introduced and installed in 1968 at the National Cancer Institute. The number of machines rose significantly between 1995 and 1997. After 1997, the rate of increase of mammogram machines temporary slowed down as a result of the economic crisis, but recovered a few years later. Consequently, the rate of increase in the public sector was higher than in the private sector. Of the total 139 mammogram machines in Thailand, their distribution was concentrated in Bangkok, 50.4 percent, which changed slightly from 1999 with 112 mammograms, 54.5% in Bangkok. The discrepancy index in Bangkok was 15.1 times that in the north. The nationwide index was 3.9. Such indices showed the inequity of technology distribution. However, the data on number and distribution of mammogram machines and radiologists were collected from secondary sources. The study validity depended on official reports, which however could not indicate exactly the number of machines which were still in use or out of order.

It was quite clear that the distribution of both machines and personnel was poor. In addition, problems highlighted by radiologists or heads of mammogram units who responded to our questionnaire indicated that a well-organized system of specialized and regular maintenance of machines was required to maintain the quality of output. All categories of personnel needed continuous training to keep abreast of techniques and medical advancements. High demand for screening and limited services resulted in a long waiting time especially in the public sector, whereas most private providers seemed underutilized because of the high cost of their services, and because they are seldom covered by insurance schemes.

The Civil Servant Medical Benefit Scheme, for instance, is considered one of the most generous health benefit and insurance schemes in the country but does not cover mammography. As a result, unit costs might be high and cost recovery points would not be met. On the other hand, the observed number of shots per patient was much higher in public than in private hospitals; this might reflect the quality of services. On issues of case-load, overload and underutilization, regulations on import and distribution of machines should be implemented in both public and private sectors to encourage efficiency at the macro level. As for policy issues, it is not clear if mammography can decrease mortality rates of breast cancer since diagnosis depends on the processing of mammography and interpretation of images. Further study and randomized clinical trials to determine effectiveness and costs in are needed.
In addition, the barriers to access to mammography should be studied from the patient's point of view, such as awareness and mammography fees, as well as psychological and cultural barriers, such as fear of cancer, fatalistic views on cancer, and culturally-based embarrassment. Positive cues to undergo screening include physicians recommendation, community outreach programmes with the use of lay health leaders and use of culture-specific media. From the provider's side, such issues as overloaded capacity in some providers but underutilization in other providers and break-even point of services should also be explored.

It is not very difficult to rapidly improve the maldistribution of mammogram machines to match the provincial prevalence. A group of neighbouring provinces could share one mammogram machine through efficient referrals. However, it is quite difficult to re-allocate human resources especially radiologists. This requires long-term human resource planning. We recommend improving the current under-utilization of private mammogram facilities, through the purchase of services by public insurance schemes. Increase in public awareness on breast cancer would promote BSE and CBE and ensure early detection and better outcome of breast cancer treatment.

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Impact of Women Health and Nutrition Entrepreneurs and Mobilizers on Health and Nutrition of Rural Children and Mothers’ Knowledge and Health-related Practices.

By

Abstract
To improve the health care outreach in villages, an experiment was carried out in five non-Integrated Child Development Scheme (ICDS) villages (total population 4,400) of the Narsapur Mandal of Medak district of Andhra Pradesh (AP). Local women (one per village) with an education level equivalent to seventh grade, were trained in aspects of preventive and curative health care, and nutrition. These women advise the community, particularly women, on health, nutrition, sanitation and family planning. They register all pregnant women, ensure antenatal check-up, compliance with taking of iron folic acid tablets, record blood pressure, identify at-risk pregnant women and treat minor ailments for which the community pays them. Records of deaths with age and cause, and births with birth weight (wherever possible) are maintained. ‘Dais’ (traditional birth attendants) are also being trained so that both groups of women can work in tandem. While no monthly stipend is paid, a daily wage is given for days of training and small incentive money of Rs. 5/- for each vital event reported.

The positive outcomes after three years were: remarkable improvement in mothers’ knowledge of nutrition, and practices related to maternal diet, and child feeding; increase in institutional deliveries; reduction in perinatal and neonatal mortality, (infant mortality also declined after three years), and reduction in morbidity and in the incidence of vitamin A deficiency (Bitot’s spots) in preschool children. There was only marginal improvement in child nutrition, and no improvement in the incidence of low birthweight, which was around 20%.

Key words: Health and nutrition entrepreneurs, maternal and child health and nutrition, infant mortality, morbidity in children, nutrition status-child, nutrition knowledge-mother.

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Introduction

Despite a vast network of primary health centres and sub-centres, health care outreach in rural areas of India is unsatisfactory. The Community Health Workers' model has been tried internationally with varying degrees of success\textsuperscript{1-6}. One criticism of this model is its poor sustainability due to creation of a separate cadre of stipended workers. Jajoo\textsuperscript{3} has reported a programme, which overcame this problem through a village-level health insurance scheme in which the families pay for health workers as well as for primary health care and medicines by contributing the local crop, sorghum to a common pool. The participants get subsidized health care at the Sevagram Hospital in Wardha, which receives government funding.

In a study on health problems and `health care seeking practices of women', conducted by the Dangoria Charitable Trust, in five villages with no ICDS (total population 4 400) of Narsapur Mandal of Medak district in the South Indian State of Andhra Pradesh, most women reported consulting private practitioners in the block ('mandal') headquarters at Narsapur. They preferred paying these doctors, rather than receiving free treatment at the government Community Health Centre at Narsapur. The reason mentioned was “better service offered by private practitioners". O n discussion with the community, it was realized that they were willing to have one of their women trained and to pay her for her services if they were satisfied. They were unhappy when told that the trained women would not be allowed to give injections, nor would they receive free drugs. But they accepted these terms, when it was explained to them that this was not a government-supported programme and that the Health and Nutrition Entrepreneurs and Mobilizers (HNEMs) were not receiving any stipend.

In response to the community's interest, the Dangoria Charitable Trust (DCT) initiated a programme of training local women as Health and Nutrition Entrepreneurs and Mobilizers (HNEM) ('arogya karyakartas') in five villages- one per village in 1998. While four of the selected villages were from the earlier survey, one of the villages had to be replaced with another comparable village, where a health worker could be identified for training. A baseline survey was done for that village as well. Local ‘dais' (traditional birth attendants) are also being trained, so that both groups of women can work in tandem. The focus is on maternal and child health. While no fixed stipend is paid except when women come for training to the centre, the HNEM charges for the cost of drugs from her kit with an extra 1-2 rupees for her services. Advice to pregnant women and mothers is given free. In addition to delivering preventive and curative health care, the HNEMs record all deaths with age and cause, and births with birthweights where possible. For this reporting, a small incentive of Rs 5/- per case is paid. For family planning motivation, Rs 10/- is paid. The payment was initially made out of project funds, but now DCT makes the payment. Sometimes the patients ask one of the HNEMs to accompany them to the doctor, and for that they may or may not pay her. The impact of this model of health care delivery is discussed in this paper.
Methodology

HNEM's training and functions

The HNEMs are adult women, permanent residents of the village with a minimum of seven years of schooling. Due to very low levels of female literacy (10%), it was not possible to find women with even 10 years of schooling in three out of the five villages. All the HNEMs are from families, which are below the poverty line. One scheduled cast woman and one Muslim woman are from landless families, while the other three women have 2-3 acres of dry land with a borewell which works intermittently. All except the Muslim woman are married and have one or two children. They have accepted to undergo training and do this work because it gives them prestige in the village besides helping the community. Each day that they come for training, they recite a pledge of doing this work honestly and sincerely, without any discrimination on the basis of cast or creed and without expectation of monetary reward.

The HNEMs received intensive training for two months on aspects of health, hygiene and nutrition (theory and practice), including conduct of safe deliveries, at the DCT hospital in Narsapur. This was followed by contact training- twice a week for 10 months, and twice a month for one year. The once-a-month contact training is continuing. The women bring their records of registered pregnant women, births and deaths during these visits. On-site training was also given for a year during the visits of the doctor to the villages. The DCT staff continue to make unannounced visits to villages, to reassure the community and the workers, and also assist with holding of meetings with mothers and answering the queries from the community.

After one year of training, the HNEMs were given a medical kit, which included a blood pressure apparatus, a stethoscope, a thermometer, first-aid kit, and essential drugs, and were allowed to work in the village. The cost of the first supply of drugs was met from project funds, but the subsequent replenishments are being made by the HNEMs. A detailed guide for dispensing of drugs was provided in the local language. A baby-weighing balance was provided to measure the birth weight on day one or on day seven when the body weight approximates the birth weight. More recently, the second day weight is also included to improve the coverage.

The HNEMs register all pregnant women, and advise them on antenatal care, and maternal and child nutrition. At-risk pregnancies and other cases are identified and referred. They assist the multi-purpose health worker (MPHW) who visits the village once a month, with immunization, and the ‘dais’ with deliveries conducted in the village. Three workers have learnt to conduct deliveries on their own. They also motivate people for institutional deliveries and family planning. Only the terminal method of family planning (tubectomy) is popular in this community.

Not being paid workers, no specific demands on their time in terms of fixed hours of work are made. They adjust their time depending on the workload - preventive and curative care, record of vital events,
Impact Assessment

The impact of the project was assessed by studying the process (functioning of the HNEMs and their acceptance by the community), as well as by the outcome. The latter included: (i) Knowledge, Attitude and Practice (KAP) survey of mothers regarding health and nutrition, before initiation of the project and three years later using pre-tested, structured schedule; (ii) nutrition status of preschool children as judged by the weight for age classification of the Indian Academy of Paediatrics (currently being adopted by the ICDS), and signs of vitamin A deficiency (Bitot’s spots); (iii) morbidity among preschool children during alternate, monsoons; (iv) number of institutional deliveries, and (v) peri-natal, neonatal and infant mortality. Morbidity and mortality surveys were continued beyond the three-year period of project funding by the Science and Society Programme of the Department of Science and Technology, Government of India.

Morbidity survey was done during monsoons in alternate years (1998, 2000, 2002), by interviewing the mothers/family during the first week of July, August and September, using a simple pre-tested, coded questionnaire. The reference period was 15 days. Mothers were asked if during the previous 15 days the child had suffered from any of the following: gastrointestinal disorders (diarrhoea, dysentery, vomiting) and its duration in days, respiratory infections (cough, cold and fever), skin ailments (scabies, rash, boils, measles, chickenpox). Information was also obtained on feeding during diarrhoea, doctor consulted, and treatment given. Reliable data on frequency of motions, which varies with each day, could not be obtained.

Data on morbidity and mortality continued to be obtained even after three years.

Statistical analysis

Data on KAP of mothers were analysed by proportions test (since there were only two groups), while that on morbidity were analysed by the Chi-square test since there were more than two groups.

Results

Process evaluation

Rural women with seven years of schooling are able to understand the causes of diseases, do symptomatic diagnosis of common ailments, and treat minor ailments using listed drugs for which a detailed user guide in local language is provided. They are able to identify at-risk cases of pregnancy deliveries, assistance to MPHW, referrals etc. Specific criteria of impact assessment for judging the performance of HNEMs are discussed later.

‘Dai’ training: ‘Dai’ training was for a period of one week, followed by periodic contact training for one or two days. In addition, four-five women belonging to different ‘bastis’ (localities) in each village were sensitised on issues of health and nutrition, so that they could help the HNEMs in mobilizing the community. ‘Dais’ were provided with delivery kits.
including blood pressure measurements, and some other illnesses for referral, and assess the stage of pregnancy through abdominal examination.

In the survey covering mothers with preschool children, conducted after three years of the programme, 98% mothers were aware of the HNEMs in their village, and 70% had consulted them for minor ailments such as respiratory infections (27.7%); diarrhoeas (24.1%); body ache and pain (29.1%); reproductive and pregnancy-related issues (24.1%), and others including first aid (7.7%). Most (95%) were satisfied with an HNEMs treatment (though a few complained about not getting injections and free drugs), and 96% reported paying her for her services. Eighty four per cent said that she had advised them regarding antenatal care and nutrition. Out of the five HNEMs, three are able to conduct deliveries independently in the village, but others assist the ‘dais’. So it appears that the community has accepted the HNEM and utilize her services.

Outcome- KAP of mothers

Table 1 shows that at the end of three years more mothers reported increasing their food intake during pregnancy and lesser numbers reported eating less during pregnancy. Food taboos such as avoidance of papaya, and banana during pregnancy also came down substantially. The number of infants who received breast milk from the first day, as well as those who received complementary food before nine months (mostly between six-nine months; two-three reported starting by four months) increased markedly.

Table 1. Health-and nutrition-related practices among mothers with pre-school children in Medak district of Andhra Pradesh, India 1997 and 2000

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Initial-Winter 1997 (% respondents)</th>
<th>Final-Winter 2000 (% respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>289</td>
<td>220</td>
</tr>
<tr>
<td>Food consumed during pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More food (than usual)</td>
<td>12.5</td>
<td>43.2*</td>
</tr>
<tr>
<td>Less food</td>
<td>54.7</td>
<td>7.3*</td>
</tr>
<tr>
<td>Same quantity</td>
<td>32.9</td>
<td>49.1*</td>
</tr>
<tr>
<td>Pregnancy food taboos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiation of breast-feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 1 within 24 hours</td>
<td>16.6</td>
<td>59.5*</td>
</tr>
<tr>
<td>Day 2</td>
<td>14.9</td>
<td>5.5*</td>
</tr>
<tr>
<td>Day 3</td>
<td>68.5</td>
<td>34.1*</td>
</tr>
<tr>
<td>Complementary feeding between 4-9 months</td>
<td>39.6</td>
<td>60.0</td>
</tr>
<tr>
<td>Massive dose vitamin A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 dose</td>
<td>22.5</td>
<td>24.1</td>
</tr>
<tr>
<td>2 doses</td>
<td>32.2</td>
<td>51.4*</td>
</tr>
<tr>
<td>Immunization done more than three times - Polio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPT</td>
<td>85.8</td>
<td>93.5**</td>
</tr>
<tr>
<td>Measles</td>
<td>61.6</td>
<td>80*</td>
</tr>
<tr>
<td>BCG</td>
<td>91.7</td>
<td>95.9</td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td>5.5</td>
</tr>
</tbody>
</table>

*P< 0.001; **P< 0.01 by proportion test
Immunization coverage (DPT, polio) was over 80% initially and increased to 93% at the end of three years. Now it is almost complete. Immunization for measles also increased from 61% to 80%. Only few mothers reported giving hepatitis vaccine, because of the cost. In the initial survey only 32.2% infants had received the recommended two massive doses of vitamin A during the previous year. This percentage increased to 51.4% in the survey done three years later. Some children (22% and 24% respectively in the two surveys) had received only one dose of vitamin A. The percentage of households who grew β carotene-rich fruits and vegetables in their home gardens or farms increased from 52.3% initially to 82.3%. Mothers said that they used these fruits and vegetables for their homes. Most mothers usually feed their children with the food cooked for the family, sometimes making necessary modifications, such as making softer rice, and cooking lentils and vegetables without chillies for infants.

In general, the mothers’ knowledge about the causes of diseases, other than diarrhoea was poor. While 50% mothers knew the cause of diarrhoea, they were unable to describe the symptoms of dehydration. Most (96%) mothers breast-fed their infants during diarrhoea, and 80% gave oral rehydration with fluids such as sago gruel (73.6%); sugar-salt solution (66.6%); ORS (30.3%); tea (27.8%); rice water (17.9%), and ‘dal’ (lentil) water (6.5%).

While over 70% mothers in the final survey reported washing the vegetables before cutting, the adverse practice of discarding excess rice water after cooking the rice persisted in over 60% households despite repeated advice against this practice.

**Malnutrition in preschool (six months to 60 months) children**

Children in the age group 6-24 months tended to be more malnourished (moderate and severe grades of malnutrition) in the initial survey. Some improvement in their status was seen at the end of three years but the difference was statistically not significant (Table 2). However, the overall reduction in moderate and severe malnutrition was only marginal being 20.0 % initially and 17% at the end of three years. (Table 2). The incidence of Bitot’s spots decreased from 4.5% to 2.3 %.

**Table 2.** Moderate and severe grades of malnutrition in pre-school children in Medak district, Andhra Pradesh, India 1997 and 2000

<table>
<thead>
<tr>
<th>Year</th>
<th>1997</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Total</td>
<td>289</td>
<td>20.0</td>
</tr>
<tr>
<td>&lt; 24 months old</td>
<td>145</td>
<td>25.5</td>
</tr>
<tr>
<td>&gt;= 24 months old</td>
<td>144</td>
<td>14.6*</td>
</tr>
</tbody>
</table>

Significantly lower than < 24 months, $P < 0.05$, by proportions test

**Morbidity among preschool children**

Tables 3 and 4 show that morbidity (GI disorders, respiratory infections-cough, cold and fever, and skin ailments-scabies, boils, etc.) as judged by the percentage of prevalence during the two-weeks period prior to interviewing the mother, tends to be high at the onset of monsoon - July and then comes down. The Morbidity prevalence showed a declining trend over the five-years
period. Table 3(a) shows some reduction in the duration of diarrhoea. Since getting reliable information on the frequency of motions is difficult, that data is not reported.

Antenatal check-up and institutional deliveries

In the final survey, almost all mothers reported having undergone at least one antenatal check-up the distribution being: more than three check-ups: 91%; three check-ups: 1.9%; two check-ups: 3.7%, and one check-up: 2.8%. Almost all the mothers (99%) had received TT injections. The percentage of institutional deliveries increased from 37.4% in 1997-1998, during the baseline survey, to 46.5% in 1998-1999; 53.3 in 1999-2000; 49.5% in 2000-2001; 68.2% in 2001-2002; 59% in 2002-2003, and 61.9 during 2003-2004. Almost 90% institutional deliveries were in private institutions. The main reason for the home delivery is the medical cost in private institutions and lack of faith in the government hospital (Community Health Centre), which is free. Transportation problem used to be quoted earlier, but not now since all villages have autorickshaws, which can be hired.

Birth weight

Birth weight could be recorded in only 45%-50% of the cases, where the deliveries took place in the study village, or at the Dangoria Hospital. Most hospitals including the government hospital do not record birth weight. Many deliveries took place in other villages since daughters often go to their parental homes for delivery. Most birth weights were recorded on the day of delivery. Few infants, who were missed, were weighed on day seven since earlier reports showed that after initial loss, body weight tends to approach the birth weight between days 5-10. The percentage of infants born with low birth weight (<2.5Kg) varied between 18.5 and 22.3. Though this average is lower than the national average of 30%, there was no improvement over the five-year period.

**Table 3. Morbidity during monsoon in pre-school children. Percentage of children who suffered during previous 15 days, Medak district, Andhra Pradesh, India, 1998-2002**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>221</td>
<td>268</td>
<td>245</td>
<td>219</td>
<td>278</td>
<td>250</td>
<td>233</td>
<td>279</td>
<td>236</td>
<td>673</td>
<td>825</td>
<td>731</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>47.5</td>
<td>18.3</td>
<td>8.6</td>
<td>25.6</td>
<td>7.9</td>
<td>8.8</td>
<td>11.6**</td>
<td>6.1**</td>
<td>7.6</td>
<td>27.9</td>
<td>10.7</td>
<td>8.3°</td>
</tr>
<tr>
<td>Respiratory infections</td>
<td>78.7</td>
<td>58.6</td>
<td>34.7</td>
<td>50.7</td>
<td>42.8</td>
<td>16.0</td>
<td>47.2°</td>
<td>41.2**</td>
<td>10.0</td>
<td>58.7</td>
<td>47.6</td>
<td>19.2°</td>
</tr>
<tr>
<td>Skin infections</td>
<td>19.0</td>
<td>3.0</td>
<td>5.1</td>
<td>9.6</td>
<td>3.2</td>
<td>4.8</td>
<td>7.3°</td>
<td>1.1</td>
<td>0.4°</td>
<td>11</td>
<td>2.4</td>
<td>3.8°</td>
</tr>
</tbody>
</table>

** p< 0.001; *p< 0.01 between months in a given year; by Chi-square test. @-P< 0.01 between years, by Chi-square test.
Perinatal, neonatal and infant mortality

Table 5 and Figure 1 show a marked decline in perinatal mortality. Neonatal and infant mortalities show a transient increase but a subsequent decrease. Maternal factors associated with these early infant deaths are being investigated in a separate retrospective study.

Maternal deaths

Over the six-year period there were three maternal deaths. Two of these women had been away from the study village during their pregnancy and had come just a month before their delivery to their mothers’ home. They died of toxaemia (high blood pressure and fits). One woman was epileptic and died in fits.

Table 4. Duration of diarrhoeal diseases; percentage of children, Medak district, Andhra Pradesh, India, 1998, 2000 and 2002

<table>
<thead>
<tr>
<th>Days of diarrhoeal disease</th>
<th>1998</th>
<th>2000</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>0.8</td>
<td>0.7</td>
<td>0.1</td>
</tr>
<tr>
<td>Two</td>
<td>5.1</td>
<td>2.8</td>
<td>4.8</td>
</tr>
<tr>
<td>&gt;= 3</td>
<td>26.8</td>
<td>10.5</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Table 5. Perinatal, neonatal and infant mortality, Medak district, Andhra Pradesh, India, 1998/99 to 2003/04

<table>
<thead>
<tr>
<th>Event/year</th>
<th>1998/99@</th>
<th>1999/00</th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total deliveries</td>
<td>88</td>
<td>124</td>
<td>99</td>
<td>126</td>
<td>105</td>
<td>86</td>
</tr>
<tr>
<td>Institutional deliveries (%)*</td>
<td>41 (46.5)</td>
<td>66 (53.2)</td>
<td>49 (49.5)</td>
<td>86 (68.2)</td>
<td>59 (56.2)</td>
<td>52 (60.5)</td>
</tr>
<tr>
<td>Livebirths</td>
<td>82</td>
<td>124</td>
<td>98</td>
<td>124</td>
<td>105</td>
<td>85</td>
</tr>
<tr>
<td>Stillbirths</td>
<td>6</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Deaths &lt; 7 days</td>
<td>4</td>
<td>12</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>7-28 days</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>28 days - 1 year</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>1-6 years</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

@ Data from June 1998 to March 19999 * During 1997/1998, there were 37.4 institutional deliveries
Acceptance of family planning

In the initial survey 31.6% mothers had undergone tubectomy- the only method of family planning used. In the survey done three years later, the percentage increased to 41.4%. The women adopted no other family planning method. The unmet family planning need as judged by the percentage of women who wanted to adopt family planning but could not do so due to pressure from elders or their husbands, or difficulties like no one to take care of home and look after the children, increased from 10.7% to 15.5%.

General observations

While the HNEMs interacted with the mothers individually or in small groups, they lacked the confidence to call mothers’ meetings or organize cooking demonstrations on their own. The project staff had to help them with these activities.
One of the HNEMs was from the scheduled caste community, and the other a Muslim woman, but the higher hosts from cast Hindu families utilized their services, which was a matter of pride for them. Right from the beginning, the HNEMs were told that they were serving the community and may not earn much money. They accepted this and sometimes let go the charge for inexpensive drugs if the patient was poorer than them. Initially, the HNEMs kept many drugs including antibiotics, but later they kept only a few less-expensive ones of common use for dispensing and advised the patients to buy the others from the market.

The rapport between the HNEMs and the dais was good. The dais helped the HNEMs in identifying pregnant women, advised the mothers on antenatal care and made sure that breast-feeding was initiated on the day of the delivery if not within one hour. If the HNEM was away, the dais recorded the birthweight with the help of some educated person. Sometimes the mother-to-be asked the HNEMs to be present during the delivery conducted by the dai. In one of the villages, the HNEM though most intelligent of the group, tends to feel shy of reaching out to the community. Besides she has two small children and finds it difficult to go out of the house. The dai encourages the community to consult her and take her advice. She also acts like a big sister and scolds the concerned HNEM for not being bold.

Discussion

The HNEMs are a human resource for the village. They continue to perform their domestic and economic activities like farming for self or working as wage labourers. While no fixed hours of work are demanded from them, they know their responsibilities and allocate time as needed. They do their job sincerely. This is a low-cost model of health care delivery in villages. However, institutional support (private or government hospital, health centre) and continuing education are necessary for a grass-roots health workers’ programme to succeed. In all villages, the selected women were the only educated women, who were permanent residents (daughters-in-law) and willing to undergo training and work as health workers. In some of the villages there were couple of upper-class, educated and relatively better-off women, but they refused to undergo training and work as HNEMs.

One of the limitations of the present study is small coverage—only five villages (population around 4400). Many women move during pregnancy from their husbands’ homes to parents’ homes and vice versa, which may be outside the study area. Better impact of the health workers’ intervention would be possible if the captive area was larger and there were no escapees during pregnancy. This model has the potential of being replicated through the ICDS. Since the ‘anganwadi’ workers (AWW) in ICDS are already trained in some aspects of maternal and child health and nutrition, additional sound training in symptomatic identification of common diseases, at-risk cases, their causes, prevention and treatment would be needed to enable them to function as health workers. Alternatively, a separate HNEM can play a complimentary role and fill in the gaps in services extended by the AWW.

Private non-profit organizations, which do not receive any support from government,
can also adopt this model, though some financial inputs for giving the stipend during the training programme and supply of medical kits initially would be required. Some financial support towards payment of incentive money for recording deaths and births would also be required. It may be advisable to have two trained workers per village, so that if one goes away the other is still available. Recording of birth weight should be made mandatory for all institutions - both government and private.

The observed improvement in mothers' knowledge of health and nutrition, particularly the latter, is encouraging. This however was not reflected adequately in child nutrition though some improvement in moderate and severe malnutrition in children 6-24 months old was seen. The degree of malnutrition in children seen in this study is comparable to the values reported recently for Andhra Pradesh\textsuperscript{10}. Though maternal awareness is important, constraints of access to and affordability for nutritious diet, have to be addressed if maternal and child nutrition have to improve. In the present study most mothers were below the poverty line, illiterate and engaged in farm work, and hence further analysis correlating socioeconomic factors with child nutrition could not be carried out.

The small sample size prevents definite pronouncements regarding infant mortality, but declining trends in perinatal, neonatal and infant mortality are apparent (Figure 1). The transient increase in neonatal and infant mortality may be due to saving of weaker infants at the perinatal stage, particularly reduction in still births (Table 3, Fig.1). Andhra Pradesh has the dubious distinction of highest infant mortality among the southern states of India\textsuperscript{11,12}. The relatively high infant mortality figures (except during the last year 2003-2004), despite the fact that almost 90% mothers had undergone more than three antenatal check-ups, and had received TT injections, iron folic acid tablets and advice on diet, shows that the problem is complex. The maternal factors associated with perinatal and neonatal mortality in this community are being investigated. Effective implementation of the ICDS with the component of supplementary feeding for mothers may help. The selected villages do not have the ICDS. Most mothers in this community drink ‘toddy’ (fermented palm juice mixed with stimulant drugs) daily. The effect of this on pregnancy outcome needs to be examined. Since most surrounding villages are covered by the ICDS, it was not possible to include/control non-intervention villages. The credit for good immunization coverage must go to the efforts of the state government.

The reduction in morbidity among preschool children is also encouraging. Apart from the role of HNEMs in advising on hygiene, the pre-monsoon anti-diarrhoea campaign conducted by the DCT, in these five and other villages, with the help of students in the village, through handbills may also have contributed. The reduction in respiratory infections without specific intervention may partly be due to relatively drier monsoons during 2001 and 2002. Surprisingly, pneumonia is rarely seen and is not the major cause of infant deaths as it is in some communities.

While DCT continues to support the HNEM project in the five villages, the
possibility of replicating this model through the ‘Velugu’ scheme of AP government, is being explored. The aim of the ‘Velugu’ project is to reduce poverty among the poorest of the poor, improve the health and nutrition status through a trained grassroot worker, and to effect better health care outreach.

Acknowledgements

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References

Noncommunicable Diseases

Prevalence of Hypertension in Two Selected Villages of Kayin State, Myanmar

By
San Shwe†, Ohnmar‡, Kyu Kyu Than§, Than Tun Sein**‡, Aung Thu†,
Khin Maung Maung***, May San Lwin***, and Hnin Lwin Tun***

Abstract
The objective of this study was to determine the prevalence of hypertension among the 15-years-or-above population in Ta-Yoke-Hla (TYH) and Myaning-Ga-Lay (MGL) villages in Kayin state. During the cross-sectional survey conducted in November 2001, 753 respondents (370 in TYH and 383 in MGL) were interviewed. Weight, height, waist circumference and hip circumference were measured for calculation of body mass index (BMI) and waist-hip ratio. Of them, 108 (54 with hypertension and 54 with normal blood pressure) were examined for serum cholesterol and high density lipoprotein (HDL) level. The overall percentages of hypertension (systolic $\geq$ 140 mmHg and diastolic $\geq$ 90 mmHg) were: 22.4% for both townships; 17.3% in TYH; 27.4% in MGL; 18.7% among males, and 24.5% among females. The respective percentages of hypertension among different age groups (15-24 years, 25-39 years, 40 or above) were: 5.5%; 12.7%, and 38.1% for both townships; 3.8%; 11.3%, and 31.3% in TYH; 7.6%; 14.0%, and 43.7% in MGL; 3.9%; 13.2%, and 30.7% among males, and 6.5%; 12.4%, and 42.4% among females. Sixteen (2.1%) persons reported previous history of stroke. Biochemical levels and other known factors associated with hypertension are also described in the study. Health education should include among others, education on taking treatment for hypertension regularly.

Introduction
Hypertension, or high blood pressure, is the most common cardiovascular disorder affecting 20% of adult population worldwide. It is also an important public health problem of global dimensions, both in the developed and developing world. Based on the cut-off values of hypertension ($\geq$140 mmHg for systolic blood pressure and $\geq$ 90 mmHg for...
diastolic blood pressure regardless of the age), the prevalence of hypertension ranges from 8% to 18% among adults in many parts of the world. According to a previous cardiovascular diseases survey, the prevalence of hypertension was 12.4% for rural areas and 14.5% for urban areas\(^2\). Considering the lack of information, national interest and budget limitation, this small-scale study was carried out to determine the prevalence of hypertension among people aged 15 years or above and to explore dietary habits, BMI, waist-hip ratio, and the biochemical levels of people with or without hypertension in selected villages of Kayin state.

**Methodology**

The villages selected in the study were three miles away from the city, Pa-An of Kayin state. Before starting the cross-sectional survey, the list of all people in the age group 15 years and above currently living in the selected villages (790 people) was developed with the help of local authority and used for recruitment. Those who were working in other places were not included in the list. The non-response rate was about 10%. During the survey, around 5% of respondents, who were not in the list, were recruited during their temporary stay in TYH for a village development project. Such respondents included construction workers, teachers, Red Cross members and students. After taking verbal informed consent, a total of 753 (370 in TYH and 383 in MGL) people were examined and 108 (54 with hypertension and 54 with normal blood pressure) were tested for serum cholesterol and HDL level. Medical officers measured the blood pressure by using standardized sphygmomanometers. Firstly, all were requested to rest for at least 10 minutes before blood pressure measurement in a lying down position. This procedure was repeated one minute after the first measurement. Next, a face-to-face interview was conducted using a structured questionnaire. Then, body weight, height, waist circumference and hip circumference were measured using standard measuring procedures. After that, each person was included in one of the following lists:

- Systolic and diastolic hypertension with no prior anti-hypertensive treatment within two weeks;
- Normotension with no prior anti-hypertensive treatment within two weeks;
- Systolic or diastolic hypertension only, and
- Those with prior anti-hypertensive treatment regardless of current blood pressure level.

Finally, the people selected randomly from out of list (i) or (ii) were requested for their blood samples. The walk-through observation in villages and informal group discussion with eight women using guidelines were carried out with particular emphasis on dietary habits.

**Informed consent**

Ethical approval for conducting this study which involved humans as subjects was obtained from the Institutional Ethical Review Committee, Department of Medical Research, Lower Myanmar. Informed consent
was taken in Myanmarese language. Before participation in the study, informed consent was taken from respondents by trained research assistants from the Department of Medical Research using the prepared consent form. Respondents were briefed on the purpose and procedure, including the taking of 5cc blood samples from randomly-selected respondents. The contents of the consent form made the following points clear: (i) that the participation was on a voluntary basis; (ii) the right to ask questions up to the respondent's satisfaction; (iii) the possibility of psychological annoyance in answering some questions, and (iv) the right of respondents to withdraw from the study at any time without affecting their future health care. Respondents were also informed that they could participate in the study without having to give their blood samples. Consents were given by respondents verbally rather than in writing because village people were found to be culturally reluctant to sign. Measurements for blood pressure, height, weight, waist circumference and hip circumference were taken in separate rooms having opaque curtains by examiners of the same sex as the respondents. Although names of the respondents were documented during recruitment using the sampling frame, the name of the respondent was not written on the questionnaire form to ensure confidentiality. The interview was carried out in privacy. Blood samples were taken at a separate place in the end. Out of the 108 randomly-selected respondents for the purpose of blood samples, two refused to give their blood samples and were replaced with the persons next on the list, and the same procedure of taking informed consent was carried out. The principal investigator provided the initial drug treatment including avoidance of high salt diet to those with high blood pressure and referred them to the local health assistant for future blood pressure examination. A packet containing 10 tablets of multivitamins was given to each respondent.

Analysis

EPI-Info version 6.04 was used for double entry and validation of data and Stata version 6 was used for data analysis. Criteria of systolic blood pressure 140 mmHg and above, and diastolic blood pressure 90 mmHg and above, regardless of the age of the respondent were used for recording the hypertension status. The percentages of hypertension for different age groups, areas and sex were calculated. The BMI and waist-hip ratio were calculated. Pregnant women were excluded from calculations of the waist-hip ratio. Odds ratio were calculated for some variables of interest. Although logistic regression analysis was attempted for hypertension status, the modelling was not good enough to be included in the findings. Content analysis was done using field notes and the notes taken during informal discussions.

Results

Findings of the structured interview survey

Background characteristics

Of the total, 268 (35.6%) were males and 485 (64.4%) were females. The ages of respondents ranged from 15 to 82 years. The mean age was 36.6 ± 15.7 in TYH; 39.9 ± 16.6 in MGL; 38.1 ± 17.7 for males, and
38.3 ± 15.4 for females. The median of monthly family income (in kyats) was 15,000 in TYH and 10,000 in MGL. The illiteracy rate was 10%.

**Hypertension and stroke**

The percentages of hypertension (systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg) were 22.4% for both townships; 17.3% in TYH, and 27.4% in MGL. Hypertension among different age groups (15-24 years, 25-39 years and 40 or above) were higher in MGL (7.6% vs 3.8%; 14.0% vs 11.3%; 43.7% vs 31.3%) than in TYH (Table 1). The prevalence of hypertension was higher among females than males (Table 2). Systolic hypertension was 3.5% and diastolic hypertension was 11.3% among total respondents, regardless of the history of having taken any anti-hypertensive drugs within the last two weeks (Table 3). Of all respondents, 16 (2.1%) reported a previous history of stroke. The age for a first-time stroke ranged from 29 to 61 years (Mean 42.5 ± 9.4).

**Table 1.** Percentages of hypertension (systolic ≥ 140 and diastolic ≥ 90 mmHg) by different age groups in the two selected villages, Myanmar, 2001

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>TYH</th>
<th>MGL</th>
<th>TYH + MGL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>%</td>
<td>Sample size</td>
<td>%</td>
</tr>
<tr>
<td>15-24</td>
<td>104</td>
<td>3.8</td>
<td>79</td>
</tr>
<tr>
<td>25-39</td>
<td>115</td>
<td>11.3</td>
<td>114</td>
</tr>
<tr>
<td>40 &amp; above</td>
<td>151</td>
<td>31.3</td>
<td>190</td>
</tr>
</tbody>
</table>

**Table 2.** Percentages of hypertension (systolic ≥ 140 and diastolic ≥ 90 mmHg) among males and females by age groups and by villages, Myanmar, 2001

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Males</th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample size</td>
<td>Number (%)</td>
<td></td>
<td>Sample size</td>
<td>Number (%)</td>
</tr>
<tr>
<td>15-24</td>
<td>76</td>
<td>3 (3.9)</td>
<td></td>
<td>107</td>
<td>7 (6.5)</td>
</tr>
<tr>
<td>25-39</td>
<td>68</td>
<td>9 (13.2)</td>
<td></td>
<td>161</td>
<td>20 (12.4)</td>
</tr>
<tr>
<td>40 &amp; above</td>
<td>124</td>
<td>38 (30.7)</td>
<td></td>
<td>217</td>
<td>92 (42.4)</td>
</tr>
</tbody>
</table>

**Village**

<table>
<thead>
<tr>
<th>Village</th>
<th>TYH + MGL</th>
<th>TYH</th>
<th>MGL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>268</td>
<td>136</td>
<td>132</td>
</tr>
<tr>
<td>Number (%)</td>
<td>50 (18.7)</td>
<td>16 (11.8)</td>
<td>34 (25.8)</td>
</tr>
</tbody>
</table>

*For respondents 15 years and above*

**Table 3.** Percentages of different types of hypertension among both males and females in the two selected villages, Myanmar, 2001

<table>
<thead>
<tr>
<th></th>
<th>TYH</th>
<th>MGL</th>
<th>TYH + MGL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>370</td>
<td>383</td>
<td>753</td>
</tr>
<tr>
<td>High Systolic + Diastolic (%)</td>
<td>17.3</td>
<td>27.4</td>
<td>22.4</td>
</tr>
<tr>
<td>High Systolic only (%)</td>
<td>3.0</td>
<td>3.9</td>
<td>3.5</td>
</tr>
<tr>
<td>High Diastolic only (%)</td>
<td>11.9</td>
<td>10.7</td>
<td>11.3</td>
</tr>
<tr>
<td>Normotension (%)</td>
<td>67.8</td>
<td>58.0</td>
<td>62.8</td>
</tr>
</tbody>
</table>
Personal habits (smoking, alcohol and toddy palm juice)

The percentages for personal habits for both males and females in the three age groups were: 34.13%; 53.7%, and 23.3% respectively for smoking; 18.19%; 47.0%, and 2.3% respectively for alcohol drinking, and 30.81%; 60.1%, and 14.6% respectively for toddy palm juice drinking. The percentages for hypertension among ever-smokers, alcohol drinkers and toddy palm juice drinkers were 27.6%; 27.0%, and 21.1% respectively. The number of alcohol bottles consumed in one year by hypertensive alcohol drinkers was higher than the number of bottles consumed by normotensive alcohol drinkers (median 91.2 vs 26; mean 143.07 ± 184.9 vs 79.8 ± 185.9). Similarly the number of bottles consumed by hypertensive toddy palm juice drinkers was also found to be higher than that consumed by normotensive toddy palm juice drinkers. (median 18 vs 12; mean 175.4 ± 400.0 vs 171.35 ± 544.6).

Measurement of blood pressure and use of anti-hypertensive drugs

Of all, 516 (68.5%) persons were found to have ever taken blood pressure measurement in life. Among them 145 (28.1%) had been told by the doctor at least once of having hypertension. And out of these 145 persons, 103 (71.03%) had been informed of having high blood pressure by the doctor at least on two occasions. Out of the 145 persons mentioned above, only 127 (87.6%) had ever been given treatment for hypertension. Two thirds (66.5%) of those who had been given treatment mentioned that they were regularly taking anti-hypertensive treatment, while 31 (24.4%) reported having taken anti-hypertensive treatment during the previous two weeks, whereas the remaining majority (75.6%) reported not having taken any treatment during the previous two weeks only seven persons reported that they were taking treatment daily.

Two thirds (68.5%) of respondents reported having been told of the total duration of treatment to be taken by the health staff. The mean duration of treatment that had been given to understand by the health staff was 8.1±17.5 days and the median duration was three days. Two thirds (65.6%) took treatment for less than three days and only 3.4% took treatment for one or more months. None of them took treatment beyond four months.

Of those with a history of hypertension, 29% reported having taken traditional medicine and 97.2% reported having been advised by health staff to reduce their salt intake. Among alcohol drinkers with hypertension, 57% were advised to reduce their salt intake. About 8% of respondents with hypertension reported having been advised by health staff for exercise. Only 9% of those with high waist-hip ratio reported having been told to reduce weight.

Serum cholesterol and HDL measurement

Of the 108 people (54 with hypertension and 54 with normal blood pressure) examined for serum cholesterol and HDL levels, eight (five in normotensive group and three in hypertensive group) had higher levels of cholesterol (≥250mg%). As shown in Table 4, the mean and median of serum cholesterol levels in the hypertensive group were slightly higher than those for the normotensive group.
Table 4. Serum cholesterol and HDL level among the hypertensive and normotensive groups, Myanmar 2001

<table>
<thead>
<tr>
<th></th>
<th>Hypertensive group</th>
<th>Normotensive group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>54</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Serum cholesterol Range</td>
<td>105 - 368</td>
<td>100 - 295</td>
<td>0.2</td>
</tr>
<tr>
<td>Median</td>
<td>178.5</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>185.1 (52.6)</td>
<td>173.05 (44.1)</td>
<td></td>
</tr>
<tr>
<td>HDL Range</td>
<td>22 - 54</td>
<td>21.6 - 56.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Median</td>
<td>39</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>38.7 (6.9)</td>
<td>38.9 (7.8)</td>
<td></td>
</tr>
</tbody>
</table>

**Dietary habit**

Out of the total study population, only 5.7% mentioned that they never ate ngapi (salted fish paste) during the past 12 months, while about half (49.2%) the population reported eating ngapi two or more times per day. However, no association was found between ngapi consumption and hypertension in this study. At the same time, 91.7% (97% in TYH and 87% in MGL) people reported having eaten dried fish during the past 12 months and 68% reported eating dried fish less than ten times a month. The daily dried fish consumption was 6% for both villages (11% in Ta-Yoke-Hla and less than 1% in MGL). One fifth (21%) of the population never drank coffee during the past 12 months, while about 20% of the population drank coffee daily with 75% of them drinking at least once a day. The correlation coefficients were found to be very small (<0.2) between systolic blood pressure and frequency of consumption of ngapi, dried fish, coffee, myanmar medicine for digestion ("yet-sar") and liquorice.

**BMI and waist-hip ratio**

The overall percentages for high BMI (≥ 25) were 3.8% for both sexes: 1.1% for males and 5.4% for females. The percentage of hypertension among the high BMI group (17.2%) was found to be non-significantly lower than the normal BMI group (22.6%).

Among males, the percentage of high waist-hip ratio (≥ 0.95) was 9.9% and the proportion of hypertension among them (12.5%) was non-significantly lower than others (18.9%). Among females, 61.4% were found to have high waist-hip ratio (≥ 0.85) and the proportion of hypertension was higher among them (30.6%) than the rest (15.0%). The mean waist-hip ratio among males and females were not significantly different for persons with or without hypertension (0.87±0.05 vs 0.86±0.05 for males; and 0.89±0.06 vs 0.87±0.07 for females).

**Odds ratios for some variables of interest**

Age, years of schooling, smoking habit of respondents and the history of stroke in mothers were found to be significant (Table 5).

**Findings of informal discussions and observations**

All participants during informal discussions mentioned that dizziness and sudden fainting attacks were the main symptoms of
hypertension, and that blood pressure should be checked for diagnosis. High fat, salty diet and mental stress (e.g. anger) were mentioned to be the main causes. Although some mentioned the possible rupture of a blood vessel in the brain as a complication, none could express its consequences on the heart, the kidney and eyes.

Table 5. Crude odds ratio and 95% confidence intervals for outcome variable hypertension among 753 respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-39</td>
<td>2.5</td>
<td>(1.20 - 5.30)</td>
<td>0.02</td>
</tr>
<tr>
<td>40-98</td>
<td>10.6</td>
<td>(5.40 - 20.90)</td>
<td>0.000</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.4</td>
<td>(1.00 - 2.10)</td>
<td>0.70</td>
</tr>
<tr>
<td>Year of schooling</td>
<td>0.8</td>
<td>(0.80 - 0.90)</td>
<td>0.000</td>
</tr>
<tr>
<td>Mother's hypertension</td>
<td>0.7</td>
<td>(0.44 - 1.15)</td>
<td>0.16</td>
</tr>
<tr>
<td>Father's hypertension</td>
<td>0.6</td>
<td>(0.26 - 1.23)</td>
<td>0.15</td>
</tr>
<tr>
<td>Mother's stroke</td>
<td>2.5</td>
<td>(1.25 - 5.04)</td>
<td>0.009</td>
</tr>
<tr>
<td>Father's stroke</td>
<td>0.8</td>
<td>(0.41 - 0.69)</td>
<td>0.60</td>
</tr>
<tr>
<td>Smoking</td>
<td>1.5</td>
<td>(1.10 - 2.20)</td>
<td>0.015</td>
</tr>
<tr>
<td>Alcohol drinking</td>
<td>1.4</td>
<td>(0.89 - 2.07)</td>
<td>0.16</td>
</tr>
<tr>
<td>Toddy palm juice drinking</td>
<td>0.9</td>
<td>(0.61 - 1.30)</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Despite the fact that some respondents mentioned eating low-salt diet; reduction of mental stress, and meditation as factors that could reduce blood pressure, it was found that they ate high amounts of ngapi made from fish in TYH or from the residue of sesame or groundnut skin in MGL.

"Ngapi is essential for us. Though it may increase blood pressure, it is cheap and hence, we, as poor people, have to eat it."

"Fish is mixed with salt, kept in the sun and pounded to make ngapi."

"Child starts to eat ngapi when he is one year old. Older people consume ngapi daily in meals, along with gourd or tomatoes."

The use of monosodium glutamate was lesser than before. Men and some women were used to drinking toddy palm juice and alcohol at ceremonies like weddings and funerals. Betel-chewing had become popular, as compared to the practice of keeping tobacco leaves in the mouth. Furthermore, the use of liquorice and tobacco leaves in combination with betel was common.

During the walk-through sightseeing, the villagers were found to be eating meals with ngapi, and making ngapi and children were found to be eating dried fish as a snack. Grocery shops sold dried fish as staple food and betel shops stocked bundles of liquorice sticks.

Discussion and conclusion

Our study found that percentages of hypertension in different age groups in the study area were high, particularly in the MGL.
village. This may be due to the racial differences in groups of these two villages. The Bamar people and Mon descendents live in TYH, while people of Pa-Oh origin are mainly living in MGL. Although they were found to be very similar in the practice of eating salty diet, there may be some factors which we have not been able to explain in this study and which may play a role in the difference in prevalence. The overall prevalence of hypertension in our study (22.4%) was found to be slightly higher than that of the previous study (21.9%) in Kanaung village in Myanmar. The percentage of these treated adequately was lower than in the previous study of the urban area of Bago in Myanmar in which half of those diagnosed were found to be taking treatment and one forth of them were adequately treated. This may be due to the fact that our study area covered the rural villages where the health staff were of a level lower than in the urban areas. The incidence of stroke was noticeable from our study, although reasons other than hypertension causing a stroke could not be excluded.

The high intake of salty diet, liquorice and tobacco leaves may be related to the high prevalence of hypertension although a significant association between hypertension and these factors was not found in this study. As is well known, this study also found a significant association between age and hypertension. The association of smoking and hypertension (OR=1.5) in univariate analysis was also found to be true as per the well-known effect of smoking on the cardiovascular system.

A previous study reported that blood pressure rises with excess sodium intake, low HDL, and increase in BMI and the waist-hip ratio. The lack of association between hypertension and other factors, such as serum cholesterol level, HDL level, dietary habits, BMI and waist-hip ratio may be due to the small sample size and to some extent, to sampling bias. The higher proportion of females than males in sample selection may be due to the fact that males travel more than females.

Our study findings indicate that health education involving hypertension should include: seriousness of taking regular anti-hypertensive treatment; the complications for different organs; cessation or reduction of smoking and alcohol drinking; effect of exercise, and reduction of salt intake. The ways and means at avoiding the traditional high-salt diet and the daily consumption of ngapi among the poor should be explained. The prevalence of hypertension among different ethnic groups should also be explored.

Acknowledgements

We would like to express our sincere thanks to Professor Dr Paing Soe, Director-General, Department of Medical Research (Lower Myanmar) for encouragement and permission to conduct this study.
References

Community Health Financing

By
Sonalini Khetrapal

Abstract
The paper looks at the issue of health care financing by the community in the broader context of health sector reforms in low-income countries. In such countries, careful analysis shows that both the public sector and the markets come up short in the provision of adequate and quality health care. Under the existing paradigm, there is an urgent need to look for an alternative mechanism in order to reach the unreached who largely reside at the periphery in rural areas where government facilities, if they exist at all, are plagued by poor infrastructure, absence of medical personnel and lack of drugs and medical supplies. The paper is an attempt to look at one such alternative in the form of community health financing.

The first part of the paper presents a review of various community-based health financing schemes that are operational in developing countries, especially chiefly in Africa and Asia. It examines the socio-political and economic situations under which they have evolved and the factors by which they are sustained. Some have worked and others have not. What then, are the crucial parameters that ensure viability and sustainability of such community health financing options? A detailed analysis of the service provided and service delivery as well as the nature of the organization has helped answer some of the crucial questions raised. Issues such as beneficiaries and entitlements, collection and management of the fund, insurance coverage and financing of premiums associated with each scheme have been studied in-depth and important implications for the design of the scheme, its capacity for resource mobilization, its sustainability and the financial protection it provides as well as the role of the government in this context, have been spelt out.

While dealing with schemes involving resource mobilization through, by and for the community, efficiency and equity considerations become important factors. In situations characterized by market’s failure to allocate scarce resources efficiently to needs, and where the public sector fails to live up to expectations, efficiency entails not only...
administrative and allocative efficiency, but also financial efficiency. To sustain a community-financed health care system, unless due consideration is given to the management of financial resources, the scheme will not be sustainable in the long run, especially in a scenario of high inflation and rapid technological progress.

The primary consideration of such community-financed schemes is not commercial, i.e., it is not driven by the profit motive but by the welfare motive. In this context, it is vital that economic instruments are innovatively woven into the schemes to encourage more equitable financing of health care. The concept of risk-sharing leading to an innovative premium-setting can be used in such a way as to entail a subsidy from the healthy to the sick. Since affordability is the key issue in terms of equity, the gamut of allowances and exemptions in the context of payment of premiums and user fees has been analysed.

Having reviewed community health financing schemes, several unmistakable conclusions have emerged. They relate to the conditions under which operation of such schemes become successful despite the inherent strengths and weaknesses of the system. Some schemes have been found to have fundamental design and managerial flaws. Evidence suggests that cost-recovery levels under rural insurance are likely to be limited in most developing countries. Therefore, governments have a definitive role to play in terms of using general revenue financing to offset the gaps in financing such health care. Sustained donor and/or government support is necessary to make community health financing successful in the long run.

The Problem for Developing Countries

The most urgent and vexing problem around the world today in the provision of health care is how to provide adequate health services to the poor in rural areas and in urban slums. The Universal Declaration of Human Rights and the 1978 Declaration of Alma-Ata globalized health care and set an onerous responsibility on governments and the international community. Clearly, health is not socially neutral. It carries profound implications for social justice. It has implications for more than two billion poor in the rural areas and the informal sector of low-income countries. As pointed out by Bill Hsiao this population is not a homogeneous group. “Their occupations range from farmers, peddlers, day labourers, taxi drivers, and employees of the informal sector to shop owners and self-employed professionals. Yet this heterogeneous group shares the same lack of access to health care that is often due to inadequate health care financing”.

Pressures for health sector reform striving for equity have been steadily mounting worldwide to the extent that almost every country is conscious of exploring ways to provide equity and efficiency in the delivery of health care.

In this context low-income countries are plagued with three major health policy issues:

(1) Mobilization of sufficient resources to finance health care;

(2) Utilization of funds in a manner to provide efficient service, and

(3) Mechanisms to provide cost-effective health care.

In many low-income countries around the world, governments claim to provide free universal health care. However, this often results in the provision of inadequate and poor quality service. Markets, which most people are compelled to turn to as an alternative, tend to be motivated largely by profit making. To understand the various dimensions of this problem, it is necessary to examine the various causes of unmet health needs of the poor. This raises three basic questions.

First, is a nation spending a reasonable amount for its health? Many countries do not spend enough for health care, especially on their rural residents and urban poor. But the more important question is whether governments are in a position to spend more. Most low-income nations have too narrow a tax base and ineffective tax collections to yield large sums of general revenue. In deciding the share of the limited general revenue to be spent on health, the political economies of most nations result in inadequate public funding for basic health care for the rural and poor households. Some suggest user fees as an alternative. The evidence is mixed. Litvack and Bodart* have shown that where user fees cover primary care and essential drugs with affordable prices, they may be much lower than what people payed before. While assessing how user fees and improved quality affect health facility utilization among the overall population, especially among the poorest people in Cameroon, it is indicated that the probability of using the health centre increased significantly for people in those areas which introduced user fees compared to those in the control areas. Travel and time costs involved in seeking alternative sources of care are high. When good quality drugs became available in the local health centre, the fee charged for care and treatment represented an effective reduction in the price of care and thus utilization rose. It was also found that the probability of the poorest quantile seeking care increases at a rate proportionately greater than the rest of the population. However user fees, other studies show, create a higher barrier of access to health care for the poor.

Second, does a nation have the capacity to transform available resources into effective services for the rural and poor population? In many countries where the government funds and provides free or nearly free services for the poor, the target population is found not utilizing those public health services. Empirical evidence shows that these households use their meagre income to pay for the services and drugs from the private sector. Detailed country studies have consistently found a disturbing fact concerning the inefficiency of governments in funding the public provision of health care. Governments have not been able to manage and monitor these publicly-funded services efficiently and effectively.

Whatever funds are spent do not produce satisfactory services for the people or add value, yet health infrastructure continues to be built. Thus, public funds are used largely to support the salaries of health workers without effective utilization which leads to unproductive results. This practice seems to be more a means to support a public employment programme rather than a health delivery strategy to meet patients' needs and demands. As a result, when people become ill, they choose to pay from their limited resources to visit private practitioners and buy (usually over-prescribed) drugs.

Third, we know that the amounts spent directly by households have not purchased the most cost-effective services. Can these resources be organized so they will be used more effectively? Out-of-pocket payments to private providers have some serious drawbacks. First, there is no risk-pooling. Second, patients have to pay whatever private practitioners and drug peddlers charge. At the village level, the prices can be high since sometimes the population size is not likely to be able to support additional providers competing with each other. At the sub-district (township) level, the competition is also limited because of the population size. Also, the health service market suffers from well-documented market failures that can result in price gouging, poor medical quality, and induced demand for drugs sold at a high profit. If households are willing to prepay the amount that they now pay out of pocket into an organized financing scheme, collective gains can be obtained. The organized fund could pool risks, improve quality and expand the delivery of health care, using the same amount of money.

Combinations of the above three problems exist in varying degrees in different low-income countries and accentuate the need to identify some alternative mechanism to address the problem. The concept of community financing has emerged in this context.

What is Community Financing?

The term “community” as used by both sociologists and geographers, refers to any set of social relationships operating within certain boundaries, locations and territories. The term has both descriptive and prescriptive connotation in both popular and academic usage. Worsley (1987) has suggested that despite the difficulties involved in theorizing about “community”, three broad meanings can be identified within sociological literature. For the first he describes "community as locality". Here the interpretation of the term comes closest to its geographical meaning of 'a human settlement within a fixed and bounded local territory'. Secondly he suggests that 'community' has been used to denote 'a network of interrelationships' (Stacey, 1969). In this usage, community relationships can be characterized by conflict as well as by mutuality and reciprocity. In the third usage, community can be seen to refer to a particular type of social relationship, one that possesses certain qualities. It infers the existence of a 'community spirit' or

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'community feeling’. This usage comes closest to the commonsense usage and does not necessarily imply the existence of a local geographical area or neighbourhood.

Thus community financing can be defined as any scheme that is broadly characterized by the following three features:

1. It is voluntary in nature (although examples of mandatory insurance can be found in Boboye, Niger);
2. Payment for health care is made by the community members, and
3. Community control of resources and their management.

In such a situation the community gets together and finds ways of financing its unmet health needs. Such community-based financing covers different mechanisms of mobilizing resources such as micro-insurance, community health fund, mutual health organizations, revolving drugs funds, and community involvement in user fee management.

Community financing arrangements can significantly differ from each other in terms of their objectives, structure, management, organization, and institutional characteristics. For example, community-level revolving drug funds in the Honduras would qualify as community financing, so would the hospital-based prepayment/risk-sharing scheme of Bwamanda, or individual savings account for pregnant women in Indonesia. Yet, these various arrangements have different capacities to mobilize resources, to provide financial protection and include the poor. Regardless of the terminology used, the definitions converge on several points. In particular, the role of the community, the nature of the beneficiary group, and the social values underlying the design of the schemes stand out as key descriptors.

Review of community financing schemes

Evolution of community financing: role of economic factors

Community financing of health has evolved from different contexts essentially in response to prevailing circumstances which in turn depend upon the existing stage of development. For example, the Democratic Republic of Congo’s Bwamanda scheme and Guinea-Bissau’s Abota scheme were developed in response to the near collapse of government-funded health care. China’s Cooperative Medical System was developed when communal agricultural production was emphasized as the main mechanism for economic development. When macro-economic policy shifted to the “socialist market” and central and provincial government subsidies were cut and redirected, the system collapsed.” However, there is an indication that there has been a kind of revival of cooperative medical schemes since the early nineties.


The overall economic situation and the direction of policy very often shape the local context. Other factors that may encourage risk-sharing mechanisms include decentralization policy, traditions of community initiative and management, nongovernmental organization (NGO) activity or other forms of technical assistance and monetization in the local economy (such as cash or subsistence crops). The existing health care system may also lead to community financing mechanisms. For example, the quality and availability of health services, particularly government services, might define the need for additional or better service providers. Insurance may be seen as a mechanism for improving or extending the provision of health services. In addition, the cost of existing services may enable or inhibit the development of risk-sharing. Hence, the availability, price, and quality of private provision may help determine which services are covered in the benefits package. In Thailand, the scale of private provision made it clear that rural insurance, like urban insurance, would have to cover services provided by private practitioners, as well as by government clinics and hospitals. Thus the configuration, quality, and price of existing health services help shape community health schemes.

In most cases, people are accustomed to paying fees prior to the introduction of risk-sharing schemes. Very often fees are so high that a large portion of the population cannot afford them. This is particularly the case for facility-based schemes; where facilities often face declining use because of high fees and low revenues. Such arrangements lead to considerations of insurance. In the Democratic Republic of Congo, for example, health zones were meant to be self-supporting; thus, other than funds received from external donors, zones had to recover full operating costs. In other African countries (notably Ghana and Kenya), schemes were initiated by mission hospitals that have been forced to rely on fee income, as government subsidies and external support have dried up.

The existence of other types of insurance schemes in a country does not appear to affect the uptake of rural risk-sharing, but many people understand the notion of risk-sharing, because they are used to traditional mutual self-help mechanisms. (Wong share in Thailand, Gotong Royong in Indonesia, Abota in Guinea-Bissau). Schemes are located both in areas where most beneficiaries are subsistence farmers (as in Nepal and Guinea-Bissau) and in areas where a large number of farmers are organized in cooperatives. Cooperative and mutual schemes usually develop where labour is more organized.

In some instances, schemes are also initiated in the face of a breakdown in government finance for health care (for example, in the Democratic Republic of Congo, Guinea-Bissau, and recently in China). Although some schemes (such as that in Guinea-Bissau) operate in small, close-knit communities, others cover large districts among diffused communities. In Guinea-Bissau, the cohesiveness and small size of local villages are factors supporting the

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success of the schemes\textsuperscript{1}. However, the importance of this factor depends on the ownership of the scheme. Trust within the community is crucial especially where funds are community-owned.

Economic growth often supports the growth of risk-sharing. In East and South-East Asia, rapid expansion of health insurance in the non-formal sector coincided with rapid economic growth. Even in Bwamanda, the Democratic Republic of Congo, one of the factors contributing to the success of the scheme was a buoyant local economy, attributable to a donor-funded rural development project that established the health insurance scheme\textsuperscript{2}.

\textbf{Community participation}

\textbf{Beneficiaries - the problem of adverse selection}

In most community schemes, potential beneficiaries are defined both by geographic location (particularly catchment areas for hospital-based schemes and village, ward, or district of residence) and by employment variables (be it occupation, place of work or the manner in which the product is sold). In some cases, the beneficiaries are defined on the basis of income category. For example, India’s Kasturba Hospital scheme which is targeted at the poor.

Most schemes are based on the household as the unit of membership. The schemes that initially allowed individual enrolment often faced problems of adverse selection and switched to household enrolment. In Nkoranza, Ghana, premiums were set individually, but the entire household had to join. The failure of insurance scheme workers to sign up all members of a household, however, contributed to the failure of the scheme. Other measures that prevent adverse selection include the requirement that a minimum number or portion of households in a village or administrative area have to join a scheme. In the Kasturba programme, at least 75% of poor households in a village must join. Similarly, in Thailand, at least 30% of households in a village had to join in order for the village to participate in the earlier health card scheme.

\textbf{Timing and coverage}

If enrolment in a scheme is allowed over a long period and there is no waiting period, then people tend to enrol when they need care. At the VETS Hospital in Chennai, India, where enrolment was allowed throughout the year without a waiting period, less than a quarter of subscribers renewed their membership. The remaining three quarters probably joined when they got sick, eroding the insurance effect of the scheme\textsuperscript{3}. Several schemes that planned to have a limited enrolment period later extended it because enrolment rates were low. Users who enrol only when they get sick create big problems.

\textsuperscript{1} Chabot, J., and F. Savage. 1984. A Community Health Project in Africa, St. Albans, U.K.: Teaching Aids at Low Cost (TALC)

\textsuperscript{2} Moens, F. 1990 “Design, Implementation and Evaluation of a Community Financing Scheme for Hospital Care in Developing Countries: A Pre Paid Health Plan in Bwamanda Health zone, Zaire.” Social Science and Medicine 130(12): 1319-27

in hospital-based schemes, where the need for service is most unpredictable and bears large financial consequences.

For community schemes covering mainly primary care it is easier for households to predict utilization and decide whether it is worth joining. The Bwamanda hospital scheme stands out as having strikingly high coverage relative to other schemes. Many community-owned schemes failed to cover more than 10% of the target population.

The East and South-East Asia economies provide coverage for the poor by issuing special low-income cards or developing schemes specifically for the poor, rather than integrating them into the health insurance system.

**Financing of premiums**

Three important considerations regarding financing of premiums emerge. They relate to:

1. Mode of payment;
2. Periodicity of payment, and
3. Investment of the available corpus.

**Mode of payment**

In most of the schemes, premiums are generally flat-rate premiums, paid on an annual basis. In-kind payments are generally not accepted. Few schemes take proceeds from cooperative sales. However, there are exceptions to this general pattern. Two hospital-based schemes in India (Kasturba and VHS) and one scheme in Bangladesh set premiums on a sliding scale according to income. Some villages in Guinea-Bissau, the scheme in Lalitpur, Nepal, and the Kasturba hospital scheme in India allow payment in kind. Interestingly, very few poor agricultural communities in Nepal choose to pay in kind”.

**Periodicity of payment**

The Dana Sehat scheme in Indonesia and the ORT scheme in the Philippines are the only insurance schemes of the ones studied that allowed payment of premiums more than once a year. Still, monthly payments create difficulties for workers with seasonal income. The ORT scheme adopted a flexible payment schedule because it was felt that many households would not be able to afford the annual premium in one lumpsum. A number of families, however, dropped out of the scheme because they failed to keep up payments*

**Investment option**

Where premiums are collected at one point in time and must meet financial commitments for an entire year, it is essential (particularly in high-inflation environments) that the funds are invested. In its first year of operation, Ghana’s Nkoranza scheme ran into difficulty because it had no investment policy and high inflation rates rapidly eroded the value of the fund. In later years, however, the scheme bought treasury bonds. Several innovative ways to combat inflation have been found. In the Democratic Republic of Congo’s Masisi scheme, funds were held by the district

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pharmacy which immediately converted revenues into drugs. In the Bwamanda scheme, funds were capitalized by the NGO. Reviews in Myanmar and Thailand also suggest that investments often take the form of interest-bearing loans to community members*. Protecting the scheme against fraudulent claims often proved difficult because in many cases it was difficult to check the identity of the person seeking care.

**Exemptions**

Few schemes had built-in exemption policies. In Boboye, Niger, the indigent could get special waivers**. In Guinea-Bissau’s Abota scheme villagers could choose to give access to drugs despite the fact that they had not paid*. In the ORT scheme project staff tried to seek supplementary funds to subsidize the premiums of 20,000 poor families. In Lalitpur, Nepal, poor households could get a free health card if they had a letter from a community leader***. Elsewhere, people who could not afford premiums would simply pay user fees when using the service.

On the whole, benefits packages are generally not well defined. Some schemes have exclusions (for example, sexually transmitted diseases in Vietnam, dental services in the Philippines’ ORT scheme), but otherwise schemes tend to cover all the services available at participating facilities. The main problem with this approach was high enrolment rates among people with pre-existing conditions, particularly chronic illnesses. Kenya’s Chogoria hospital scheme initially had a very broad benefit package covering all such conditions. But when the scheme was recently reviewed, the benefits package was modified as presented in the box below.

<table>
<thead>
<tr>
<th>Box 1. Exclusions and limits under Kenya’s Chogoria Hospital Health Insurance Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Diseases that were diagnosed prior to joining the scheme or within the waiting period are not covered.</td>
</tr>
<tr>
<td>- Coverage is discontinued when a person turns 65.</td>
</tr>
<tr>
<td>- Treatment of patients with AIDS is provided up to a maximum of Sh 36.00 a year.</td>
</tr>
<tr>
<td>- Treatment of psychiatric illness is limited to Sh 68.00 per policy per year.</td>
</tr>
<tr>
<td>- Expenses that are associated with normal or abnormal pregnancy are not covered (although the operation fee (or a first caesarean section is covered).</td>
</tr>
<tr>
<td>- Reading glasses, eye and ear tests, and healing aids are not covered.</td>
</tr>
<tr>
<td>- Self-inflicted injuries are not covered.</td>
</tr>
<tr>
<td>- Birth defects and cosmetic surgery are not covered.</td>
</tr>
<tr>
<td>- Dental procedures are not covered.</td>
</tr>
<tr>
<td>- Medical examinations are not covered.</td>
</tr>
<tr>
<td>- Procedures carried out for non-medical reasons are not covered (circumcision, for example).</td>
</tr>
</tbody>
</table>

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*** Chabot J, M Boal, and A Da Silva 1991 National Community Health Insurance at the Village Level: The Case from Guinea-Bissau.” Health Policy and Planning 6(1): 46-54
Cost recovery

For many years, community health insurance was the sole source of finance for drugs in many communities in Africa. It should be emphasized, however, that the drugs stocked at the community level were very basic (just twelve essential drugs), and that drugs were sold to health posts at donor-subsidized prices. About 90% of the cost of essential drugs was covered by donors. All the schemes relied on funds other than those obtained from premiums. Congo’s Bwamanda scheme stands out, with a cost recovery ratio of about 80%. Guinea-Bissau’s Abota scheme is another scheme perceived to be successful.

The VHS scheme in Chennai, India, charged premiums on a sliding scale, which led to very different rates of cost recovery. Predictably, most of the people (74%) that joined the scheme were uninsured. Health centres record all insured persons on separate registers and at the end of each month present claims to the fundholders, who pay them. This procedure covers no more than about 3% of recurrent costs; the same level of revenue would otherwise be collected through user fees. On the other hand, the ORT scheme in the Philippines aims to recover costs fully, but it does not set premiums on an actuarial basis. Presumably in this case input levels or co-payments are adjusted to reflect the revenue received.


Administration and management

Under some of the schemes reviewed, the management structures were very simple. In Guinea-Bissau, one of the main reasons for implementing a prepayment (as opposed to a user fee) system was its administrative simplicity. A village leader would simply visit each household once a year and ask for payment of a fixed amount. After an initial learning period, villagers managed the scheme well, although increasing economic pressures eventually led to misuse of funds that threatened the credibility of the scheme. In Nepal’s United Mission scheme, village committees made some very good decisions, particularly relating to exemptions, but were inept at accounting for funds and communicating their plans to the rest of the village.

Usually, all the hospital-based schemes paid the hospital on a case or fee-for-service basis. For most of the primary care schemes, all funds collected were allocated to the nearest provider on a lumpsum basis. The Thai scheme was an interesting exception, which provided access to all levels of care if patients were referred. Initially, therefore, there was a fixed formula for allocating funds between different levels of the system. For example, in Chiang Mai, 15% of funds were ultimately retained by the village committee, 20% by the health centre, 33% by the community hospital, and 32% by the provincial hospital. These allocations varied somewhat between provinces. Since there

were strict referral procedures in order to be eligible for fund coverage, these fixed proportions could be estimated to some degree. However, under this payment system higher service levels, particularly district hospitals, often felt that they received an unfair share of funds.

### Role of NGOs

Most community-financed programmes are run by NGOs or non-profit organizations. Boxes 2 and 3 elaborate on select schemes in India.

<table>
<thead>
<tr>
<th>Box 2. Salient Characteristics of Selected NGO-managed Health Insurance Schemes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voluntary organizations/ location</strong></td>
</tr>
<tr>
<td>Sevagram/ Wardha, Maharashtra</td>
</tr>
<tr>
<td>Bombay Mother and Child Welfare Society (BMCWS)/ Chawla in Bombay</td>
</tr>
<tr>
<td>Raigarh Ambikapur Health Association (RAHA)/ Raigarh, Madhya Pradesh</td>
</tr>
<tr>
<td>Christian Hospital/Bissamau Cuttack, O rissa</td>
</tr>
<tr>
<td>Voluntary organizations/location</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>UPASI Coonoor, Tamil Nadu</td>
</tr>
<tr>
<td>Gopalpur Co-operative Health Society, Shantiniketan, West Bengal</td>
</tr>
<tr>
<td>Students' Health Home, West Bengal</td>
</tr>
<tr>
<td>Saheed Shabsankar Saba Samithi (SSSS) Burdwan, West Bengal</td>
</tr>
<tr>
<td>Arvind Eye Hospital Madurai, Tamil Nadu</td>
</tr>
<tr>
<td>Tribovandas Foundation, Anand, Gujarat</td>
</tr>
<tr>
<td>Voluntary organizations/ location</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>SEWA Ahmedabad, Gujarat</td>
</tr>
<tr>
<td>CINI Daulatpur, West Bengal</td>
</tr>
</tbody>
</table>


### Box 3. Prepayment and Insurance Mechanisms in Selected NGO-Managed Health Insurance Schemes

<table>
<thead>
<tr>
<th>Features</th>
<th>Sevagram</th>
<th>RAHA</th>
<th>Tribovandas Foundation</th>
<th>Goalpara</th>
<th>Students health Home</th>
<th>SSSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover-age provided</td>
<td>Household</td>
<td>Individual</td>
<td>Household</td>
<td>Household</td>
<td>Institutional and individual</td>
<td>Individual</td>
</tr>
<tr>
<td>Annual subscription fee</td>
<td>8 payali</td>
<td>Rs 5 or Rs 2 sorghum</td>
<td>Rs 10</td>
<td>Rs 18 in cash or in kind (rice or labour)</td>
<td>Rs 2 Institutions Rs 6- Individuals</td>
<td>Rs 2 or Rs 5</td>
</tr>
<tr>
<td>Features</td>
<td>Sevagram</td>
<td>RAHA</td>
<td>Tribovandas Foundation</td>
<td>Goalpara</td>
<td>Students health Home</td>
<td>SSSS</td>
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<td>------</td>
</tr>
<tr>
<td>Number of members</td>
<td>At least 75% of households (23 villages covered)</td>
<td>Total insured 14 390</td>
<td>Approximately 1/5 to 1/6 of all households in villages, (319 villages covered)</td>
<td>150 out of 175 households in village</td>
<td>630 institutes: total 350 000 students covered</td>
<td>6 800</td>
</tr>
<tr>
<td>Member entitlement</td>
<td>Community care: free CHW services, drugs and mobile (doctor + ANM) services</td>
<td>Hospital: free care for unphased illness episodes, 25% subsidy for anticipated illness episodes, e.g. pregnancy and chronic ailments</td>
<td>Community care: free CHW services and drugs. Free health centre services including MCH clinic</td>
<td>Hospital: 50% subsidy</td>
<td>Dispensary: Free doctor consultations, drugs at cost, Free periodic public health activities</td>
<td>Polyclinic/regional clinics: free consultations, drugs, diagnostic tests, operations, bed stay at nominal charges</td>
</tr>
<tr>
<td>Non-member entitlement</td>
<td>Non-members not entitled to use community health services</td>
<td>Non-members charged for drugs (over cost), not entitled to attend MCH clinic</td>
<td>Non-members have same emoluments to community services as members but not to hospital care</td>
<td>Non-members charged for drugs (over cost)</td>
<td>Non-members not entitled to avail of services</td>
<td>Non-members are not entitled to avail the services</td>
</tr>
<tr>
<td>Management of fund</td>
<td>VHW responsible for membership collections, Collections once a year at harvest time.</td>
<td>Individual health centres responsible for membership collections. Collections once a year.</td>
<td>VHW services responsible for membership collections. Collected once a year at times-</td>
<td>Village health communities - funds collections once a year.</td>
<td>Institutions enrolled once a year. Individuals ongoing (no waiting period)</td>
<td>Able to enrol through the year. No waiting period between enrolment and service entitlements.</td>
</tr>
</tbody>
</table>
Under the much-quoted SEWA scheme, the health insurance programme is linked to the primary health care programme. The programme is not only preventive but also promotive. It was started in 1992 in Ahmedabad with an enrolment of 7,000 women and was later extended to more than 30,000 women, mostly rural. SEWA has integrated the national health insurance schemes into a comprehensive health insurance package to address women's basic needs. Most women opt for a fixed deposit with the SEWA Bank of Rs 500 to 700, the interest on which goes towards payment of the premium. However, membership in SEWA is voluntary which enables adverse selection.

<table>
<thead>
<tr>
<th>Box 4. Coverage under SEWA Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provider</strong></td>
</tr>
<tr>
<td>New India Assurance</td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>SEWA</td>
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<tr>
<td></td>
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<tr>
<td>Life Insurance Corporation of India</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Note: Total premium for the entire package is Rs. 60 plus a service charge of Rs. 5

* Chatterjee, Mirai and Vyas, Jayshree (1997) Organizing Insurance for Women Workers: The Sewa Experience, Self Employed Women’s Association (SEWA), Ahmedabad
Assessing schemes on the basis of efficiency and equity criteria

Efficiency

Administrative efficiency: In some cases (such as Guinea-Bissau’s Abota), the prepayment route is taken because it is seen as being administratively more efficient than user fees. In other instances such as Ghana’s Nkoranza, even though the administrative costs (particularly the use of time of scarce skilled personnel) appear to be high, yet substantial problems remain in the administration of the scheme.

Allocative and technical efficiency: Fee-for-service reimbursement has a number of documented shortcomings; it provides little incentive for efficiency on behalf of the hospital. It does not guard against problems of cost escalation. It is also administratively complex. Fee-for-service payment gives providers incentives to over-service and over-prescribe. In most cases, over-provision is not regarded as a serious issue because the provider is a government or mission facility and staff is paid on a salary basis. However, it is a concern in Masisi, Democratic Republic of Congo, where part of hospital revenue is used as incentive payments for doctors*. Most of the schemes are characterized by fairly weak purchasing agents. Only a few develop cost-effective packages of care, and implement strong referral and utilization control systems to optimize efficient use of different levels of the health care system. Only a handful implement a management information system to monitor cost-effectiveness or appropriateness of care delivered. At times, these schemes introduce inefficiencies into the system. For example, many hospital-based schemes largely ignore primary care. This results in under-utilization of health centres (leading to facilities operating at low capacity and rising unit costs) while patients are treated less efficiently at the hospital level. The hospital-based schemes in Nkoranza, Ghana and Masisi and Bwamanda, Democratic Republic of Congo, experienced rapid cost escalation, at least in their early years. If funds are held at the community level, then it is in the interest of the fundholder to ensure that unnecessary utilization of expensive secondary-level services does not occur.

Financial efficiency: Over time, most of the schemes are able to devise ways to invest the revenue raised from the insurance scheme. However, scheme managers do not always think out this aspect adequately prior to implementation, and heavy financial losses in the first year could adversely affect the financial efficiency of any scheme for a long period.

Equity

In countries where there is substantial coverage by rural risk-sharing schemes (for example, in China prior to the breakdown of the Cooperative Medical System) equity between schemes is a major issue. In China, the type of care to which people had access varied substantially according to the wealth of the community. Poor communities could often only afford to cover primary care services and did not cover in-patient services at county hospitals. A few countries provide evidence on equity issues between formal

and informal schemes. In many countries however, formal schemes are nonexistent or very limited.

In financing, risk-sharing has been promoted as a means of encouraging more equitable financing of health care. The use of flat-rate premiums implies regressivity in financing. All the insurance schemes examined set premiums on a community-rated basis and thus entailed a subsidy from the healthy to the sick. Few schemes, however, adopted sliding scales. A sliding scale system in Bwamanda allowed lower co-payments for more distant residents but was abandoned because of the extra administrative cost and because it did not appear to affect utilization. It did, however, improve enrolment and thus would have effectively reduced adverse selection.

Affordability is probably the key issue in terms of equity. Few schemes made special allowances for people who could not afford to pay the premiums. In most cases, people who could not afford premiums were required to pay user fees instead. Thus the effectiveness of insurance in protecting the poor is at times diluted by the quantum of exemptions that are built-in. Several schemes that examined the issue of affordability acknowledged that it could be a problem, although the evidence was not always clear cut. For moderate to large low-income households in Nkoranza, Ghana, the estimated cost of premiums ranged from 5—10% of the annual household budget, which may well constitute a financial barrier to membership. In Muyinga, Burundi, 27% of respondents to a household survey stated that financial inability to purchase a card was one of the main reasons they did not participate in the scheme. In Mexico, about 20% of enrollees in a perinatal prepayment scheme dropped out, and this was mainly attributed to financial inability to keep up payments.

Other Issues

Utilization

Once a scheme is in place, it is very important to study the patterns of utilization and other qualitative indicators related to the scheme. Only the pilot project in Boboye, Niger analysed how utilization patterns varied by income groups. In Boboye, it was found that utilization rates among the poor had gone up since implementation of the scheme.

Consumer satisfaction

It appears that during the design phase most of the schemes paid little attention to consumer satisfaction, or even to what consumers wanted. None of the studies reported surveys of consumer satisfaction, and few had carried out marketing surveys prior to implementation. As judged by the demand for the schemes, consumer satisfaction was often low. Where people try to enrol when they need care, the need for service is most unpredictable and bears higher financial consequences. For

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community schemes covering mainly primary care, it is easier for households to predict utilization and decide whether it is worthwhile to join.

**Voluntary nature of schemes**

Many of the problems associated with the schemes stem from their voluntary nature. It has been argued that in the developing country context, mandatory schemes for informal sector workers are unlikely to be feasible because there is insufficient knowledge about the number and location of rural households. Identification, income assessment, and contribution collection can rapidly become an expensive process in rural areas. However, authorities in Boboye, Niger, managed to implement a mandatory insurance scheme through an earmarked tax. More investigation of the prospects for implementing mandatory schemes in low-income countries is needed. Clearly, mandatory forms of risk-sharing will be easier to implement in areas where local government taxation systems are extensive and well developed.

The evidence from these experiences suggests that there are several constraints to community financing options:

1. The small scale of the revenue raised;
2. Adverse selection, leading to progressively smaller risk pools and higher costs, and
3. Heavy administrative structures and costs.

These constraints often led to low levels of cost recovery. Furthermore, schemes often received substantial input, particularly technical input, from donors and expatriates, which suggests that they might otherwise be unsustainable. These explain why some of these schemes have been relatively short-lived.

**Factors affecting the success of community health financing schemes**

Some key factors have stood out in favour of successful resource mobilization and effective financial protection by communities. These are:

- Active involvement of the community (geographic, religious, professional, and ethnic) engaged in mobilizing, pooling, and allocating resources for health care and scheme management;
- Ability to address adverse selection and rent-seeking provider behaviour through revenue collection, and purchasing instruments;
- Durable relationship between the scheme and providers to achieve better value for the money for their members;
- Sustained donor and/or government support;
- The beneficiaries of the scheme have predominantly low income, earning subsistence from the informal sector (rural and urban); or socially excluded;
- The schemes are based on voluntary engagement of the community (although not necessarily of the individual community members), and
The structure of resource mobilization and benefits reflects principles of solidarity and cohesiveness and the motivating force is not commercial (profit) but welfare-oriented.

Based on an extensive survey of literature, the main strengths of community financing schemes have been found to be the degree of outreach penetration achieved through community participation, their contribution to financial protection against the cost of illness, and increase in access to health care by low-income rural and informal sector workers. The results do however suggest that risk-sharing corrects for, and outweighs the negative effect of overall income inequality, suggesting that financial protection against the cost of illness may be a more effective poverty-alleviation strategy in some settings than direct income support.

Alexander S. Preker, Guy Carrin, David Dror, Mellitta Jakab, William C. Hsiao and Dyna Arhin-Tenkorang have admirably summed up the strengths and weaknesses of community financing schemes in boxes 5 and 6.

<table>
<thead>
<tr>
<th>Box 5. Strengths of Community Financing Schemes</th>
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<tbody>
<tr>
<td><strong>Technical Design Characteristics</strong></td>
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<tr>
<td>Revenue Collection Mechanisms</td>
</tr>
<tr>
<td>- Shift away from point-of-service payment to increasing prepayment and risk-sharing.</td>
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<tr>
<td>- Flat-rate premium, which facilitates revenue collection, reduces the scope for manipulation, and contributes to low transaction costs.</td>
</tr>
<tr>
<td>- Contribution payment that accommodates the income-generating patterns of households employed in agriculture and the informal sector (irregular, often non-cash).</td>
</tr>
<tr>
<td>- Modest degree of household-level affiliation.</td>
</tr>
<tr>
<td>- Pro-poor orientation even at low-income levels through exemptions of premiums and subsidies, despite flat-rate contribution rate.</td>
</tr>
<tr>
<td>- Some buffering against external shocks though accumulation of reserves and links to formal financing schemes.</td>
</tr>
<tr>
<td><strong>Arrangements for Pooling Revenues and Sharing Risks</strong></td>
</tr>
<tr>
<td>- Some transfers from rich to poor, healthy to sick, and gainfully employed to inactive through some pooling of revenues and sharing of risk within community groups.</td>
</tr>
<tr>
<td><strong>Purchasing and Resource Allocation</strong></td>
</tr>
<tr>
<td>- Most community schemes make a collective decision about who is covered through a scheme, based on affiliation and direct family kinship (for whom to buy).</td>
</tr>
<tr>
<td>- Many community schemes define the benefit package to be covered in advance (what to buy, in what form, and what to exclude).</td>
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<tr>
<td>- Some community schemes engage in collective negotiations about price and payment mechanisms.</td>
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</tbody>
</table>
Management

- Most community schemes are established and managed by community leaders. Community involvement in management allows social controls over the behaviour of members and providers that mitigates moral hazard, adverse selection, and induced demand.
- Many schemes seek external assistance in strengthening management capacity.
- The management culture tends to be consensual (high degree of democratic participation).
- Most schemes have good access to local utilization and behaviour patterns.

Organizational Structure

- Most community schemes are distributed organizational configurations that reach deep into the rural and informal sectors.
- Incentive regimes include: (a) extensive decision rights, (b) strong internal accountability arrangements to membership or parent community organization, (c) ability to accumulate limited reserves if successful but unsuccessful schemes often ask governments for bailouts, (d) mainly factor-market exposure since few overlapping schemes compete with each other in the product market, and (e) some limited coverage of indigent populations through community or government subsidies.
- Vertical integration may lead to increased efficiency and quality services. Schemes that have a durable partnership arrangement or contractual arrangement with providers able to negotiate preferential rates for their members. This in turn increases the attractiveness of the scheme to the population and contributes to sustainable membership levels.
- Better organized schemes use horizontal referral networks and vertical links to formal sector.

Institutional Environment

- Stewardship function is almost always controlled by local community, not central government or national health insurance system, which is apt to make the schemes responsive to local contexts.
- Ownership and governance arrangements (management boards or committees) are almost always directly linked to parent community schemes; freestanding health insurance schemes are rare.
- There is little competition in the product market.
- Competition is limited in factor markets and through consumer choice.

Source: Alexander S. Preker, Guy Carrin, David Dror, Melitta Jakab, William C. Hsiao, and Dyna Arhin-Tenkorang; Health Financing for Poor People, 2003

Nevertheless, an interesting question that requires further exploration is as to what extent better inclusion of the vulnerable would be due to subsidies for the poor (through social organizations, government, or donors) or due to participatory social structures. In other words, to what extent can income deprivation be overcome? Participatory structures have their weaknesses. The rich always have the financial incentive to opt out of income-pooling arrangements. Achieving a high level of participation may be costly, and especially so for the poor.
**Box 6. Weaknesses of community financing schemes**

<table>
<thead>
<tr>
<th>Technical Design Characteristics</th>
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<tbody>
<tr>
<td>• Revenue Collection Mechanisms</td>
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<tr>
<td>• Without subsidies, resource mobilization is limited when everyone in the pool is poor.</td>
</tr>
<tr>
<td>• Many of the poorest do not join since they cannot afford premiums.</td>
</tr>
<tr>
<td>• Pro-poor orientation is undermined by regressive flat-rate contributions and by a lack of subsidies or premium exemption, which create a financial barrier for the poor.</td>
</tr>
<tr>
<td>• Community-based voluntary prepayment schemes are also prone to adverse selection.</td>
</tr>
<tr>
<td>• Few schemes have reinsurance or other mechanisms to buffer against large external shocks.</td>
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<tr>
<th>Revenue-Pooling and Risk-Sharing Arrangements</th>
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<tr>
<td>• The scope for transfers within very small pools is limited (often fewer than 1 000 members per scheme).</td>
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<tr>
<th>Purchasing and Resource Allocation</th>
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<tbody>
<tr>
<td>• Without subsidies, the poorest are often left out (for whom to buy).</td>
</tr>
<tr>
<td>• The benefit package is often very restricted (what to buy, in what form, and what to exclude).</td>
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<tr>
<td>• Providers can often exert monopoly power during price and payment negotiations.</td>
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<tr>
<th>Management</th>
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<tbody>
<tr>
<td>• Community leaders are as vulnerable to adverse incentives and corruption as national bureaucrats.</td>
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<tr>
<td>• Even with external assistance, absorptive capacity in management training is limited.</td>
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<tr>
<td>• Extensive community consultation is time-consuming and can lead to conflicting advice.</td>
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<tr>
<td>• Most schemes do not use modern information management systems.</td>
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<tr>
<th>Organizational Structure</th>
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<tr>
<td>• Even widely distributed organizational configurations may have difficulty reaching deep into the rural and informal sectors.</td>
</tr>
<tr>
<td>• There are often conflicting incentives, especially among extensive decision rights, soft budget constraints at time of deficits (bailouts by governments and external sources of funding such as nongovernmental organizations), limited competitive pressures in the product markets, and lack of financing to cover the poorest population groups.</td>
</tr>
<tr>
<td>• The less-organized schemes are often cut off from formal sector networks.</td>
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<thead>
<tr>
<th>Institutional Environment</th>
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</thead>
<tbody>
<tr>
<td>• Government stewardship and oversight function are often very weak, leading to a poor regulatory environment and lack of remedies in the case of fraud and abuse.</td>
</tr>
<tr>
<td>• Ownership and governance arrangements are often driven by non-health and financial protection objectives.</td>
</tr>
<tr>
<td>• Choice in strategic purchasing is limited by small number of providers in rural areas.</td>
</tr>
<tr>
<td>• True consumer choice is often limited by lack of a full insurance and product market, leading to (a) adverse selection (signing on only the better-off, working age, and healthy), (b) moral hazard (members making unnecessary claims because they have insurance coverage), (c) free-rider effect (households waiting until they think they will be sick before joining), and (d) information asymmetry (for example, concealing pre-existing conditions).</td>
</tr>
</tbody>
</table>

**Source:** Bennett, Creese, and Monasch (1998); Carrin, Desmet, and Basaza (2001).
Exclusions and limits on the benefits of schemes have implications for equity in the utilization of services. In schemes that cover catastrophic costs of care, setting certain exclusions may be essential to guard against adverse selection. However, these exclusions are likely to affect more vulnerable groups, such as the elderly, women, children and the poor.

The role of government

Policy-makers should recognize that the revenue-raising potential of rural risk-sharing schemes, particularly in very poor countries, is likely to be limited. Thus, they should not set ambitious cost recovery targets under such schemes.

The evidence from most of the schemes suggests that cost recovery levels under community insurance are likely to be limited in most developing countries. Like user fees, insurance should be seen as a way to top up government budgetary funding and to strengthen management of the health system. In countries where rural schemes are widespread and have been integrated into national health insurance programmes, there are substantial government contributions to the scheme and often also substantial co-payments. The preferred government strategy depends principally on the ownership of provider units. In instances where the private sector is dominant, the government subsidizes the fund or poor households buy into the fund. But by contributing directly to the fund, rather than to the provider, governments can help develop effective purchasing power and strengthen fund management. Government’s general revenue financing can be used to solve some of the problems associated with community health insurance. For example, it can be used to purchase health services for the poor or to offset regional inequities. Government’s capacity to do this depends on whether it is subsidizing the minority in the top-tier or the majority of the population in the lower tier of the income pyramid.

The report of the Commission on Macroeconomics and Health (CMH) set up by WHO in 2000 under the chairmanship of Prof. Jeffrey D. Sachs encourages governments to invest more in health. It has attempted to establish a link between improvement in health and economic development and poverty alleviation. It undertook several studies round the world which throw up certain important assumptions. Some of these are:

- The level of health spending in low-income countries is generally insufficient to address the health challenges they face.
- Poor countries can increase the domestic resources that they mobilize for the health sector and use those resources more efficiently. Even with more efficient allocation and greater resource mobilization, the levels of funding necessary to cover essential services are far beyond the financial means of many low-income countries.
- An effective assault on diseases of the poor will also require substantial investments in global public goods.
- Increased health coverage of the poor would require greater financial investments in specific health sector interventions, as well as properly
structured health delivery systems that can reach the poor.

- Coordinated actions by pharmaceutical industry, governments of low-income countries, donors and international agencies are needed to ensure that the world's low-income countries have reliable access to essential medicines. Donor finance will be needed to close the financing gap, in conjunction with best efforts of the recipient countries themselves.

Thus, the CMH stresses that community financing does not offer a complete solution to the low resources for health in the developing countries. "They should be regarded as a complement to - not as a substitute for, strong government involvement in health care financing and risk management related to the cost of illness". Therefore, community financing programmes should be supported by public funding. Government's general revenue financing can be targeted towards subsidies for the poor. Government can also assist in building management capacity at local levels and help communities by providing information on better options for investment of user fees and prepayments. It can also help in strengthening links with provider networks.

Development of a Policy Framework and Operational Guidelines

By their nature, most insurance schemes are independent local efforts. However, in countries that have had the most success in increasing community insurance coverage (China, Indonesia, Thailand) the schemes have operated within a clearly-defined policy framework and have often benefited from specific operational guidelines. Thus, a number of important roles emerge for government in the development of risk-sharing schemes. Some of the areas where feasible guidelines can be worked out include the following:

Training and capacity-building

Many countries have developed training packages to help community members manage insurance schemes. Such training packages help ensure that lessons learnt by one community are passed on to others.

Ensuring accountability of fund holders

With increased decentralization, particularly the establishment of autonomous health care facilities, there are critical questions regarding who the health insurance fund managers are responsible to. Where funds are owned by government, cooperatives, or communities these issues may be less pressing, but for funds owned by NGOs and facilities, the lines of accountability to beneficiaries may be extremely weak. Government must ensure that fund managers are accountable.

Lessons From Community Financing Experience

Context matters

Some schemes have come into existence in response to economic and political crises (Rwanda, Democratic Republic of Congo). The success of others has been facilitated by

* Jamison Dean T. Health Financing for Poor People. Foreward. 2003.
economic factors (Korea) or terminated by them (China). The external environment has an influence on whether and what type of risk-sharing initiative might be propitious, and on the replicability within a country or transferability between countries of such experience. A consideration of context provides a wider opportunity to review how the overall risk-sharing function in health is being implemented, including the use of tax-based health expenditure by government and other public and private schemes.

Design

The design of a scheme is critical. It is tempting to conclude that the experience with community risk-sharing has been a litany of disasters because there were fundamental design flaws in many of them. Many of these flaws appear obvious, but corrective mechanisms continue to elude the people designing and implementing the schemes.

Consumer preferences

A substantial amount of the literature on community health insurance focuses on whether demand exists among informal sector workers and rural people for health insurance. In cases where health facilities are charging substantial amounts for care, it would seem to be natural that demand for health insurance does exist. Yet schemes have hardly rooted their design in a survey of consumer demand or evaluated whether schemes match people’s expectations.

Adverse selection

Some of the ways to ensure against adverse selection include:

- Making the household or even the village the unit of membership;
- Making the scheme compulsory (although this does not seem to be feasible in many contexts);
- Stipulating that a certain portion of households in the village must join the scheme before the village enters the scheme (as is done in India’s Kasturba Hospital Scheme), and
- Preventing people with pre-existing conditions from registering, or limiting the benefits available for such conditions (although the advantages of such measures need to be weighed against the equity implications).

If enrolment throughout the year is allowed, a waiting period should be established before services can be accessed. Households should not be able to join the scheme when they get ill and decide to seek care. Although most schemes recognized this in their initial design, in many cases, few people were enrolled at the end of the registration period, which was extended in the hope that more people would join. Administrative capacity is required to manage necessary waiting periods.

Supporting the referral system

Many schemes, particularly hospital-owned schemes, have paid little attention to the effect they have on other levels of the health care system. Such a segmented approach adversely affects not only the providers excluded from the scheme but also the providers in the scheme. Referral systems
exist to ensure that patients are treated in the most appropriate and cost-effective manner and to protect the financial viability of hospitals. Insurance schemes cannot afford to ignore these issues.

**Investment Strategy**

An investment strategy should be developed for funds prior to receiving them. In high-inflation environments, delays of even a few months can quickly deplete insurance funds. An investment strategy is essential to guard against erosion of funds.

**Conclusions**

Community risk-sharing behaviour has been well entrenched in the social and cultural ethos in several less developed countries. Various cost-sharing schemes have mushroomed in these countries with the aim of increasing the access to essential drugs and diagnostics. However several of these initiatives have exclusion criterion and problems of financial sustainability. In most cases the technical capacity of community members to administer the scheme and manage funds is inadequate. Moreover evidence on the performance of these schemes is quite limited. Further research would be needed in this regard*.

In an era of rapid globalization and liberalization of multilateral trade and commerce, the concept of community risk-pooling and cost-bearing is to be seen not just in terms of financing health care but in a larger canvas of poverty eradication. The institutionalization of such community-based initiatives will not only play a vital role in providing adequate health care to the disadvantaged but would also enable trickle-down and more effective translation of sound health policy to action. In order to thus develop as a credible alternative, the schemes will have to receive strong budgetary support from the government and/or donors.

However, in the context of the ineffectiveness of both the public sector and markets in financing health care, the involvement of communities is a critical first step towards the provision of adequate health care for the poor in the rural and urban areas. Community risk-sharing arrangements are being increasingly recognized as a transitional response to the constraints many countries experience in rapidly extending financial risk protection to their populations. Given the evidence so far, the beneficial impact of these schemes on the health system can be clearly assumed**.


References


38. SEWA (Self Employed Women’s Association) Brochures, 2004


Avian (Bird) Flu

The Ministry of Public Health, Thailand informed WHO on 23 January 2004 of two confirmed cases of Influenza A, H5N1(Avian Flu) in Thailand. These were the first cases reported in WHO’s South-East Asia Region. The Thai Health authorities sought WHO’s technical support and collaboration in this matter. A team of experts was constituted at WHO/HQ in Geneva, and later be sent to Thailand to work closely with the Thai Government.

The Regional Office established a Task Force to deal with the problem and all WHO Representatives in the Member countries were alerted.

A few days prior to the outbreak in Thailand, cases of Avian Flu in humans were reported in Vietnam. There were further reports of outbreaks of Avian Influenza in poultry across the Region, and this meant that there were greater opportunities for the disease to be transmitted to humans. The reported symptoms of Avian Influenza in humans have ranged from typical influenza-like symptoms (fever, cough, sore throat and muscle aches) to eye infections, pneumonia, acute respiratory distress, viral pneumonia, and other life-threatening complications.

While Bird Flu outbreaks are a regular occurrence, the size and scope of the outbreak in Thailand were atypical. WHO’s objective was to reduce the risk to humans from Avian Influenza, particularly to prevent the strain from recombining with a human influenza virus in which case it would become more transmissible among humans. WHO acted swiftly to support countries so that everyone in contact with affected poultry was adequately protected. It also advised health authorities to increase their surveillance of affected poultry flocks. WHO has taken the lead in developing a vaccine for this strain.

Intercountry Consultation on TB Control in the Workplace, 19-20 February 2004

An intercountry consultation on TB Control in the Workplace was inaugurated by the Regional Director, on 19 February 2004. Highlighting the worldwide concern on TB’s continuing challenge to public health, the Regional Director stated that poverty, increasing migration, homelessness and the compulsions to live and work in high-risk environments were making people increasingly susceptible to the disease. At many workplaces, employees functioned in cramped and poorly ventilated environments, exposed to a high risk of acquiring the disease from those with active TB. The workplace, therefore, was one of the most appropriate settings to implement DOTS, which addresses the health concerns of a
large and vulnerable group in the population.

Important reasons were enumerated which made it imperative for the business sector to control TB, as the costs to employers were manifold. These related to disruption of work and reduced productivity due to prolonged periods of illness, medical expenses incurred on behalf of employees, and, in addition, significant indirect costs related to replacement and retraining of workers. "DOTS is a cost-effective strategy to meet this challenge. In partnership with the national TB programme as well as with NGOs and socially conscious corporate bodies, a programme to make DOTS accessible to such workers is urgently needed", emphasized the Regional Director.

In conclusion, the Regional Director stated that “this consultation, aimed at enlisting the business sector to extend the reach of national DOTS programmes, is definitely a landmark towards the TB control targets set for 2005, and the millennium development goals set for 2015. Together with national TB programmes in Member Countries, an enlightened and committed workplace management, and dedicated staff and trusting employees, we can achieve our targets.”

**Dr Samlee Takes Over as Regional Director**

Dr Samlee Plianbangchang took over as the new Regional Director of WHO South-East Asia Region on 1 March 2004. Dr Samlee, a national of Thailand, was born in 1940. He graduated from medical and public health colleges in Thailand and the United States. He started his career as a medical officer in 1965 and held various health-related positions in Thailand.

From 1984 to 2000, Dr Samlee served at WHO in different capacities at Headquarters in Geneva and in the South-East Asia Region, including as Deputy Regional Director from 1999 to 2000 in SEARO. Before taking up the position of Regional Director, Dr Samlee was working as Dean, College of Public Health, Chulalongkorn University, Bangkok and Adviser to the Minister of Public Health, Thailand. He has published extensively in leading technical and academic journals, and has received several awards in recognition of his extensive work in the public health sector.

Addressing all SEAR staff in the Conference Hall of the Regional Office on 1 March 2004, Dr Samlee expressed gratefulness to the Member States of the Region for having reposed confidence in him by electing him as the Regional Director of WHO South-East Asia Region. Spelling out very clearly the enormous and formidable challenges facing the Region, Dr Samlee went on to share with all staff his perspective of and plans for the concerted efforts that would be required for overcoming and surmounting those challenges. Some of the challenges that would engage the Regional Director’s special attention are:

- Asserting and earning WHO leadership in health in South-East Asia;
• Strengthening external relations, partnerships and resource mobilization;

• Advocating for the central role of health in social and economic development;

• Further strengthening WHO’s technical capability and capacity in order to act more proactively and to respond more effectively to the needs of the individual Member States;

• Strengthening WHO country presence by delegating more authority to WHO representatives, making them work more horizontally; and moving technical expertise closer to the countries when needed;

• Further promoting intercountry cooperation, with particular attention to joint endeavours to tackle priority health problems in the border areas, and

• Strengthening collaboration with other regions, especially the Western Pacific Region, through interregional activities in the areas of common interest.

“Certainly, all these, as well as other tasks will need to be pursued in close collaboration with all levels of the Organization and within the overall policy guidelines framed by the Director-General. As I had pledged earlier, and I reiterate, I will ensure that our Region continues to be an integral part of “One WHO”, whereby Headquarters, the Regional Office and Country Offices work in unison to achieve our common goals with Member States. We will spearhead the organizational changes, such as decentralization as planned by the Director-General. We need to be innovative and bold in our decisions and efforts to enhance the impact of our work in the Region”, asserted Dr Samlee.

Dr Samlee concluded by saying, “I would like to reiterate that I am truly happy with this rare opportunity to do something concrete for the health and well-being of people in our Region. Of course, no individual can do this alone. It has to be a collective endeavour. Since I am not a stranger, but already a member of the SEARO family, I am aware of our strengths and weaknesses. While looking forward to your continued understanding, support and cooperation, I assure you of my fullest consideration in enabling you to fulfil your tasks to serve our Region more effectively. Each one of us has a role to play. I am sure we will all endeavour to do our best to live up to any expectations.

For much too long, the South-East Asia Region has been seen as the leader in disease burden. I am confident that we have the means, and certainly the determination to emerge as a leader in health development. I invite you all to join me in making this possible. I know we can do it. Let us show the world we can do.”

Second Stop TB Partners’ Forum: 24-26 March 2004, New Delhi

The Second Stop TB Partners’ Forum was inaugurated by His Excellency Mr Atal Bihari Vajpayee, Prime Minister of India, at a
glittering ceremony held at Vigyan Bhawan, New Delhi on 24 March 2004. Over 200 participants, including Dr Shigeru Omi, Regional Director, WHO Western Pacific Region, and ministerial delegations and Stop TB organizational partners, etc. attended the Forum.

Presenting his keynote address on the occasion, Dr LEE Jong-wook, WHO Director-General said, “There are nine million reasons for being here today. Nine million people developed tuberculosis last year, and two million of them died. We are here to see what has been done and what must be done to control this disease that is causing so much suffering and loss of life. We have a global partnership to Stop TB. We have a strategy for achieving it, called the DOTS strategy. And we have global targets. During the last ten years, there has been great progress towards reaching those targets, but we have to do much more if we are to reach them, added Dr LEE.

Addressing the distinguished gathering, Dr Samlee Plianbangchang, Regional Director, WHO South-East Asia Region, recalled his long association with the TB control programme.

And appreciating the progress made over the last few years, he added, “I am happy to say, we have come a long way. DOTS coverage has increased eight-fold, from 10% to 80%. Today, over a billion people in the Region have access to DOTS”.

“We are happy that we have a strong relationship with several donor countries and development agencies, many of whom are represented here. They are playing a crucial role in TB control in the Region. The Member Countries have also benefited from the recent global initiatives such as Global Fund to fight AIDS, TB and Malaria (GFATM) and the Global Drug Facility (GDF). The control of TB remains a top priority for us. We must do everything possible within our reach to achieve the targets for TB control set for 2005 and contribute towards the Millennium Development Goals set for 2015. We must ensure adequate resources to enable national health programmes to consistently deliver quality services. I will continue to engage the Health Ministers of our Region in TB control by including this topic in the agenda of their annual meetings. I plan to accord TB control my highest priority and follow my friend, Dr Shigeru Omi, Regional Director, WHO Western Pacific Region, in establishing Stop TB as a WHO special programme in the SEA Region. I will urge Member Countries to build and expand partnerships with communities and to learn from them how to widen the reach of DOTS. We cannot hope to do anything effectively for the people if they are not part of the whole process,” cautioned Dr Samlee.

“I recognize that Stop TB is an excellent example of partnerships and something that other programmes can learn from. Last year, we in the Region established a regional partnership to stop TB with a broad range of stakeholders. We will, in addition, continue to make every effort to strengthen our collaboration through our regional associations – SAARC, ASEAN and ESCAP – and with international organizations and donor agencies. Our contribution to TB control in the Region reflects the core
function of WHO and the areas of our comparative advantage. Dr Omi and I have already discussed this and we will work diligently together to strengthen collaboration between our regions.

Finally, I would like all of us to re-affirm our commitment to Stop TB and thereby gift our children a TB-free world! “, concluded the Regional Director.

**First Regional Consultation on the Revision of the International Health Regulations**  
**WHO/SEARO, 13-14 April 2004**

The Regional Director, Dr Samlee Plianbangchang inaugurated the First Regional Consultation on the Proposed Revision of the International Health Regulations on 13 April 2004 in the Regional Office. Addressing the participants, Dr Samlee said that the International Health Regulations (IHR) were the only legally-binding instrument to prevent the trans-boundary spread of infectious diseases. The fundamental principles of the Regulations were to provide security against the international spread of diseases while avoiding unnecessary interference with international traffic, travel and trade. The existing IHR, which had been in force since 1969, had become out of date and needed urgent review and revision, given the numerous changes worldwide, including epidemiological changes, changes in disease patterns and genetic changes, coupled with the rapid advancement in information, communication and transportation technology. The urgent need for review and revision of IHR had been clearly demonstrated by the recent outbreaks of diseases, like SARS and avian influenza.

“I fully realize the enormous task involved in developing the revised IHR and the challenges involved in implementing these Regulations. We have to keep in mind that IHR is a very important instrument for protecting global public health, including our own health. The benefits our Member countries will derive from the effective implementation of the revised IHR will be well worth the efforts we put in. With our invaluable inputs and the commitment of our Member countries to international public health, we will succeed on our part in contributing to the achievement of the goal of this global exercise”, Dr Samlee concluded.

**World Health Report - Changing History**

“Too little emphasis has been placed on treatment programmes as a way to fight HIV/AIDS in the developing world,” the World Health Organization said in its ‘World Health Report – Changing History’, released early this year.

Global investment in the fight against AIDS has reached unprecedented levels, with $20 billion pledged from donor countries and through multilateral funding agencies including the Global Fund to Fight AIDS, Tuberculosis and Malaria. These resources should go to prolonging the lives of HIV/AIDS sufferers, who number between 34 and 46 million worldwide, the UN health agency said.
"The challenge now is to coordinate all our efforts and to ensure that this money benefits the people who need it most," said WHO’s Director-General Dr LEE Jong-wook.

WHO is working with partners, including national health officials, treatment providers, community groups and HIV/AIDS sufferers, to expand treatment in countries where the HIV/AIDS burden is heaviest.

The report also says local and national AIDS treatment programmes can stimulate investment in broader health services, bolstering the fight against other diseases.

"Future generations will judge our era in large part by our response to the AIDS pandemic. By tackling it decisively, we will also be building health systems that can meet the health needs of today and tomorrow. This is a historic opportunity we cannot afford to miss," said Dr LEE Jong-wook.

31 May - World No Tobacco Day 2004

The World Health Organization launched this year’s campaign for World No Tobacco Day with the slogan: Tobacco and Poverty: a vicious circle, stressing the enormous economic costs of tobacco use and cultivation to families, communities and countries.

The slogan ‘a vicious circle’ explains the inextricable link that exists between tobacco and poverty, and how the use of tobacco, especially by poorer people who consume this product the most, can cause harmful consequences to their already precarious economies and income.

"There has been tremendous progress on tobacco control, thanks to the efforts made by many governments and civil society," said Dr LEE Jong-wook, Director-General of WHO. "But the efforts must continue: every 6.5 seconds one person dies and many others fall ill or suffer diseases and disability due to tobacco use. The world cannot accept such easily preventable human and economic losses," Dr LEE added.

Studies across all the regions in the world show that it is the poorest people who tend to smoke the most in both developing and developed countries, and who bear most of the disease burden.

Many studies also show that poorer people spend a higher percentage of their household income on tobacco products, to the detriment of other basic needs such as food, health care or education. In Bangladesh, for example, 10.5 million people currently malnourished would have an adequate diet if two thirds of the money spent on tobacco in the country was spent on food instead. Tobacco can also have an adverse impact on countries’ economies.

WHO also highlights in this year’s campaign that an overwhelming majority of small tobacco farmers, especially in developing countries, live in poverty. "A big part of the health and economic costs related to tobacco are endured by small farmers and their families that grow the tobacco crop. Precarious labour conditions, including the use of child labour and exposure to highly
toxic products, and a highly negative impact on the environment make tobacco an issue inextricably linked to poverty and other development issues," said Dr Catherine le Galès-Camus, Assistant Director-General, Noncommunicable Diseases and Mental Health, WHO.

Today, WHO notes that the tobacco epidemic is still expanding, especially in developing countries where, currently, 84% of the smokers live. Tobacco use kills 4.9 million people each year, and this toll is expected to double in the next 20 years. At current rates, the total number of tobacco users is expected to rise to 1.7 billion by 2025 from 1.3 billion now.

To celebrate World No Tobacco Day, the Ministry of Health of Brazil and WHO are launching a two-day celebratory event in Brasília, Brazil, while thousands of other activities and celebrations are taking place around the world.
Book Review

The Selection and Use of Essential Medicines

This report presents the recommendations of the WHO Expert Committee responsible for updating the WHO Model List of Essential Medicines. The first part contains an update on the revised procedures for updating the Model List and the development of the WHO Essential Medicines Library. It continues to present a summary of the Committee’s considerations and justifications for additions and changes to the 12th Model List, including its recommendation to add ten antiretroviral medicines. The annexes include the 12th WHO Model List of Essential Medicines in its usual presentation and, for the first time, in the five-level Anatomical Therapeutic Chemical (ATC) classification system.

The Injury Chartbook
[ISBN 92 4 156220 X; Sw.fr.30.- / US $ 27]

Both of these publications highlight that injuries kill more than 5 million people worldwide each year, accounting for nearly 1 of every 10 deaths globally. In addition, tens of millions of people visit emergency departments annually due to injury. Whether they are unintentional -- resulting from incidents such as road traffic collisions, drowning or falls -- or intentional -- following an assault, suicide or war-related violence -- injuries affect people of all ages and economic groups.

Both publications reveal some striking findings on the nature and extent of death and illness as a result of injury. In addition to the considerable number of deaths, millions more are wounded or suffer other non-fatal health consequences due to injuries. The magnitude of the problem varies considerably by age, sex, religion and income group.

World Report on Road Traffic Injury Prevention
[ISBN 92 4 156260 9; Sw.fr.30.- / US $ 27]

The World Health Organization and the World Bank have jointly produced this report. Its purpose is to present a comprehensive overview of what is known about the magnitude, risk factors and impact of road traffic injuries, and about ways to prevent and lessen the impact of road accidents. The report is the outcome of a collaborative effort by institutions and individuals. Over 100 experts, from all continents and different sectors -- including transport, engineering,
health, police, education and civil society - have worked to produce the report.

Road traffic injuries are a growing public health issue, disproportionately affecting vulnerable groups of road users, including the poor. But road traffic accidents and injuries are preventable. Road traffic injury prevention must be incorporated into a broad range of activities, such as the development and management of road infrastructure, mobility planning, the provision of health and hospital services, and urban and environmental planning.

The time to act is now. Road safety is no accident. It requires strong political will and concerted, sustained efforts across a range of sectors. Acting now will save lives.

Manual of Basic Techniques for a Health Laboratory
[ISBN 92 4 154530 5; Sw.fr.50.-/US$ 45.]

This new edition of a very popular laboratory manual published by WHO in the 1980s includes new procedures and technologies developed since the previous edition that have proved useful to small laboratories in developing countries, while some obsolete procedures have been replaced by more up-to-date techniques. The manual provides a practical guide to the safe and accurate performance of basic laboratory techniques. Intended for use by laboratory technicians working in peripheral-level laboratories in developing countries, the book emphasizes simple, economical procedures that can yield accurate results where resources, including equipment, are scarce and the climate is hot and humid.

The book is divided into three parts. The first describes the setting-up of a peripheral health laboratory and general laboratory procedures, including use of a microscope and laboratory balances, centrifugation, measurement and dispensing of liquids, and cleaning, disinfection and sterilization of laboratory equipment. The second part describes techniques for examining different specimens for helminths, protozoa, bacteria and fungi. The third and final part describes the examination of urine, cerebrospinal fluid and blood, including techniques based on immunological and serological principles. Numerous illustrations are used throughout the book to clarify the different steps involved. A summary of the reagents required for the various techniques and their preparation is provided in the annex.

Policy Tools for Allocative Efficiency of Health Services
[ISBN 92 4 156252 8; Sw.fr.20.- / US $ 18.-]

Health care should be provided efficiently, given the potential gains for patients and the population, and the high cost of some kinds of care. Emphasizing the most cost-effective services can in principle attain the greatest health gains. Policies are implemented through tools available to policy-makers, particularly those in government who can influence not only public expenditure and service delivery but also how private insurers and providers allocate resources among diseases and individuals.

Policy Tools reviews an enormous research literature and aims not only at what policies to recommend but at what it takes to make them effective.
Attaining The Millennium Development Goals In India: Role of Public Policy and Service Delivery - World Bank

[Hardcopy available on loan at: SEARO Library]

Since the launch of the Millennium Development Goals (MDGs) at the Millennium Summit in New York in September 2000, the MDGs have become the most widely-accepted yardstick of development efforts by governments, donors and NGOs. The MDGs are a set of numerical and time-bound targets related to key achievements in human development. They include halving income-poverty and hunger, achieving universal primary education and gender equality, reducing infant and child mortality by two-thirds and maternal mortality by three-quarters, reversing the spread of HIV/AIDS and other communicable diseases, and halving the proportion of people without access to safe water. These targets are to be achieved by 2015, from their levels in 1990 (United Nations 2000).

This report focuses on the attainment of five major human development related MDGs by sub-national units in India - child and infant mortality, child malnutrition, schooling enrollment and completion, gender disparities in schooling, and hunger-poverty (as reflected by inadequate calorie intake).

This report concludes that while substantial progress could be made by the poor states on increasing the rates of net primary enrollment and primary completion, it will be challenging for them to attain the education-related MDGs of 100% net primary enrollment and 100% primary completion.
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 May-June issue of the Forum is dedicated to the World Health Day theme of the year, which is mentioned in the December issue. Readers may send contributions relating to the theme for inclusion in the special issue.

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@whosea.org).

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 with a diskette and a printout in double space, and
- not normally exceed 3000 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 the Authors

Authors are responsible for:

- ensuring that their contributions contain accurate data and references (and are requested to check the accuracy of both before submission);
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/projet 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.

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• A reference to a contribution in a book should include the chapter title and page range.

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