

Volume 13, Number 1, 2009

Special Issue: World Health Day 2009
Save lives: make hospitals safe in emergencies

REGIONAL HEALTH FORUM

WHO South-East Asia Region



**World Health
Organization**

Regional Office for South-East Asia

Volume 13, Number 1, 2009

Special Issue: World Health Day 2009
Save lives: make hospitals safe in emergencies

REGIONAL HEALTH FORUM

WHO South-East Asia Region



**World Health
Organization**
Regional Office for South-East Asia

ISSN 1020 4237
© World Health Organization 2009

Publications of the World Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. For rights of reproduction or translation, in part or in toto, of publications issued by the WHO Regional Office for South-East Asia, application should be made to the Regional Office for South-East Asia, World Health House, Indraprastha Estate, New Delhi 110002, India.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication are those of the author(s) and do not necessarily reflect the decisions or stated policy of the World Health Organization; however they focus on issues that have been recognized by the Organization and Member States as being of high priority.

Printed in India

Editorial

The first five articles in this edition of the Regional Health Forum are based on the theme of World Health Day 2009: Health Facilities in Emergencies. The articles discuss the theme and its various aspects such as: methodologies for assessing structural and non-structural vulnerability of health facilities; community involvement and multi-stakeholder participation; health workforce preparedness; and the critical role of primary health care in disaster risk reduction.

The theme being multifaceted, the articles based on it represent the variety of issues surrounding efforts to keep health facilities safe from disasters. The Sustainable Environment and Ecological Development Society (SEEDS), India presents its experience with a comprehensive pilot project for public health hospitals undertaken in Gujarat state, with the key focus on its inclusive approach for various stakeholders. This is a key strategy for sustainability.

“How do we measure safety?” has always been a question for all practitioners of disaster risk management. The WHO Regional Office for the Americas (AMRO)/The Pan American Health Organization (PAHO) and the National Society for Earthquake Technology (NSET), Nepal present tools and discuss the methodologies for addressing this question. PAHO describes the development of the Hospital Safety Index while NSET explains in detail the creation and testing of a country-appropriate methodology for structural and non-structural assessments.

Of course, a health facility is more about people, the ones who work to serve the ones who need them. From the perspective of a community-based organization in Nepal, the health workforce at various levels of care needs several skills and competencies. In this context, therefore, the article discusses aspects of preparedness, training, planning and organization.

The last article elaborates the link between disaster risk reduction and primary health care. It discusses the impact that disasters and emergencies have on the health systems. It also provides examples to show that investments made in primary health care help provide better response and thereby protect the health of people during disasters.

Contents

Protecting health facilities from disasters

Enhancing stakeholder participation in ensuring safe health facilities: An initiative in Gujarat, India <i>Shivangi Chavda, Paula Silva and Manu Gupta</i>	1
The Hospital Safety Index <i>Patricia Bittner</i>	8
Methodology for assessing seismic vulnerabilities of health facilities <i>Amod Mani Dixit and Ramesh Guragain</i>	11
Emergency preparedness of the health workforce for primary health care facilities <i>Khem B. Karki</i>	21
Disaster risk reduction through strengthened primary health care <i>Roderico H. Ofrin and Ilsa Nelwan</i>	29

Communicable diseases

Qualitative study on avian influenza in Indonesia <i>Soewarta Kosen, Rachmalina S. Prasodjo, Khanchit Limpakarnjanarat, Oratai Rauyajin and Nugroho Abikusno</i>	35
---	----

Comment

Notes and news	48
Publications corner	55

Guidelines for contributors	59
------------------------------------	-----------

Protecting health facilities from disasters

Enhancing stakeholder participation in ensuring safe health facilities: An initiative in Gujarat, India

Shivangi Chavda, Paula Silva** and Manu Gupta****

Abstract

Realizing the challenge of keeping hospitals safe and functional during disaster situations, an initiative that aims to promote disaster awareness, and help to devise hospital disaster prevention plans, has been initiated in the State of Gujarat, India. The “Hospital Safety Initiative” is in line, and reflects the spirit of the United Nations International Secretariat for Disaster Reduction (UNISDR)–World Health Organization (WHO) Global Campaign 2008–2009 of “Keeping Hospitals Safe from Disasters”. The authors are part of the team piloting the initiative in four public hospitals. The methodology of the initiative was drawn taking into consideration the impacts of disasters faced by hospitals in countries of South-East Asia, such as during the tsunami. The methodology is encapsulated in the “Circle of Safety Approach” that is presented in this article. Hospitals being the lifeline for local communities during disasters, it is imperative that their authorities’ participation in the disaster preparedness process is facilitated. Hospitals are not normally geared to remain functional during the event of disasters. The initiative therefore is based on the premise that the needs of the community in a disaster situation, often a question of life and death, cannot be compromised. Therefore the best possible means need to be evolved so that health facilities are able to provide the functions when they are needed the most. The article describes the involvement of various stakeholders in the process of evolving the Hospital Disaster Prevention Plan. This includes joint assessment of risks, preparation of preparedness plans, functional continuity plans and mitigation plans. Lessons learnt from this pilot would provide important inputs into framing a comprehensive policy for development and continued functionality of health facilities even during the most critical times.

Hospital safety: The premise

Hospitals are a symbol of faith for communities. They are not only expected to provide good medical care but also to be in a position to offer critical assistance to local communities at the time of disasters. It is therefore absolutely vital that they remain functional even during the worst of times. To ensure this, the lives of health staff, along with

equipment, drugs and buildings must be secured at all costs.

Moreover, disasters that damage health systems affect a country’s ability to achieve the UN Millennium Development Goals. Gains achieved in development and access to health-care services are seriously compromised when disasters occur.

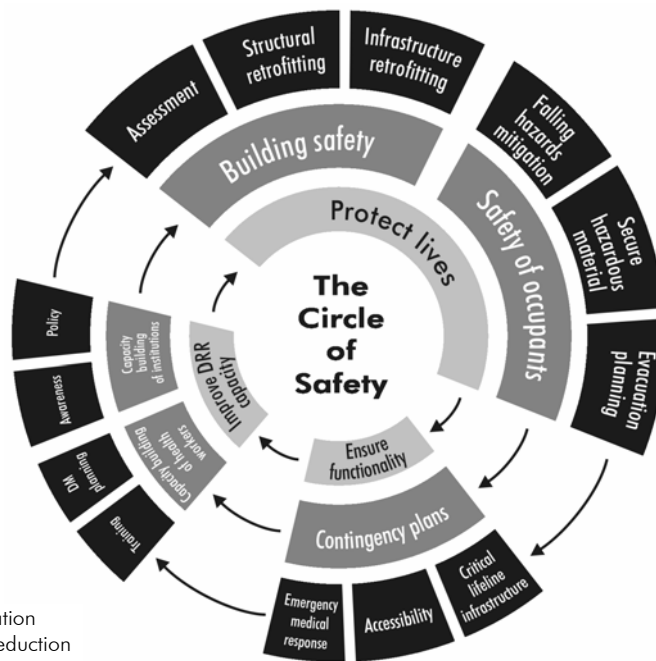
The ongoing World Disaster Reduction Campaign 2008–2009: “Keeping Hospitals Safe from Disasters”, launched by the UNISDR and WHO, with support from the World Bank, provides an opportunity for raising awareness among stakeholders, both within the health sector and without, such as local governments and citizens.

* National Coordinator – Programme Implementation, Sustainable Environment and Ecological Development Society (SEEDS), 15 A, Institutional Area, Sector IV, R.K. Puram, New Delhi–110022

** Senior Programme Officer, SEEDS

*** Director, SEEDS

Figure: The Circle of Safety



The campaign is focused on structural safety of hospitals and health facilities, on keeping health facilities functional during and after disasters, and on making sure health workers are prepared for natural hazards.

The campaign aims to raise awareness and effect changes that will:

- Protect the lives of patients and health workers by ensuring structural resilience of health facilities;
- Make sure health facilities and health services are able to function in the aftermath of emergencies and disasters, when they are most needed; and
- Improve the risk-reduction capacity of health workers and institutions, including emergency management.

To coincide with the global campaign, Sustainable Environment and Ecological Development Society (SEEDS), as part of the

Asian Disaster Reduction and Response Network, and in collaboration with the Government of Gujarat, India is piloting the Hospital Safety Initiative. The initiative is being supported by UNISDR and the European Union, along with Oxfam, Australia.

In Gujarat state, the Hospital Safety Initiative therefore aims to contribute positively to the change desired in disaster preparedness of hospitals to meet the goals of the global campaign.

The Circle of Safety

The Gujarat Hospital Safety Initiative is based on the "Circle of Safety" (Figure) that denotes a three-pronged strategy:

- (1) Protect lives: The loss of lives in case of hospitals can be due to two main factors – one, due to structural failure, that is collapse of a building or parts of a building itself, and second, due to

falling hazards. Falling hazards are caused by non-structural elements of the building like partition walls and glass windows; by furniture and storage racks that may fall over people, and by equipment and other vital infrastructure that may break or get destroyed. Both – structural failure and falling hazards – can potentially cause injury or even death for a building's occupants. They can block exit routes, preventing timely evacuation. Hence, to ensure that buildings do not collapse and that the occupants are still protected from falling hazards, it is essential that appropriate structural and non-structural measures are carried out.

- (2) Ensure functionality: During an event of disaster, it is important that by all means the critical facilities/services such as the Intensive Care Unit, operation theatres and incubators for infants, etc. remain functional, not only for handling mass casualty situations, but also for occupants who may already be present at the time of disaster. Contingency plans to ensure functionality would comprise a set of actions for disaster preparedness. These actions constitute critical decisions taken by the hospital management through prompt and efficient communication, on ensuring that the hospital is ready to handle the surge of patients.
- (3) Improve risk-reduction capacities: Hospitals need to be aware of the risks having the potential of disasters in their surroundings, and should initiate measures needed to reduce them. If hospitals are located in a region vulnerable to an earthquake, the staff should be aware of its potential fallout. This translates into providing knowledge and training to staff and workers on the steps they can take as individuals in mitigating the level of damage. With a good capacity to handle disaster situations, hospitals will

be able to recover rapidly and thereby reduce the potential loss of lives in the community.

Experience of Gujarat

The devastating earthquake that struck the western State of Gujarat, India, in 2001 was one of the worst disasters of this decade. Several thousands lost their lives, while many more were injured. The earthquake also destroyed many critical services including 3812 health structures. The worst hit was the General Hospital in the city of Bhuj, near the epicentre of the earthquake. The hospital was completely destroyed and 200 patients were buried in the debris. This facility was the only one in about a hundred-kilometer radius and was expected to help the affected population during the earthquake. However, its own destruction led to many more loss of lives as the injured could not be treated in time. More recently, hospitals and health facilities were targets of terrorist attacks, causing loss of lives and panic among health workers and patients.

The Gujarat Hospital Safety Initiative: Methodological framework

Following the "Circle of Safety" approach, the Gujarat Hospital Safety Initiative (GHSI) is being piloted in four hospitals in four different districts of Gujarat – Ahmedabad, Rajkot, Porbander and Jamnagar. These districts are vulnerable to multiple natural hazards such as earthquakes, floods, cyclones and high tidal waves. Staff in selected hospitals are well aware of the disasters they have faced in the recent past; however there is limited knowledge on the preventive measures that can protect their facility in a disaster situation.

As part of the GHSI, each hospital would ultimately be able to devise a plan, which would help them in listing out: their own vulnerabilities and risks; the set of actions that need to be taken to prevent a disaster in the hospital, and steps that need to be taken to ensure that the hospital continues to function during disasters.

Implementing hospital safety

The first step in implementing hospital safety measures is the assessment of risk, that is the probability of harmful consequences, or expected losses (deaths and injuries, etc.) resulting from natural or human-induced hazards and vulnerable conditions. This is one of the most challenging, yet the most critical factor for hospital safety planning.

In Gujarat, risk assessment was carried out by a multidisciplinary team working closely with the staff of hospitals. Tools used in the process were typical of any disaster risk-reduction approach; however, they were adapted to serve in the context of hospitals and their peculiar characteristics. These tools included focus-group discussions, participatory workshops and joint monitoring and evaluation.

The assessment is initiated with an evaluation checklist for hospitals. The checklist is a tool prepared for field implementers to facilitate the collection of primary data that would help build the profile of the hospital and areas and facilities surrounding it, as well as specific details on structural, non-structural and overall capacity of the hospital to cope with disasters or with any emergency situation. The evaluation checklist is filled by the field worker, along with the key staff of hospitals such as matron, engineer and administrator. These people are permanent employees of hospitals and are also involved in maintenance of their critical services.

Based on the checklist, a “risk matrix” was developed (Annex) for the five key factors that would ascertain the vulnerability of the hospital as well as gauge its coping capacity in the event of a disaster. The five factors included (i) Percentage occupancy, (ii) Structural resilience; (iii) Non-structural resilience; (iv) Capacity of the hospital; and (v) Disaster management capability of the hospital. All these key factors are linked directly with the capacity of hospitals to display efficiencies during the time of disasters. The “risk matrix” is scaled on “high”, “moderate” and “low” risks

and is calculated on the basis of the weighted average method. The rating is determined on the basis of a “rate card” that is developed with the help of field experts. The “rate card” is a ready reference card prepared by experts to help field workers identify the level of risk, based on the observations recorded for the above-mentioned five factors. The levels of risk — “high”, “moderate” and “low” — are each assigned a numeric value for the purpose of calculations. This method also helps hospitals to identify their specific training and capacity building needs. The “risk matrix” and “rate card” help in classifying the levels of vulnerabilities within and among hospital buildings. Usually government hospitals have huge and complex structures and it is not practically possible to address the needs of each member of the hospital. Hence, in order to ascertain the needs of the most vulnerable wing or ward or building of a government hospital, the “risk matrix” becomes useful.

In the Gujarat earthquake, while 200 patients were buried under the debris of hospitals, the medical and administrative staff were also affected severely. The situation became more severe due to staff’s inadequate knowledge of disasters and the response needed for them, both of which were more complex than dealing with the usual mass casualties. Therefore, it is essential that the key stakeholders are oriented and trained to understand the basic impacts of disasters in the context of hospitals. The key stakeholders of hospitals who should be included in this process are: (i) the Apex Body members comprising Class 1 officers; (ii) the Executive Body members comprising Class 2 officers; (iii) doctors; (iii) nurses; (v) Class 4 officers such as ward boys and sweepers, etc.; and (vi) staff of the district health department.

The results of the risk assessment exercise form the baseline for subsequent activities, namely (i) the development of a customized version of the “Hospital Disaster Prevention Plan”; and (ii) training and capacity building of hospital staff.

Hospital Disaster Prevention Plan

The Hospital Disaster Prevention Plan basically aims to protect the lives of occupants and to increase the responding efficiency of hospitals. However, the focus is not *per se* on handling mass casualties, which is routinely practised by hospitals. Rather, it is on preparedness and mitigation measures against natural disasters. The preparation of the plan aims at systematizing and optimizing the efficiency of hospitals during the event of disasters. Preparedness plans act as a guide for all levels of staff of hospitals, and aim to strengthen the coping mechanism of hospitals. The content mainly includes details regarding the line of coordination and communication during the event of disasters; early warning mechanisms; the standard operating procedures for various sections and actors of the hospital building; and safe evacuation of occupants of the hospital building. The plans are developed on the basis of existing capacities of hospitals and their staff. In the case of a change in any structural or non-structural aspect, these plans have to be updated. The disaster prevention management team of the hospital has to ensure that the plans are upgraded periodically. The plans concentrate on the steps of disaster preparedness rather than on handling mass casualties. Hence, the aspects of strengthening of structural and non-structural elements, awareness-raising and safe evacuation are addressed in the plans that are developed in collaboration with the key stakeholders of hospitals whose inputs are incorporated. The views of field experts are also taken into account while developing these plans.

The plan preparation process includes:

- (1) Developing preparedness plans: Activities and measures are initiated in advance to ensure effective response to a disaster for which a warning may have been received. These include alert communication

mechanisms; and evacuation maps and plans for general, as well as, vulnerable categories of patients.

- (2) Developing functional continuity plans: Plans are developed for safety of occupants and staff members, as well as to ensure the safety and movement of equipments and patients during critical situations.
- (3) Developing mitigation plans: Structural and non-structural mitigation plans are developed for hospitals to ensure their safety against future disasters. These include plans to regularly generate awareness among hospital communities.

In Gujarat, developing plans for hospitals with accommodation ranging from 150 beds to 2000 beds has been challenging. Presently, plans are being developed in parts for specific departments to be eventually integrated into one centralized plan. Often, hospitals are spread over several buildings within the same campus. Their vulnerabilities and importance from the viewpoint of operational continuity vary with their designated use. Therefore, plans need to reflect the criticality involved in a disaster situation. The four hospitals selected in Gujarat have identified the most critical facility within their campuses for which plans are being developed on a priority basis.

Community's role in hospital safety

Public hospitals such as the ones being covered under the GHSI in Gujarat have a very large intake of patients, both indoor and outdoor. As part of the campaign, general awareness on disaster preparedness is also being disseminated to local communities being served by hospitals. This is because the community's role in ensuring overall safety of hospitals and their capacity to continue operations is important.

A good level of preparedness among local communities would ensure that there are fewer losses of lives and injuries. This can potentially decrease the load on hospitals handling mass casualties. Moreover, community representatives can serve as volunteer health workers, with prior training. As part of the GHSI campaign, basic skills including first aid, triage, search and rescue, and fire safety, are being imparted through training to communities that are within the catchment area of health facilities. Such training is imparted through community-level workshops and meetings, community-level plans and mock drills.

In Gujarat, the local network of community health centres and primary health centres has enabled a community-led disaster management initiative to run concurrently with initiatives being taken in hospitals. While both initiatives are being carried out independently, their outcomes are mutually reinforcing.

Challenges

The pilot implementation in selected hospitals has presented certain key operational challenges. A phenomenon that is common to most hospitals is that they are usually overoccupied with the result that their resources and capacities are always found to be inadequate. Although the importance of “hospital safety” is understood and acknowledged, due to lack of time, it is difficult to bring all the stakeholders together for orientation and implementation. Every hospital faces unique challenges depending upon the nature of services it provides. It was seen as a challenge during a particular intervention to make the hospital staff acknowledge the fact that patients in the orthopaedic ward required to be evacuated during an earthquake or flood; the notion that the position of orthopaedic patients cannot be changed remains strong among the medical staff. Setting up a post-care centre immediately

following a disaster, and ensuring the functionality of hospitals still remain challenges that need to be addressed. Such challenges have a direct impact on the lives of people. Furthermore, it is also economically challenging for hospitals especially when considerable expenditure has to be incurred on structural and non-structural mitigation. As funds for such expenditure are usually not budgeted in the annual plans, it becomes difficult to mobilize item.

Implementing hospital safety also calls for difficult decisions to be taken. Though anchoring life-saving equipments to the walls or floors will protect them from damage in a disaster, it would also hinder efficient operations by the medical staff. Often, compromises have to be made. Such decisions can have a direct bearing on the lives lost or saved.

Conclusions

In spite of the challenges, the Gujarat Hospital Safety Initiative provides opportunities to raise awareness among the key stakeholders of hospitals so as to improve their efficiency and capacity during an event of emergency. Also, the implementation process reveals the key weaknesses and vulnerabilities inherent in the complex nature of hospitals. Simplifying common requirements like putting signages, anchoring the equipments or roller-based tables, can help reduce the probability of a normal accident. Hence, basic steps in hospital safety can help to induce a culture of safety in hospitals. The GHSI has evolved from and is based on systematic risk-reduction approaches that are backed by tools that can be used to address the disaster preparedness needs of hospitals. It is aimed at “Keeping Hospitals Safe from Disasters” and it is expected that health departments and government functionaries institutionalize the process of its implementation in every government hospital.

Annex

Risk-rating matrix for hospital safety

Indicators	Weightage	Hospital 1		Hospital 2		Hospital 3		Hospital 4		Hospital 5	
		Rasul Khan Zaranana	Weightage	Pandit Dindayal	Weightage	KT Children Hospital	Weightage	Gulabchand Hospital	Weightage	Padma Kunwarba	Weightage
Percentage occupancy of the building	30 %	3	0.9	3	0.9	3	0.9	3	0.9	3	0.9
Subtotal [1]			0.9		0.9		0.9		0.9		0.9
Structural safety	15 %										
Condition of the building	3.75 %	2	0.075	2	0.075	2	0.075	1	0.0375	2	0.075
Building standards followed	3.75 %	2	0.075	2	0.075	2	0.075	2	0.075	3	0.1125
Structural resilience to hazards	3.75 %	3	0.1125	1	0.0375	2	0.075	2	0.075	3	0.1125
Accessibility of Hospitals	3.75 %	2	0.075	2	0.075	2	0.075	2	0.075	2	0.075
Subtotal [2]			0.3375		0.2625		0.3		0.2625		0.375
Non-structural safety	19.95 %										
Power back-up system	2.85 %	3	0.0855	1	0.0285	3	0.0855	3	0.0855	1	0.0285
Water storage	2.85 %	3	0.0855	2	0.057	2	0.057	3	0.0855	3	0.0855
Communication systems	2.85 %	3	0.0855	1	0.0285	2	0.057	2	0.057	2	0.057
Fuel storage	2.85 %	3	0.0855	0	0	3	0.0855	0	0	0	0
Medical gases	2.85 %	3	0.0855	1	0.0285	1	0.0285	0	0	3	0.0855
Medical and laboratory equipment	2.85 %	2	0.057	2	0.057	0	0	2	0.057	2	0.057
Architectural elements	2.85 %	3	0.0855	1	0.0285	2	0.057	2	0.057	2	0.057
Subtotal [3]			0.57		0.228		0.3705		0.342		0.3705
Capacity	10 %										
Adequate medical staff	2.50 %	3	0.075	2	0.05	2	0.05	3	0.075	2	0.05
Adequate beds	2.50 %	2	0.05	1	0.025	2	0.05	2	0.05	2	0.05
Adequate medicines	2.50 %	2	0.05	1	0.025	2	0.05	2	0.05	2	0.05
Adequate emergency facilities	2.50 %	2	0.05	2	0.05	2	0.05	3	0.075	2	0.05
Subtotal [4]			0.225		0.15		0.2		0.25		0.2
Disaster management aspects	24.96 %										
Mass casualty plans	4.16 %	3	0.1248	3	0.1248	3	0.1248	3	0.1248	3	0.1248
Evacuation maps and plans	4.16 %	3	0.1248	3	0.1248	3	0.1248	3	0.1248	3	0.1248
Emergency alarm systems	4.16 %	3	0.1248	3	0.1248	3	0.1248	3	0.1248	3	0.1248
Disaster management plans	4.16 %	2	0.0832	2	0.0832	2	0.0832	2	0.0832	3	0.1248
Trained medical staff	4.16 %	3	0.1248	3	0.1248	3	0.1248	3	0.1248	3	0.1248
Practise regular evacuation drills	4.16 %	3	0.1248	3	0.1248	3	0.1248	3	0.1248	3	0.1248
Subtotal [5]			0.7072		0.7072		0.7072		0.7072		0.7488
Grand total			2.7397		2.2477		2.4777		2.4617		2.5943

Source: SEEDS

The Hospital Safety Index

Patricia Bittner*

Preparedness alone is not enough

Latin America and the Caribbean have witnessed a host of major sudden-impact disasters in recent decades. However, the 1985 earthquake in Mexico City served as a critical turning point – a watershed moment. When the 7.6 magnitude earthquake struck in September of that year, Mexico City was already one of the world's largest metropolitan areas, and thanks to a well-trained workforce, Mexico's health services responded remarkably well. The recently-created metropolitan emergency plan was set in motion, the evacuation of damaged health facilities proceeded smoothly, and victims that needed treatment were redistributed throughout the metropolitan health system.

However, an important lesson was also learned in the wake of this disaster: preparedness alone was not sufficient. Nowhere was this lesson more clear than at Mexico's Juarez Hospital, where an entire wing of the 12-story tower collapsed. At that site alone, 561 patients, doctors and nurses lost their lives. Ironically as well as tragically, a good part of those very same health professionals were among the best prepared to respond to mass casualties. However no amount of preparedness could compensate for a hospital that proved unsafe in disaster situations.

Fast forward two decades to 2005, when 168 countries approved the Hyogo

Framework for Action (HFA) — a blueprint for building disaster-resilient nations. The HFA calls for all new hospitals to be built to a standard that enables them to withstand disasters and remain functioning.

Today, as a result of past and present country projects, it is commonly accepted that we can improve the safety of hospitals and health facilities in emergencies and disasters. Both the knowledge and the tools are at hand. A new evaluation method that is helping to achieve this goal is the Hospital Safety Index.

What is the Hospital Safety Index?

The Hospital Safety Index is an easy-to-apply evaluation tool that helps hospital directors or administrators determine the likelihood that their hospital or health facility can remain operational in emergency situations. It was developed by the Pan American Health Organization (PAHO/WHO), Regional Office for the Americas of the World Health Organization, with the support of the Disaster Mitigation Advisory Group. It is the result of a lengthy process of dialogue, testing and revision with PAHO/WHO Member States.

The Hospital Safety Index provides a snapshot in time of a hospital's level of safety. The Index can and should be reapplied a number of times, over an extended period, in order to continuously monitor safety levels. In that way, safety is not seen as an absolute state of 'yes-or-no' or 'all-or-nothing,' but rather as something that can be improved gradually. The Hospital Safety Index is not designed to replace detailed vulnerability

*Pan American Health Organization, Regional Office of the World Health Organization, 525 Twenty-third Street, N.W., Washington, D.C. 20037, United States of America

studies. However, because these can be very costly and time consuming, the Hospital Safety Index is a cost-effective first step.

The Hospital Safety Index is made up of three components: a safe hospitals checklist, a guide for evaluators, and a safety index calculator. Determining a hospital's safety index begins with applying the safe hospitals checklist. This standardized checklist examines the level of safety of 145 items or areas that have an impact on a health facility's level of safety. The safety level of each area is rated as low, medium or high. The areas assessed are grouped into four categories: the hospital's geographical location in relation to natural hazards; its structural and non-structural safety; and items that affect its functional capacity—issues such as whether a hospital has a disaster committee, an emergency plan, or if maintenance is performed regularly.

Before applying the checklist, a team of evaluators participates in a training course. The basis for this training is the Guide for Evaluators, a comprehensive document that discusses in-depth how to objectively evaluate each component or area of the hospital and clarifies the meaning of the scores assigned as part of the checklist. The profiles of team members can vary from country to country, but these generally comprise experienced professionals such as hospital staff (directors, physicians, nurses, maintenance personnel, and others) and can include outside specialists such as engineers or architects.

The team of evaluators works together or in small groups to assess the items covered by the checklist and once it has been completed, the team reassembles to discuss and agree upon the results.

Calculating a hospital's safety score

The final step of the process is to calculate the safety score using the Safety Index Calculator. Once the checklist has been completed and agreed upon by the team of evaluators, the data are entered into the calculator. The

calculator automatically weights the value that has been assigned to each area and generates a numerical score that places a hospital or health facility into one of three safety categories: high, medium or low.

A health facility that achieves a "high" level of safety, falling into category A, is likely to function in disaster situations. A facility falling into category B, or "medium" level of safety, requires intervention measures in the short term. Finally, those facilities that fall into category C, or "low" level of safety, require urgent intervention measures, as the hospital's current safety level is deemed inadequate to protect the lives of patients and staff during a disaster.

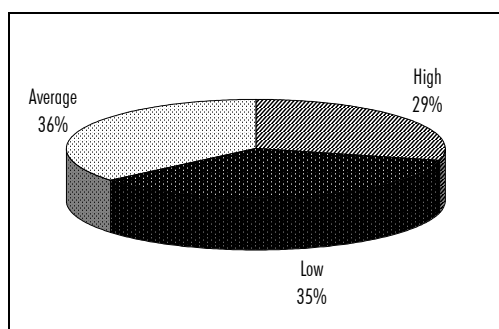
Figure 1: Hospital Safety Index Score

Category of components	Unlikely to function	Likely to function	Highly likely to function	Total
Structural	7.5	24.38	18.13	50%
Non-structural	10.36	10.98	8.67	30%
Functional	6.93	6.92	6.15	20%
Total	24.79	42.37	32.94	100%

The Hospital Safety Index can output the results in an easy-to-understand graphic format. In the hypothetical example presented in Figure 1, we see that the hospital's structural safety makes up 50% of the total score; the safety of non-structural elements corresponds to 30% of the total score, and functional safety comprises 20%. The raw scores for each category are given as a reference.

Figure 2 shows the further breakdown by category of components. For example, using the numbers in Figure 1 that correspond to the line on non-structural elements, we see that in this case, the results show that among the non-structural elements assessed, 29% are rated "high," in other words, they are highly likely to function (numerical value **8.67** in Figure 1); the safety of 36% of the elements assessed is considered average (numerical value **10.98**); and 35% are considered "low" or unlikely to function (numerical value **10.36**).

Figure 2: Safety of non-structural elements



What can countries do with the results?

The Hospital Safety Index yields an objective, numerical score. But what, exactly, can countries do with this information? The team of evaluators plays an important role. Prior to beginning the process, they will have met with hospital staff to explain the rationale and purpose of the “safe hospitals” programme in general and why it is important to apply this evaluation tool. Once the checklist has been filled out and the data entered into the scoring calculator, the evaluation team analyses and discusses the results with hospital staff and helps to interpret the score in terms of potential next

steps that a health facility can take to improve safety.

The Hospital Safety Index alone will not transform a vulnerable health facility into one that is disaster-resilient, with well-trained staff. Nor will applying the Hospital Safety Index replace costly vulnerability studies, which can run into tens of thousands of dollars. However, hospital administrators *will* get a solid overview of where the facility stands in terms of safety, helping them decide where to invest to maximize return. Sometimes very small or low-cost improvements (relative to the overall cost of the facility) will go a long way towards improving safety.

It is important that hospital administrators and health managers view the safety score in a positive light – which is why this instrument is called the “Safety” Index rather than the “Vulnerability” Index. The final score should not be viewed as a failing grade, but rather as a starting point for gauging how a health facility is likely to respond to major emergencies and disasters. This first but critical step is the cornerstone to ensuring that hospitals are safe from disasters and one that will contribute significantly to the Hyogo Framework for Action.

References and further reading

1. Hyogo framework for action 2005-2015: building the resilience of nations and communities to disasters. World Conference on Disaster Reduction, 18-22 January 2005. Kobe, Hyogo, Japan. International Strategy for Disaster Reduction, 2005. (<http://www.unisdr.org/eng/hfa/docs/Hyogo-framework-for-action-english.pdf> - accessed 27 March 2009).
2. Pan American Health Organization. Disaster Mitigation Advisory Group (DiMAG) of the Pan American Health Organization: <http://www.paho.org/english/dd/ped/home.htm>
3. Pan American Health Organization. *Hospital Safety Index: Evaluation Forms for Safe Hospitals*. Include general information about the health facility and safe hospitals checklist. Washington D.C. PAHO, 2008 (<http://www.paho.org/disasters/DD/PED/SafeHospFormsEng.pdf> - accessed 27 March 2009).
4. Pan American Health Organization. *Hospital Safety Index: Guide for Evaluators*. Washington, D.C.: PAHO, 2008. (<http://www.paho.org/disasters/DD/PED/SafeHosEvalu atorGuideEng.pdf> - accessed 27 March 2009).
5. Pan American Health Organization. *Publications catalog on emergencies and disasters*. Washington D.C. PAHO, (<http://www.disasterpublications.info/english/> - accessed 27 March 2009).

Methodology for assessing seismic vulnerabilities of health facilities

Amod Mani Dixit* and Ramesh Guragain**

Abstract

Assessment of health facilities' structural and nonstructural components safety against possible earthquakes was developed in Nepal in 2001–2004. It is clear that not all globally developed or accepted methodologies for seismic vulnerability assessment can apply to developing countries like Nepal. Based on the experience of the National Society for Earthquake Technology (NSET) in four studies on structural and nonstructural vulnerability of hospitals in Nepal, a guideline for seismic vulnerability assessment for hospitals was published in 2004 together with WHO. The seismic vulnerability assessment tool is mainly targeted to civil engineers and technicians who are responsible for ensuring stability of the hospital building structures and their contents during earthquakes, while nonstructural guidelines can also be used by health professionals and hospital administrators. The method developed and applied also assists in prioritization. This article outlines experience in the development and application of these methods as well as the initiatives that followed after its completion and dissemination. Some of these are applications for planning purposes, i.e. for identifying the priorities of intervention in hospital systems, training needs for health professionals and initiatives by hospitals that have been through assessment and worked on expanding their preparedness with plans and drills.

Introduction

In the past, major earthquakes in Nepal have caused huge numbers of casualties and damage to structures. The Great Nepal-Bihar earthquake in 1934 reportedly killed 8519 persons and damaged 80 000 buildings in Nepalese territory^[1]. In recent years, the Kathmandu Valley Earthquake Risk Management Project (KVERMP) and other projects (e.g. The Study on Earthquake Disaster Mitigation in Kathmandu Valley) estimated high potential losses and casualties including the potential losses of medical facilities during a large earthquake affecting Kathmandu Valley^[2]. Seismic performance evaluation studies, carried out by the National Society for Earthquake Technology-Nepal (NSET) for Bir Hospital, the largest hospital of Nepal, confirmed

the prediction^[3]. Although being a seismically active country, earthquake-resistant standards have not been effectively applied and guidelines have not been published and practiced for hospital facilities in general. Most buildings in Nepal and in developing countries are non-engineered ones, and earthquake considerations have not been integrated into the buildings even in seismic regions. This is reflected also in the construction of buildings to house health facilities. For this reason, there is a higher possibility of hospital buildings not being functional during a large seismic event. This realization has led to a series of activities and programmes in Nepal directed towards improving the seismic performance of hospitals and health facilities, summarized in Box 1. Effective reduction of disaster vulnerability of health facilities can be achieved and requires a long and comprehensive logical process that should target and engage all stakeholders, and utilize the knowledge that is available in-country and globally.

*General Secretary and Executive Director,
National Society for Earthquake Technology (NSET),
Kathmandu, Nepal
E-mail: adixit@nset.org.np

**Structural Engineer, NSET, Kathmandu, Nepal

In this process, NSET conducted a project, “Structural Assessment of Hospitals and Health Institutions of Kathmandu Valley” with WHO-Nepal and the Ministry of Health, in 2001^[4]. At the initial stages of this effort, it became very clear that while the required level of knowledge existed in the country, there was an obvious lack of experience for conducting such assessments in the country as well as in the Region. The project, therefore, decided to use the experience of countries of the Pan-American Health Organization (PAHO), and utilized the services of an expert for the purpose of experience-transfer for a period of two months. The assessment estimated that most hospitals would withstand the occasional earthquake of MMI VII* without collapsing. It was found that 10% of the hospitals might be functional, 30% partially functional, and 60% out of service. The major cause of possible functional loss was considered to stem from nonstructural damage and one of the recommendations of the project was to conduct detailed nonstructural assessment of major hospitals.

As a recommended follow-up of the aforementioned study, another study called “Non-structural Vulnerability Assessment of Hospitals in Nepal” was carried out by NSET with financial support from WHO-Nepal^[5]. Both the studies were envisaged by the Health Sector Emergency Preparedness & Disaster Response Plan, Nepal, prepared by the Disaster Health Working Group (DHWG), Epidemiology and Disease Control Division (EDCD), Department of Health Services (DHS), the Ministry of Health and WHO-Nepal^[6], thus creating the background for effective national ownership of the methodologies and outcomes.

Structural vulnerability assessment:

Doing a structural assessment refers to the estimation of the performance level of the structural system when subjected to earthquake loads of different intensities.

* The Modified Mercalli Intensity scale compares earthquake effects from one location to another, or from one earthquake to another. It is based on the effects of the earthquake on buildings, objects and people.

The structural performance of hospitals in an earthquake is measured in terms of the potential damage to the structural system in relation to existing vulnerabilities. The vulnerability of the structure is its susceptibility to damage at local level as well as its consequences for the stability of the building system when subjected to earthquake load.

Nonstructural vulnerability assessment:

Assessment of nonstructural vulnerability is made in order to estimate the expected damage that these elements may suffer when subjected to earthquakes at different levels of intensity and the consequence to the functionality of the hospital. The cost of the nonstructural elements in a hospital may be much higher than that of the structure. Particularly in hospitals, it may reach up to 90% of the total facility value or even exceed it.

In summary, nonstructural vulnerability assessment and consequent implementation of mitigation measures in hospitals are justified on the following grounds:

- (1) Hospital facilities must remain as intact as possible after an earthquake due to their role in providing routine medical services as well as attending to the possible increase in demand for medical treatment following an earthquake.
- (2) In contrast to other types of buildings, hospitals accommodate a large number of patients who, due to their disabilities, are unable to evacuate a building in the event of an earthquake.
- (3) Hospitals have a complex network of electrical, mechanical and sanitary facilities as well as a significant amount of costly equipment all of which are essential both for the routine operation of the hospital and for emergency care. Failure of these installations due to a seismic event cannot be tolerated in hospitals as this could result in its functional collapse.
- (4) The ratio of the cost of nonstructural elements to the total cost of the building is much higher in hospitals than in other buildings. In fact, while nonstructural elements represent

approximately 60% of the value in housing and office buildings, in hospitals these values range from 85% to 90%, mainly due to the cost of medical equipment and specialized facilities.

Performance assessment: Based on the assessment of structural and non-structural vulnerabilities and also that of critical facilities, lifelines and in-place system of emergency response if any, the overall seismic performance of the hospital is evaluated for different levels of earthquake shaking. Priority-wise mitigation measures are then identified and recommended. The seismic vulnerability of different systems, technical and economic feasibility of implementing mitigation options, structural vulnerability and importance of the different critical systems and departments for operating the hospital after an earthquake shall

be taken as a basis for the prioritization. In addition, the priority should follow some logical sequence of improving the functional status of the hospital after an earthquake.

History

Beginning in 2000 a dedicated emergency preparedness team from the Ministry of Health, WHO and NSET in Nepal initiated a programme of assessing the seismic vulnerability of national health facilities. The starting point was a structural assessment of 14 hospitals in Kathmandu Valley, supported by PAHO carrying out the structural assessment as well as imparting the knowledge and experience to the engineers in NSET. The following box elaborates the history of health facility risk reduction in Nepal.

Box 1: Brief history of health-sector disaster risk reduction efforts in Nepal

1. **The Kathmandu Valley Earthquake Damage Scenario (1997)** revealed massive potential for casualties surpassing the combined capacities of all major hospitals in Kathmandu Valley (injuries at IX MMI > 100 000 as against available total bed capacity of 5000).
2. A workshop on **Health and Medical Implications of Earthquake Disasters** in 1998 (OFDA, WHO, MOH) provided, for the first time, access to experience (and documentation) from PAHO and SEARO. Subsequently, WHO supported several workshops, training programmes, and simulations; an EHP profile was prepared. A Disaster Health Working Group (DHWG), established after the 1993 floods in south-central Nepal was revitalized in 2000-2001.
3. **DHWG** discussed the earthquake damage scenario and prepared the National Health Sector Plan. According to the Plan structural assessment of major hospitals (structural vulnerability, qualitative + and quantitative) was conducted; technology / experience transferred from PAHO to Nepal.
4. **Structural vulnerability assessment** continued for other major hospitals. Non-structural vulnerability assessment methodology was developed and implemented in all 20 major hospitals.
5. **Patan Hospital** took the lead in implementing vulnerability reduction, revised existing plan, made mass casualty drill regular. Earthquake preparedness was institutionalized.
6. **Hospital Preparedness for Emergencies (HOPE)** course developed, implemented and institutionalized with preparation of a cadre of national/regional instructors as a part of the Programme for Enhancement of Emergency Response (PEER) supported by the US Office of Foreign Disaster Assistance (USAID/OFDA). HOPE focused on instructors' development and institutionalization of hospital preparedness in six Asian countries including Nepal. HOPE course was made multi-hazard in 2009.
7. **Emergency Plans** were developed in other hospitals and regular drills conducted an increasing number of hospitals including private ones.
8. **Structural, Nonstructural and Functional** vulnerability assessments were conducted for blood banks and Red Cross buildings.
9. **A Growing number of hospitals** implement structural and nonstructural vulnerability reduction measures. The need to support such efforts and to scale up the initiative has been included in the National Strategy for Disaster Risk Management of Nepal.

Methodology

Developing a sound methodology for seismic vulnerability assessment of hospitals in Nepal was one of the main targets of the study. This was done by adopting and adapting the provisions spelt out for such assessment in different studies^[7,8,9,10,11,12]. It was necessary to develop such a methodology because of the non-applicability of similar methodologies used in developed countries. In Nepal, there is a lack of information about the design and construction methodology which provides the input parameters required for standard methodology primarily developed for developed countries in assessment works. Also, the participation of hospital staff and possible availability of primary data have been taken into account in developing the methodology. The methodology, which was developed and used for the study is discussed below.

Structural vulnerability assessment

The description of the different steps of qualitative structural assessment methodology developed for the study is presented in the following sections.

1. Identification of Building Typology

The typology classification in this study is global, and is based on the performance of different types of buildings during past earthquakes. Building typologies defined in BCDP^[13] a Nepal National Building Code document, were taken as a basis while defining the different building typologies. The types of buildings considered are:

Type 1: Adobe, stone, adobe and stone, stone and brick-in-mud.

Type 2: Un-reinforced masonry made of brick-in-mud.

Type 3: Un-reinforced masonry made of brick-in-lime, brick-in-cement, and well-built brick in mud, stone in cement (well-built brick in mud: with wooden bands, corner posts with

very good wall/area ratio and proper connection; original courtyard type).

Type 4: Reinforced concrete ordinary-moment-resistant-frames (OMRF)

A: OMRF with more than three stories

B: OMRF less or equal to three stories

Type 5: Reinforced concrete intermediate-moment-resistant-frames (IMRF)

Type 6: Reinforced concrete special-moment-resistant-frames (SMRF)

Type 7: Other (must be specified and described)

2. Selection of appropriate fragility function

The performance level of specific building types as described above was decided based on the internationally available descriptions of seismic performance during past earthquakes. The description of both structural and nonstructural damage was taken as the basis for performance evaluation. However, such descriptions are not available for all building types found in Nepal, and a combination of international and Nepalese standards were therefore used to define fragility function. For this evaluation, the damage extent at different intensities was taken from fragility functions derived in BCDP^[13] and European Macro-seismic Scale, 1998.

3. Vulnerability factors identification

The appropriate vulnerability factors for different types of buildings were selected using the set of appropriate checklists available in Federal Emergency Management Agency (FEMA)^[12]. The basic vulnerability factors related to building systems, lateral force resisting systems, connections, diaphragms, geologic and site hazard, and nonstructural hazards were evaluated based on visual observation of buildings and sites. Critical vulnerability factors that were necessary to check with quick calculations were identified in this step.

Table 1: Checklist for identifying probable influence of different vulnerability factors on the seismic performance of buildings

Vulnerability factors		Vulnerability of the building by different vulnerability factors				
		High	Medium	Low	N/A	Not known
Building System	Load path					
	Weak storey					
	Soft storey					
	Geometry					
	Vertical discontinuity					
	Mass					
	Torsion					
	Deterioration of material					
	Cracks in infill wall					
	Cracks in boundary columns					
Lateral Force Resisting System	Redundancy					
	Shear stress criteria					
Connection	Connectivity between different structural elements					
Others	Pounding effect					

Some specific vulnerability factors like integrity of different structural components, bonding between two widths of stone masonry wall, flexible roofing and flooring system, interaction of structural/nonstructural components were also checked in this step. In addition, provision of seismic detailing was also checked wherever detailed construction drawings were available.

4. Checking of stress conditions of some components by mathematical calculations

The severity of different vulnerability factors was checked by quick calculations wherever necessary. These calculations were quick shear checks, strong-column, weak-beam condition, short column effect, soft-story effect etc. Those checks sometimes revealed the critical status of the building.

5. Identifying probable influence of the different vulnerability factors on the seismic performance of buildings

Based on the observations and quick checks, probable effects of different vulnerability factors

on the targeted building were assessed in this step. Increase in vulnerability by all these vulnerability factors was assigned as high, medium, low, not applicable and unknown to the building. Table 1 provides a checklist of the vulnerability factors and their effects on the building.

6. Interpretation of the building's fragility based on the surveyed vulnerability factors

The probable damage to a building was judged using the general fragility curve chosen for the building combined with the assessed influence of different vulnerability factors. Based on this, the targeted building was classified as "average", "good" or "weak" for that particular typology. The classification "good" means that the building is better than average buildings of that type whereas a "weak" building is worse than an average building of that type.

Table 2: Format for structural safety of the building at different intensities of earthquakes

	Performance of the building			
	MMI VI	MMI VII	MMI VIII	MMI IX
Building # 1				

7. Making structural safety statement about the building

The expected structural performance of hospital buildings during different levels of shaking measured on the MMI scale was figured out based on the interpretation of building fragility. Table 2 shows the format for making the safety statement about the building. There are five grades of damage from grade 1 to 5 as defined in BCDP^[13].

Nonstructural vulnerability assessment

The major steps carried out for the nonstructural assessment of hospitals are discussed below.

1. Identifying critical systems and facilities

Identification of critical systems and essential functions of hospitals was carried out based upon the functional requirements of the hospital during and after an earthquake. The main critical systems and facilities, for continued functionality of the hospital after an earthquake were identified. Following steps were followed to identify the critical systems.

The steps for identifying the critical systems and facilities were as follows:

Step 1: Visit the hospital and explain the scope of work to the hospital administration

Step 2: Collect information on buildings, lifeline systems and facilities

Step 3: Visit essential and critical facilities

Step 4: Visit lifeline facilities

Step 5: check correlation between the structural system, medical facilities and lifeline systems.

2. Assessment of individual components

All the identified critical systems and facilities were visited to evaluate the vulnerability of the

individual components. All equipment and components were rated against two earthquakes, i.e. a medium-size earthquake (MMI VI-VII) and a severe earthquake (MMI VIII-IX)*, in terms of different levels of damage. Four levels of damage – very high, high, medium and low were taken in this case. Vulnerability reduction options, implementation priority and cost estimation for implementation of mitigation options were identified for all equipment.

3. Assessment of systems' vulnerability

Based on the assessment of the individual components of the respective systems, the critical systems and medical facilities were examined to find out the possible level of damage in the two earthquake scenarios. Mitigation options for each system were identified and critically evaluated in terms of ease and cost of implementation and their expected efficiency in relation to vulnerability reduction.

The feasibility of implementing mitigation options are defined as either easy-to-implement or difficult-to-implement. Easy-to-implement means the maintenance division of the hospital can implement the mitigation options after a short training from experts and the materials necessary for implementing mitigation options are available locally. While difficult-to-implement means external experts are necessary to implement the mitigation options and the necessary materials are not available locally.

* A level VIII on the Mercalli scale puts damage as slight in specially-designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures.

An intensity of IX describes considerable damage in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations.

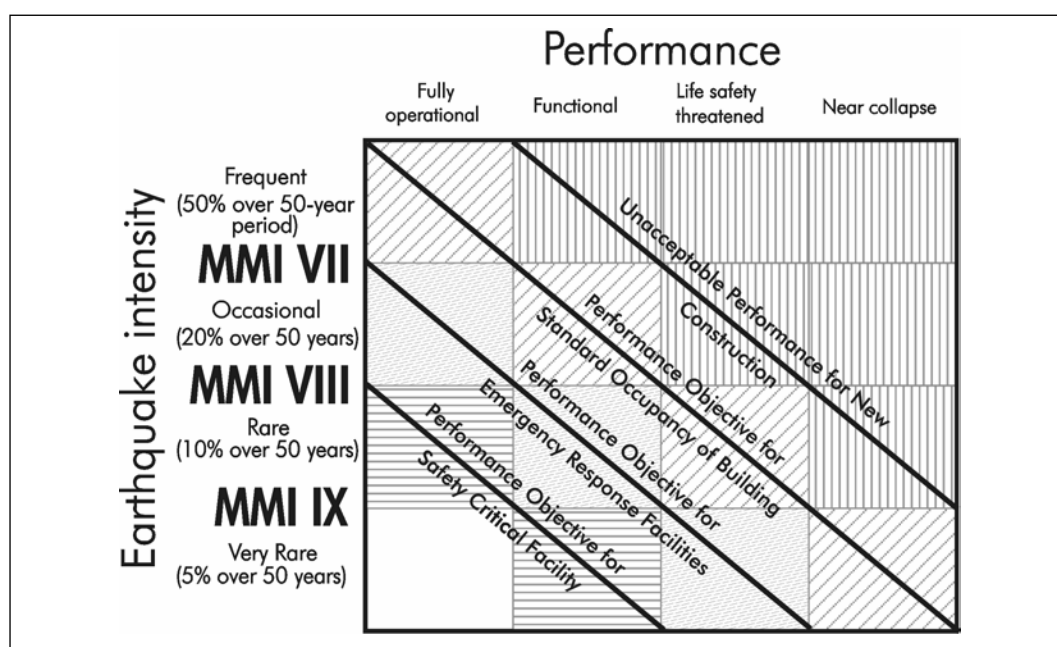
The terms used to define the cost for implementing the mitigation options to reduce the risk are described as low and high cost. These are basically relative terms. Low-cost-involvement means the cost involvement is less than 100 000 Nepali rupees (NRs.) or the hospital administration/maintenance division can allocate the budget to implement the mitigation option. High-cost-involvement means the cost involvement is more than NRs. 100 000 or the hospital administration/maintenance division cannot allocate the budget to implement the mitigation option and needs external financial support.

Performance assessment of hospital

Based upon the structural and nonstructural vulnerability assessment of the hospital buildings and different critical systems and facilities, the functional assessment of the hospitals was made for two earthquake scenarios.

The hospital was then compared with the following risk acceptance matrix, proposed by Structural Engineers Association of California (SEAOC)^[14]. Each assessed hospital was plotted in this matrix to compare the existing safety level to the standard expected safety level. The Figure shows the risk acceptance matrix used for the study.

Figure: Risk acceptance matrix used for the study



Identification of vulnerability reduction measures

Considering the opportunity for immediate implementation of nonstructural risk mitigation measures, some examples of mitigation options to solve the problems were developed. The purpose was to guide the hospital maintenance division to start implementation. Some representative problems from different hospitals

were taken and solutions were provided using illustrative graphics. The following is one of the examples prepared during the study.

Improving safety of operating theatres

Almost all equipment in the operation theatres in Nepalese hospitals was on rollers or roller trolleys and therefore highly vulnerable.

However, for everyday use this equipment must be flexible and mobile and cannot be permanently fixed. Thus, a special system for anchoring the equipment is necessary; anchoring which can fix the equipment during operations and can be removed afterwards. The system can be a steel frame consisting of vertical and horizontal angles attached to the equipment rack. The system should have a number of chains, straps, hooks and guide bars in the rack for fixing and securely placing the equipment in the rack. The frame can then be fastened in a location near the operation table during the operation. By providing anchor bolts on the ceiling and on the floor the equipment rack can be positioned near the OT table. Similarly, anchor bolts should be provided in the walls in appropriate locations so that the equipment can be removed and fixed in a safe place when not used.

Key findings and recommendations

By assessing the structural and nonstructural components against possible earthquakes, the expected performance of hospitals were evaluated and compared with standard risk acceptance matrices. The results show that about 80% of the hospitals assessed in the study fall in the unacceptable performance level for new construction. The remaining 20% are at the level of risk to life safety or near collapse. Recommendations were made to improve the seismic performance of different hospitals on priority basis. Fixing of all equipment and contents, strengthening of critical systems, training hospital personnel and provision of some redundancies in critical systems were the proposed activities in the first phase. Seismic retrofitting of hospital buildings, further strengthening of critical systems and provision of extra redundancies in the systems were the activities proposed in the second phase of implementation. Considering the opportunity for immediate implementation for nonstructural risk mitigation, some examples of mitigation options to solve the problems were developed during the study.

The results of the study show an alarming situation where immediate reconstruction of most of the hospital buildings to achieve the standard acceptable level of safety is necessary. However, the study recommended the approach of gradually increasing safety considering the socio-economic condition of the country and the fact that medium-level earthquakes are more frequent than severe ones. Thus, priority-wise recommendations have been made to improve the seismic performance of each hospital. The seismic vulnerability of different systems, technical and economic feasibility of implementing mitigation options, structural vulnerability and importance of the different critical systems and departments in order to operate the hospital after an earthquake have been taken as a basis for the prioritization of recommended actions. Moreover, the possibilities of implementing different mitigation options were also discussed with the respective hospital administration staff before finalizing the priority. The technical feasibility of implementing mitigation options were discussed in a workshop attended by engineering professionals. Table 3 shows the phase-wise recommendations made by the study.

The expected seismic performance of the hospitals after implementation of Phase I and Phase II recommendations were again compared with the above-mentioned risk acceptance matrix to determine the expected improved situation after implementation of Phase I and Phase II recommendations. After the implementation of Phase I recommendations (at an estimated cost of \$US 150 000), 90% of facilities would meet the performance objectives for standard occupancy of buildings defined in the matrix (refer to Figure 1, p. 28), while 10% would reach the level for emergency response facilities. The implementation of Phase II recommendations (at an estimated cost of \$US 5 200 000) would mean that 90% of facilities would meet the performance objectives for emergency response facilities, while 10% would reach the highest level, that of the performance objectives for safety critical facilities.

Table 3: Recommendations of the study

Phase and objective	Activities	Cost estimate
Phase I: To expect the hospitals to be fully operational after a moderate earthquake	• Fixing of all equipment and contents • Strengthening of critical systems • Training hospital personnel • Provision of some redundancies in critical systems	US\$ 150 000 for Phase I recommendations in the nine assessed hospitals
Phase II: Additional recommendations for improving the performance of the hospital to a desirable level after a severe earthquake	• Seismic retrofitting of hospital buildings • Further strengthening of critical systems • Provision of extra redundancies in the systems	US\$ 5 200 000 to implement structural and nonstructural mitigation options in the nine assessed hospitals

Conclusions

The available methodologies for assessment as well as mitigation options of hospitals in Nepal are not suitable to the local environment largely because of the difference in the typologies of the construction resulting from the preference of certain construction

materials by the community. Appropriate methodologies were developed and tested to ensure that the local problems could be addressed properly. The development of practical methods applicable to the local situation helped in the consensus-building among government authorities and hospital professionals.

References

- (1) Rana BSJB. 1934 Great Earthquake of Nepal (In Nepali. Kathmandu, 1935.
- (2) Ministry of Home Affairs, Nepal. The Study on Earthquake Disaster Mitigation in the Kathmandu Valley Kingdom of Nepal. Kathmandu: JICA, 2002.
- (3) Patton R, Thomas B, Basnet R, Guragain R. A Report on Emergency Preparedness and Seismic Vulnerability of Bir Hospital. Kathmandu: National Society for Earthquake Technology-Nepal (NSET), 2000.
- (4) Ministry of Health, Nepal. A structural vulnerability assessment of hospitals in Kathmandu valley. Kathmandu: Department of Health Services, 2002. (http://www.searo.who.int/LinkFiles/Nepal_-_EPR_Publications_assessment-hospital.pdf - accessed 26 March 2009).
- (5) Ministry of Health and Population, Nepal. Non-structural vulnerability assessment of hospitals in Nepal. Kathmandu: MOHP, 2003.
- (6) Disaster Health Working Group (DHWG), Nepal. Emergency Preparedness & Disaster Response Plan Part:1. Kathmandu, 2001.
- (7) Johnson GS, Sheppard RE, Quilici MD, Eder SJ, Scawthorn CR. Seismic Reliability Assessment of Critical Facilities: A Handbook, Supporting Documentation and Modal Code Provisions, Technical report MCEER-99-0008, 1999.
- (8) World Health Organization, Regional Office for the Western Pacific. Field manual for capacity assessment of health facilities in responding to emergencies. Manila, 1999 (http://www.wpro.who.int/publications/PUB_9290612169.htm - accessed 27 March 2009).
- (9) New Zealand Standard (NZS). Seismic Restraint of Building Contents. NZS 4104:1994 (Scope Only). Wellington: Standard Council, 1994. (<http://shop.standards.co.nz/scope/NZS4104-1994.scope.scope.pdf> - accessed 27 March 2009).

- (10) New Zealand Standard (NZS). Specification for Seismic Resistance of Engineering Systems in Building. NZS 4219:1983. Wellington: Standard Council, 1994.
- (11) Federal Emergency Management Agency (FEMA). NEHRP Guidelines for the Seismic Rehabilitation of Buildings. FEMA-273/October 1997. Washington D.C: Building SEISMIC Safety Council, 1997.
- (12) Federal Emergency Management Agency (FEMA). Handbook for Seismic Evaluation of Buildings - A Prestandard, FEMA-310, 1998.
- (13) Building Code Development Project (BCDP). The Development of Alternative Building Materials and Technologies for Nepal. Appendix C: Seismic Vulnerability Analysis, 1994.
- (14) Structural Engineers Association of California (SEAOC). Vision 2000 - A Framework for Performance Based Design. 1995.
- (15) Federal Emergency Management Agency (FEMA). Prestandard and Commentary for the Seismic Rehabilitation of Buildings, FEMA-356, 2000.



Emergency preparedness of the health workforce for primary health care facilities

Khem B. Karki*

Abstract

A health-care facility without a trained and competent health workforce cannot save lives of the victims. Therefore, for immediate response after a disaster or any serious epidemic outbreak, a health-care facility in the vicinity with trained health personnel is a basic requirement.

One of the major components of the theme for this year's World Health Day "Health Facilities in Emergencies" is improving the preparedness and risk-reduction capacity of health workers.

Health workers should possess two types of capacities: general capacities such as for rapid health assessment; emergency relief; mass casualty management; curative care; and public health, and specific capacities such as for emergency surgical skills and advance life support, etc.

Disaster management is not only a health sector responsibility, but is also a multisectoral one at different levels. Intra-health agency coordination is also vital to scale up the rapid response. Preparedness of the health workforce is part of the emergency preparedness and disaster response plan. The health workforce in primary health care (PHC) facilities should be trained and frequently updated and refreshed.

A district-level rapid response team should be formed comprising a district health officer, medical officer, public health officer, health assistants, senior auxiliary health workers, public health nurses, auxiliary nurses and midwives (ANMs), community medical assistants, vector control assistant, malaria inspector, immunization supervisors, laboratory technician, health educators and a statistical assistant. Similarly, the health workforce in hospitals should also be prepared to tackle any emergencies. The disaster management section at national, provincial and district levels should also maintain a roster of trained health workforce so that health workers can be mobilized at short notice following an emergency.

Keywords: Health workforce, emergency preparedness, disaster, emergency, capacity of the health workforce.

Following a disaster or an emergency, victims visit health-care facilities in their vicinity so as to preserve their lives; prevent further injuries or illness and promote their recovery. If PHC facilities are not accessible and functional, the death toll of victims will certainly increase. A health-care facility without a trained and competent health workforce cannot save the

lives of victims. Therefore, for immediate response following a disaster or any serious epidemic outbreak, a health facility in the vicinity with trained health personnel is a basic requirement.

Disaster is a serious disruption of the functioning of a society, causing widespread human, material or environmental losses, including loss of lives and deterioration of health and health services. This disruption is

*Executive Director, Society for Local Integrated Development (SOLID), Kathmandu, Nepal

on a scale sufficient to warrant an extraordinary response from outside the affected community or area. **Emergency** is an extraordinary situation where there are serious and immediate threats to human life as a result of disasters, imminent threats of disasters or cumulative processes of neglect, civil conflict, environmental degradation and extremely negative socioeconomic conditions⁽¹⁾. The aim of working in emergencies is primarily to save human lives. The health workforce, thus, forms a vital part of dealing with any kind of emergencies.

One of the major objectives covered by the theme for this year's World Health Day: "Health Facilities in Emergencies" is to improve the preparedness and risk-reduction capacity of health workers.

Health workers are "all people engaged in actions, the primary intent of which is to enhance health"⁽²⁾. There are two categories of health workers in health facilities — professional workers such as doctors, nurses, midwives and paramedics, and associate workers such as medical recorders, administrators, clerks, secretaries, painters, cleaners and drivers, etc. Both of these categories of workers should be prepared for quick and effective response.

During a disaster, community people are the first to respond but they may not have adequate resources and the technical knowhow to tackle emergencies. Qualified, experienced and well-prepared health personnel are usually needed in such cases to help treat the casualties. But, authorities in many countries in the world rarely consider an early investment in national staff to prepare for emergency response as a necessary component⁽³⁾.

South-East Asia has long experienced many disasters. Hundreds of thousands of lives have been claimed by disasters, property worth millions has been destroyed and many development infrastructures damaged. The

disasters we commonly face are earthquakes, floods, landslides, fires, epidemic outbreaks, explosions and traffic accidents. We also face cyclones, tsunamis and glacier lakes outburst floods (GLOFs). The GLOFs and avalanches are typical of the high Himalayan regions. The GLOFs result from outbursts of glacier lakes due to destruction of the natural dams that contain the lakewater. Most of these lakes are dammed either by ice-core moraine or by moraine debris. The damage occurs either due to the destruction of the moraine dam by backwater erosion or due to melting of the ice core of the damming moraine. The problem of GLOFs is getting exacerbated due to climate change resulting in accelerated melting of glacier tongues and rapid enlargement of glacial lakes that are contained by natural moraine dams. Several dangerous lakes have been mapped in the Himalayas of Nepal⁽⁴⁾. So far, an early warning system has been established in only some GLOF-affected areas. Such a system comprises alarm bells that connect the glacier lake to riversides in such a manner that when the lake bursts, bells ring and people move to safe places. No specific plans and programmes have been put in place to prevent GLOFs and thereby protect numerous human settlements that come up on the riverside because of its fertile land. A comprehensive plan to minimize the GLOF disaster should therefore be developed and implemented.

In the case of some disasters, such as the tsunami of 2004 and the earthquake in Gujarat, India in 2001, hundreds of health facilities are destroyed. Last year, in August 2008, Nepal had to face the Koshi river floods that affected around 40 000 people⁽⁵⁾.

South-East Asia is also vulnerable to epidemic outbreaks. The region had to face the SARS epidemic in 2003, as well as avian influenza. It also faces a big threat of avian influenza outbreak any time. Recently, outbreaks of H5N1 influenza virus were reported in poultry on the Indo-Nepal border.

Nepal, for the first time, reported two outbreaks of H5N1 in January and February 2009⁽⁶⁾.

Looking at these facts and figures, we can clearly say that, at any time in future, we can face emergencies. Therefore, we should always be ready to tackle those emergencies by preparing a trained and proactive frontline health workforce that includes public health professionals, medical care professionals, “first responders” and obviously, volunteers.

Preparedness plans should be in place to update and scale up the capacity of the health workforce to both respond as well as reduce the risk of emergencies. The loss of lives, illness and diseases caused by outbreaks and other natural disasters can all be reduced if preparedness plans are in place, and are easily and quickly activated. Emergency preparedness requires the availability of an up-to-date database of the actual competencies of health personnel, knowledge about how to communicate risk effectively, and a way of prioritizing training needs, policies and actions to ensure the safety of health personnel.

The major aim of the preparedness plan is to train appropriate health staff to carry out rapid diagnosis, surveillance, organization and logistics, containment, communication and emergency surgery. The skills and knowledge required for responding to disasters and outbreaks vary according to the nature of the emergency. Natural calamities such as earthquakes, cyclones, floods, landslides, heavy rains, explosions, and traffic accidents may primarily demand emergency surgical skills where as droughts, famines and epidemics may require more of medical skills.

The health workforce should be prepared for an immediate response to emergencies and disasters. Considering our experiences in Nepal, the health workforce should have a thorough update on the following contents of Box 1:

Box 1: Contents for a Disaster Preparedness and Response Plan¹

- Concept and terminologies in disaster management
- Disaster management cycle
- Potential hazards/disasters in local area
- Disaster risk-reduction initiatives and key players
 - National policies
 - Health sector
- Disaster risk reduction
 - Hyogo Framework of Action
- Lessons learnt from a recent response to a disaster
- Community-based disaster management experience/lesson
- Hospital disaster preparedness and response
- Myths and realities regarding emergencies and natural calamities
- Epidemic preparedness and response - diseases with the potential to cause an epidemic
- Mass casualty management – hospital- and field-based
- Mass casualty management – triage and volunteer preparation
- Mass casualty management - mock drill
- Practical exercise – mock drill in a hospital
- Mass casualty management – preparation for a mock drill
- Debriefing of the drill – summarize
- Concept and role – Rapid Response Team
 - District, region and central
- Hospital disaster preparedness and response
- Concept and templates to use for planning
- Disaster preparedness and response plan
 - Coordinated framework for a district
- Preparedness and response planning

¹ cited from the Training Report on Emergency Preparedness and Disaster Response including Mass Casualty Management Mock Drill, Organized by Merlin, Nepal, February 2008.

In the present times, we not only face natural disasters but also armed conflicts. During and after conflicts, as also in post-disaster situations, there are chances of sexual and gender-based (GBV) violence occurring on a huge scale. For example, sexual violence during an armed conflict is being used as a weapon of war to brutalize and instil fear in the civilian population, especially women and girls. Similarly, following a disaster, the chances of sexual abuse and crimes are high. We have many examples of sexual abuse and crimes faced by displaced people. Therefore, the Inter-Agency Standing Committee (IASC)² issued Guidelines for Gender-based Violence Interventions in Humanitarian Emergencies: Focusing on Prevention and Response to Sexual Violence in 2005.

In this context therefore the health workforce, especially workers engaged in PHC settings should be trained according to the guidelines that provide practical advice on how to ensure that humanitarian protection and assistance programmes for displaced populations are safe, and that they do not directly or indirectly increase women's and girls' risk to sexual violence.

The IASC guidelines denote the minimum standard of emergency preparedness measures to be carried out immediately following an emergency, as described in Box 2 (page 26).

The capacity building package for public health workforce should be standardized by incorporating in it the issues regarding prevention of sexual and gender-based violence, and improving sexual and reproductive health and rights.

Disaster management is not only a health sector responsibility, but is also a multisectoral one at different levels. There are many agencies working even in the health sector. Intra-health

agency coordination is therefore vital to scale up the rapid response related to emergencies.

We should always keep in mind that preparedness of the health workforce is part of the emergency preparedness and disaster response plan. Within the framework of the total emergency plan, the preparedness of health workers and enhancement of their risk-reduction capacity are crucial, and have to be extended to the community level. Equal importance, as in hospital preparedness, has to be given to preparedness in PHC settings and facilities comprising district hospitals, PHC centres and basic health care units such as health posts and subhealth posts in communities. The health workforce in PHC facilities generally comprises nurses, midwives and paramedics. This category of the health workforce is the first "responder" to casualties or victims. Therefore, personnel of this category should be trained properly.

In the context of Nepal, the Department of Epidemiology and Disease Control, Ministry of Health, has trained and developed a rapid response team (RRT) in all districts. A district-level RRT is composed of a district health officer, medical officer, public health officer, health assistants, senior auxiliary health workers, public health nurses, ANMs, community medical assistants, vector control assistant, malaria inspector, immunization supervisors, laboratory technician, health educators and a statistical assistant. These are health workers engaged basically in PHC settings, and they are trained for early warning and rapid response. They conduct a rapid health assessment using the standard guidelines and send their report to the centre concerned not later than 24 hours after a public health emergency. At the same time, they start the rescue and response procedure. The government has prepared and trained RRTs at district, regional and national levels.

In Nepal, different organizations have trained their respective health workforces. According to recorded data, up to 2007, 1070 health workers had been trained. (see figure on page 27). The Department of Epidemiology and Disease Control has an ongoing capacity-building process in place for the health workforce.

² IASC comprises the Food and Agriculture Organization of the United Nations (FAO), Office for the Coordination of Humanitarian Affairs (OCHA), United Nations Children's Fund (UNICEF), United Nations Development Programme (UNDP), United Nations Population Fund (UNFPA), United Nations High Commissioner for Refugees (UNHCR), World Food Programme (WFP) and World Health Organization (WHO).

Box 2: Emergency preparedness interventions in post-conflict or post-disaster humanitarian settings³

Coordination

- Determine the coordination mechanisms and responsibilities
- Identify and list the partners and GBV focal points
- Promote human rights and best practices as central components of preparedness planning and project development
- Advocate for GBV prevention and response at all stages of humanitarian action
- Integrate GBV programming into preparedness and contingency plans
- Coordinate GBV training
- Include GBV activities in inter-agency strategies and appeals
- Identify and mobilize resources

Assessment and monitoring

- Review the existing data on nature, scope and magnitude of GBV
- Conduct capacity and situation analyses and identify good practices
- Develop strategies, indicators and tools for monitoring and evaluation

Protection (legal, social and physical)

- Review national laws, policies and enforcement realities with regard to protection from GBV
- Identify priorities and develop strategies for security and prevention of violence
- Encourage ratification, full compliance and effective implementation of international instruments
- Promote human rights, international humanitarian law and good practices
- Develop mechanisms to monitor, report and seek redress for GBV and other human rights violations
- Train all staff on international standards

Human resources

- Ensure that the Secretary-General's Bulletin is distributed to all staff and partners, and that they are trained accordingly
- Train staff on gender equality issues, GBV and guiding principles, and international legal standards
- Develop a complaints mechanism and investigations strategy
- Minimize the risk of sexual exploitation and abuse (SEA) of the beneficiary community by humanitarian workers and peacekeepers

Water and sanitation

- Train staff on the design of water supply and sanitation facilities

Food security and nutrition

- Train staff and community food management committees on the design of food distribution procedures
- Conduct contingency planning
- Arrange for supplies

Planning for shelters and sites, and for distributing non-food items

- Train staff and community groups on shelter/site planning, and distribution procedures for non-food items
- Ensure safety of planned sites and of sensitive locations within sites
- Plan provision of shelter facilities for survivors/victims of GBV

Health and community services

- Map the current services and practices
- Adapt/develop/disseminate policies and protocols
- Plan and stock medical and RH supplies
- Train staff on GBV health care, counselling, referral mechanisms and rights issues
- Include GBV programmes in health and community service contingency planning

Education

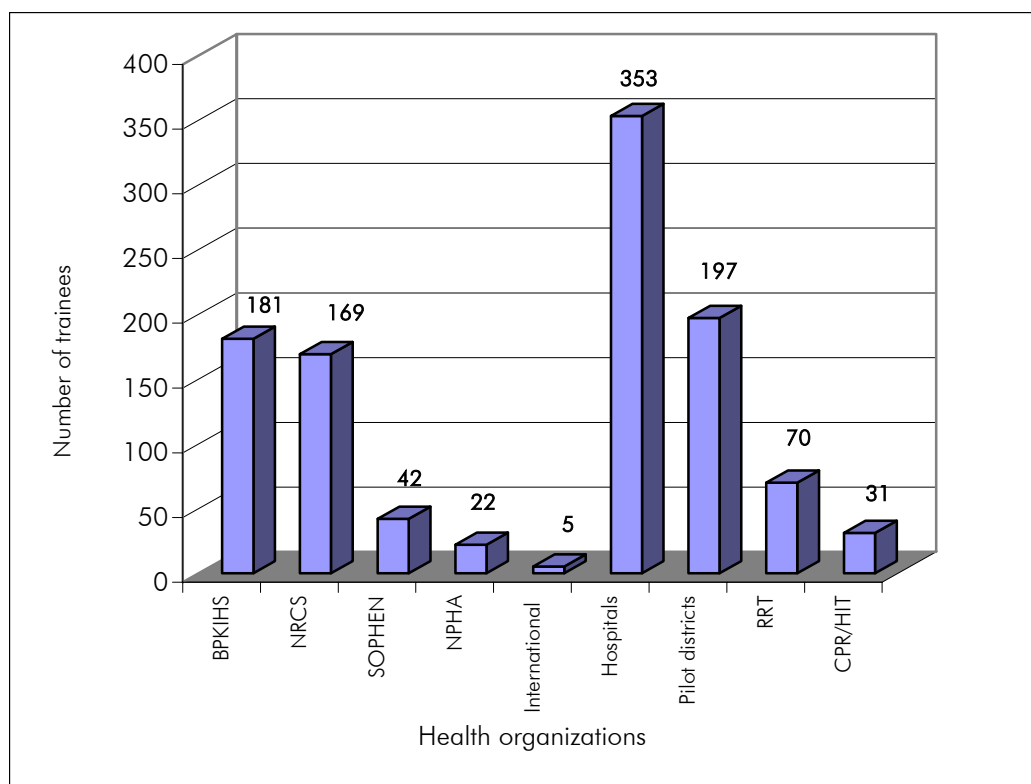
- Determine education options for boys and girls
- Identify and train teachers on GBV

Information, education and communication (IEC)

- Involve women, youth and men in developing culturally appropriate messages in local languages
- Ensure the use of appropriate means of communications for awareness campaigns

³ cited from Guidelines for Gender-based Violence Interventions in Humanitarian Settings, 2005

Figure: Capacity building of the health workforce – Emergency and Humanitarian Action (EHA) trainees trained by different health organizations



BPKIHS–B.P. Koirala Institute of Health Sciences; NRCS–Nepal Red Cross Society; SOPHEN–Society of Public Health Engineers, Nepal; NPHA–Nepal Public Health Association; RRT–Rapid Response Team; CPR/HIT–Cardiopulmonary Resuscitation/Health in Transition

Source: EHA Unit, WHO/SEARO

The RRT members should always be alert and ready to respond to emergencies. Their objectives are: to carry out surveillance and information management; early identification of emergencies; epidemic preparedness; prompt response to prevention and control of emergencies; and responding to post-disaster health events. The Department of Epidemiology and Disease Control provides outbreak and emergency management training to RRT members.

However, RRTs are not adequately functional in all districts as all their members are not properly trained. The health

workforce should therefore be trained and frequently updated and refreshed. If the training provided to the health workforce is not sufficient, its members should be put in regular touch with the disaster management section. On its part, the disaster management section should maintain a roster of the trained health workforce so that its members can be mobilized at short notice following an emergency.

Similarly, the Department of Epidemiology and Disease Control has trained the health workforce in hospitals. Also, hospitals have now started preparing their emergency

plans⁽⁷⁾. The Department of Emergency in central, regional and zonal hospitals is now well versed in mass casualty management. These departments keep their staff refreshed and updated regularly by carrying out mock drills. A mock drill is a simulated practical demonstration of mass casualty and hospital response. Mass casualty management is management of a mass casualty event, aimed at minimizing the loss of life and disabilities. The mass casualty management system is based on pre-established procedures, and is used in emergency activities. It can also be adapted to meet the demands of major incidents. It maximises the use of existing resources, as well as multi-sectoral preparation and response⁽⁸⁾. Therefore, the health workforce, particularly working in emergency departments, should be professionally updated regularly on mass casualty management.

At times, the public health workforce cannot be mobilized properly, as for example, during the initial phase of the H5N1 outbreak in Nepal. As a result, health workers could not check the health condition of the culling team regularly during the culling of poultry products during this phase. However, during the second outbreak, health workers were mobilized properly. This shows that health workers should be properly prepared to face health challenges. Furthermore, there should be proper communication between animal health and human health departments, both of which should share their plans and policies related to AI at the district level. There should be regular and close contact between health workers and the disaster management section. Also, health workers should have a positive attitude, along with a sense of responsibility.

Manuals, guidelines and standard operating procedures for preparedness and

management of emergencies should be prepared and distributed to generate intra- and inter-departmental coordination and networking. Regular follow-ups and refresher courses among key stakeholders should also be part of emergency preparedness. In this respect, the follow-up and monitoring systems in Nepal are inadequate.

Another important factor to be considered for preparedness of the health workforce is to strengthen the pre-service training curriculum. Most pre-service courses cover disaster and emergency management but generally this topic is given less priority. Therefore, urgent efforts are needed for public health schools and colleges to scale up their skills and knowledge on disaster and emergency management. Regular advocacy, lobbying and follow-up with schools and colleges should be carried out. At the same time, the capacity of teachers should also be scaled up, and their knowledge updated.

Conclusion

Capacity building of the health workforce is a fundamental element of a standard emergency preparedness package. It is obvious that without trained and committed health workers, the purpose of emergency preparedness cannot be fulfilled. Training courses for health workers should be very comprehensive so that they can manage the whole spectrum of health-related issues during an emergency or conflict, including sexual and reproductive health, particularly sexual and gender-based violence. Regular follow-up and refresher courses on different issues of disaster/ emergency management should be part of national health systems. Furthermore, pre-service courses should be harmonized with the requirements of national health systems. We, the health-care workers, should not forget that emergency response is part of our daily work.

References

- (1) Ministry of Health, Nepal. *Health sector emergency preparedness and disaster response plan Nepal*. Kathmandu: MOH, Department of Health Services, Epidemiology and Diseases Control Division, 2003. (http://www.searo.who.int/LinkFiles/Nepal_-_EPR_Publications_HS-EPR-Nep.pdf - accessed 23 March 2009).
- (2) World Health Organization. *Working together for health: the World health report 2006: policy briefs*. Geneva: WHO, 2006. (http://www.who.int/whr/2006/whr06_en.pdf - accessed 23 March 2009).
- (3) World Health Organization. Mobilising for emergency need: natural disasters and outbreaks. In: *Working together for health : the World health report 2006 : policy briefs*. Geneva: WHO, 2006. p. 29. (http://www.who.int/whr/2006/whr06_en.pdf - accessed 23 March 2009).
- (4) *National strategy for disaster risk management in Nepal (NSDRI)*. Kathmandu: National Society for Earthquake Technology (NSET) – Nepal, 2008. (<http://www.undp.org.np/pdf/NSDRMFinalDraft.pdf> - accessed 23 March 2009).
- (5) *Nepal floods, Koshi river, Saptari* OCHA/UNDAC field situation report no. 15. OCHA/UNDAC, 2008. ([http://www.reliefweb.int/rw/RWFiles2008.nsf/FilesByRWDocUnidFilename/FBUO-7JHDL5-full_report.pdf/\\$File/full_report.pdf](http://www.reliefweb.int/rw/RWFiles2008.nsf/FilesByRWDocUnidFilename/FBUO-7JHDL5-full_report.pdf/$File/full_report.pdf) - accessed 23 March 2009).
- (6) World Health Organization. *H5N1 avian influenza: timeline of major events*. Geneva: WHO, 2009. (http://www.who.int/csr/disease/avian_influenza/Timeline_09_02_23.pdf - accessed 23 March 2009).
- (7) Ministry of Health, Nepal. *Manual for management and control of epidemic*. Kathmandu: MOH, Department of Epidemiology and Disease Control, 2008.
- (8) Pan American Health Organization. *Establishing a mass casualty management system*. Washington D.C: PAHO, 1995.
- (9) Inter-Agency Standing Committee. *Guidelines for gender-based violence interventions in humanitarian settings: focusing on prevention and response to sexual violence emergencies*. IASC, 2005. (<http://www.reliefweb.int/library/documents/2005/iasc-gen-30sep.pdf> - accessed 23 March 2009).



Disaster risk reduction through strengthened primary health care

Roderico H. Ofrin* and Ilsa Nelwan**

Abstract

Crises that affect communities have become more pronounced in recent years for various reasons. Challenges, old and new, such as unaddressed poverty, shifts in populations and changes in behaviours put forth by drivers such as globalization of economies and health services/products, climate change and information technology, confront the concept of primary health care (PHC) as a level of delivery of services and as an approach¹. It is known that the first responders to needs in any crisis are people in the affected community, and regarding health, a large part of those needs relate to health services at the primary level. The paper dissects the impact of disasters and crises on health systems and discusses whether investments in PHC contribute to disaster risk reduction. It also presents a few examples to show that PHC facilities, staff and services that are improved and provided for prior to disasters, provide effective response and support recovery interventions much faster.

Introduction

The call for revitalizing PHC comes at a time when the world is in a state of flux. More issues than usual have arisen with regard to the health needs of populations. Global challenges are being experienced and felt in communities, rural or urban, and in various settings. Aside from the rapid epidemiological shifts of health problems and the continuing inequities in the access, affordability and quality of basic health services, we see that an imbalance remains. This background of inequity in the context of crises creates further stress on communities and systems, making it more difficult for them to cope and recover. As such, the paper will discuss how strengthening PHC can also reduce the risks to the health of populations before, during and after disasters.

As mentioned, it would be important to look at pre-disaster characteristics of communities and their health. Recently, an inequity analysis was conducted in Bangladesh, India, Indonesia, Maldives, Nepal, Sri Lanka and Thailand in the WHO South-East Asia (SEA) Region, covering several indicators^[1].

This paper will take only one example of a PHC element: maternal health; this is illustrated below:

Having a skilled birth attendant during the birth of a child improves the likelihood of a safe delivery. A skilled birth attendant is a medical doctor, midwife, nurse or any other category of the health workforce who has been given appropriate training to care for mothers giving birth. The global experience and scientific evidence make it very clear that childbirth with a skilled attendant and access to emergency obstetric care at adequately equipped health facilities are essential and critical to substantially reducing maternal mortality, which is one of the key health Millennium Development Goals (MDGs).

* Regional Adviser for Emergency and Humanitarian Action, WHO Regional Office for South-East Asia

** Regional Adviser for Health Systems, WHO Regional Office for South-East Asia

¹For the purpose of this paper, PHC will not be divided into these two concepts

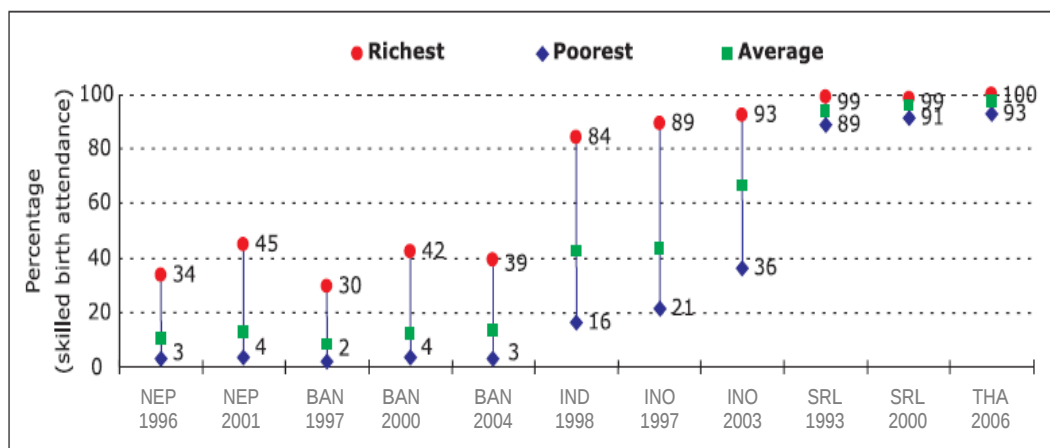
Unfortunately, skilled attendance at childbirth is relatively uncommon in most countries of the SEA Region, except Sri Lanka, Maldives and Thailand, where skilled birth attendance is almost universal. Almost all babies in Sri Lanka (96%), Maldives (85%) and Thailand (97%) are born with a skilled birth attendant present. In these countries, the coverage rates of skilled birth attendance are high regardless of the socioeconomic, educational and geographical differences among different population groups.

The low accessibility to skilled birth attendance and well-equipped health facilities is partly due to the fact that a large percentage of the population in other countries live in rural areas where access to

medically-trained individuals is limited. This is the case in Bangladesh and Nepal, where only 13% children are delivered with a skilled birth attendant present. Rural areas accounted for 84% and 74% of the total population in Nepal and Bangladesh respectively in 2006. Thus, these are some of the reasons why the gap in coverage of skilled birth attendance is high between the rich and the poor, and has either remained the same or has increased between the 1990s and the post-2000 period (Fig 1).

More explicitly, in India, the richest 20% women are five times more likely to receive skilled birth attendants and, in Indonesia, they are four times more likely to do so than among the poorest 20% .

Figure 1: Inequities in skilled birth attendance between the poorest and the richest wealth quintiles, by country and by year of survey



WHO/SEARO, Jakarta 2008. Regional Conference on Revitalizing Primary Health Care, working paper and selected abstract of presentation

Legend: NEP: Nepal; IND: India; BAN: Bangladesh; INO: Indonesia; SRL: Sri Lanka; THA: Thailand

The presence of a skilled health professional and access to a well-equipped health facility make for a successful, non-complicated childbirth. This is an example of just one specific health service whereas PHC comprises eight essential elements: (i) education for health; (ii) essential drugs and medicines; (iii) locally endemic disease control; (iv) expanded programme on immunization;

(v) maternal and child health; (vi) nutrition; (vii) treatment of communicable diseases; and (viii) safe water and sanitation. If any of the eight are not well addressed, the health of populations will be at risk, which means that in the context of any crisis, the risk will increase. For the purpose of this paper, PHC will be discussed as a package of these eight essential elements.

As such, how do we strengthen health care against a background that pushes human survival to its limits? How do we make PHC a sustainable approach to disaster risk reduction? Are any changes needed or just by providing basic PHC properly will we be able to prevent the adverse health impacts such as outbreaks and poor provision of health services, etc.?

Crises and their impact on health systems in the SEA Region

Although the term “disasters” is sometimes used interchangeably with “crises”, both occur when local and national systems are overwhelmed and unable to respond to basic needs, putting the population's health, safety, security and well-being at risk^[2]. Humanitarian crises, whether natural or man-made or both², may be due to a sudden increase in demand, or because of weak systems and institutions (e.g. government and local services collapse due to staff shortages or lack of funds). The impact of humanitarian crises on health systems is often immense: a WHO survey showed that most countries (from 73% to 100%) reported facing a major emergency during the past five years^[3].

Global challenges may result to if not already turned into crises in various parts of the world. Crises in general that is a result of various hazards: natural (with impacts more enhanced by climate change); human-generated (conflicts, wars); and more complex ones in which global and internal migration, food, water, energy and financial crises play more of contributing factors.

Poor countries and poor populations are the most vulnerable to natural disasters. More than 90% of deaths caused by natural disasters occur in developing countries and least

developed countries suffer most of all^[4]. Although just 11% of people exposed to natural disasters live in low human development-classified countries, they account for more than 53% of recorded disaster-related deaths^[5]. This cannot be all the more true in the 11 countries of the WHO SEA Region. While this Region has only 5% of the earth's landmass, it has over a quarter (26%) of the global population, and South Asia (including Afghanistan and Pakistan) is home to 50% of the world's poor. The SEA Region accounted for over 44% of all disasters and 58% of deaths from natural disasters over the decade 1996–2005^[6].

First, let us understand the impact of crises on health systems.

First and foremost, health facilities and infrastructures are lost. A few examples of crises that occurred in the SEA Region in recent years describe the physical losses suffered by health systems. During the Gujarat (India) earthquake of January 2001, almost all health facilities at various levels suffered minor and major damage. There was total collapse of the health infrastructure in Kutch district, which was the worst affected. The cost of reconstruction for the health sector alone was estimated at US\$ 60 million^[7].

During the earthquake and tsunami of 26 December 2004:

- Thirty of the 240 health clinics in Indonesia's Aceh province were completely destroyed, 77 others were damaged seriously and 40 suffered minor damage.
- In Maldives, one regular hospital, two atoll hospitals and 20 health centres were destroyed. As many as 5000 people had to be evacuated from 13 islands^[8].
- In Sri Lanka, 92 health facilities, including 35 hospitals, were destroyed.

The above-mentioned figures demonstrate that disasters cause tremendous losses to development. They are a setback to investments that have been made to improve the health of

² There is no simple categorization of humanitarian crises. Various agencies have proposed a series of categories (see the Disaster Type List of the International Federation of Red Cross and Red Crescent Societies and/or the Handbook for Complex Emergencies of the United Nations Office for the Coordination of Humanitarian Affairs).

populations. Aside from direct economic losses, there also are indirect losses or those that are more difficult to quantify. All such losses delay the achievement of health goals.

Are PHC centres built to withstand hazards in the area where they are located? This is the big challenge for every health facility – they have to be built to withstand any natural or man-made event. Low-cost and effective technologies are available. Furthermore, non-structural interventions can also be put in place to further decrease the physical losses during an emergency^[9].

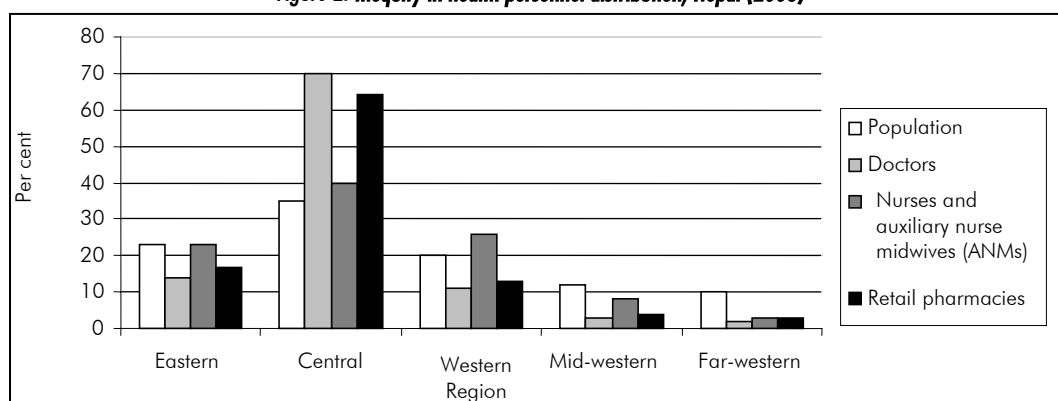
A disaster results in direct losses in terms of human resources engaged in the health sector; as many as 700 health workers (out of an estimated 9800 in the province) died or

were reported missing in Aceh, Indonesia after the Tsunami^[10].

During ongoing conflicts, many registered health professionals are unwilling to serve as their security and safety cannot be guaranteed. The same holds true for international humanitarian health workers.

Indeed, the functioning of health facilities is directly related to the presence and capacity of their health workforce. The concentration of health workers in urban or capital areas can be exacerbated by prolonged civil conflict. This is illustrated in Fig. 2 ^[11] below that shows that in Nepal, health personnel tended to move to and concentrate in the central region where they felt more secure.

Figure 2: Inequity in health personnel distribution, Nepal (2006)



Source: Data from Review of Nepal Health Sector Programme: A background document for the mid-term review, Mick Foster, John Quinley, et al. (October 2007)

Long-drawn civil and political conflicts impact on the skills of health personnel. Opportunities for quality training decrease and standards suffer, the working environment deteriorates for professional practice and competencies to grow, and behaviour and morale are affected^[12]. More often than not, the humanitarian response of short-course training that is ad hoc and unplanned does not augur well for the health system.

Access and quality of services suffer in any disaster. The infrastructure surrounding health

facilities also falls apart in the aftermath of a disaster. After an earthquake, a clinic without water will not have good infection control. A hospital that stands and is ready to receive casualties will be useless if the bridge and roads that connect it to an affected area are destroyed. All facilities with no new supplies of reagents, medicines, and more health professionals will provide services that may not be at par with the required clinical protocols. Thus, without resources and people, health services fail.

Examples of risk reduction through primary health care

As a concept, PHC offers a comprehensive guide on equity — what to prioritize, technology to be applied, socio-cultural aspects, target groups, full involvement of the community, cost-effectiveness and efficiency. If more is done with the eight basic elements and this approach in mind, then much of the health of populations can be protected during emergencies.

Will investing in PHC and in the delivery of its main elements reduce risks? A few examples demonstrate this^[13]:

- All health workers in Bangladesh are trained and equipped in the management of diarrhoea. This is part of the regular work and training for health professionals. During monsoon floods, extra attention is given to the management, prevention and control of diarrhoeal diseases. This effort has been supported for long, such that during the most recent floods of 2007, a case fatality rate of only 0.2% was observed for all types of cases of diarrhoea.
- In Myanmar, following the cyclone Nargis, the intensive larvicidal campaign to prevent a potential dengue and malaria outbreak in the cyclone-affected area was made possible only by tapping community health workers within a very well-structured health system. No outbreaks were experienced during the malaria and dengue season that set in weeks after the cyclone.
- In Indonesia, staff and management of health facilities are prepared to provide services in the aftermath of a disaster. A support mechanism for decision-making is being institutionalized nationwide to assist health workers in assessing and acting promptly on issues such as evacuation of people and normalization of affected services, as well as their

continued provision during the critical hours following an emergency.

- The physical structure of health facilities is a big issue that Nepal has started to act on. Hospitals in the Kathmandu valley and blood banks in selected areas in the country have been assessed for structural and non-structural vulnerabilities, and suitable interventions have been formulated. Emergency training provided to hospital staff proved to be useful in 2006 when Nepal's internal conflicts reached their peak. The trained hospital staff were fully ready to implement their conflict management knowledge and skills. Following this success, work on structural and non-structural assessment of PHC centres is also now being planned in Nepal.
- Following a successful nationwide campaign against measles in late 2004, Sri Lanka opted not to go in for emergency measles immunization as that would have been redundant and a waste of resources. A properly conducted immunization campaign protects populations from a sudden onset of disease that impacts on health.

It is sad that the proof of sound investments having been made by the health sector in risk reduction is visible in the event of a disaster itself. An emergency is the only moment that demonstrates the efficacy of health services, in the form of physically intact health care facilities being managed by capable health-care personnel.

Conclusions

Development inequities, discrepancies in access to health services and achievement of health goals across countries and within countries are a known fact. Most Member countries of the SEA Region have a total per capita health expenditure of less than US\$ 34 — the level recommended by the Commission on Macroeconomics and Health — for implementing an essential health

care package. This problem is further exacerbated by misallocation of funds to less cost-effective interventions, resulting in allocative inefficiency^[14].

As such, addressing the health needs in crisis situations becomes all the more challenging. It has been known that populations that are poor are not healthy, and therefore are more vulnerable to disasters. From example, it is known that there are gaps in investments aimed at making health systems resilient to crises, especially investments for PHC. When health facilities are well equipped, human resources are trained and PHC services are provided well before an emergency, it is possible to prevent the adverse health impacts of disasters.

A risk management approach to governance or development takes into consideration a more holistic view of the needs of people. As such, strategies and interventions become more appropriate since hazards, risks

and vulnerabilities are all taken into consideration. The health sector is not exempt from this premise, and proper and comprehensive investments for PHC can reduce risks for populations by:

- Building and maintaining existing health facilities that:
 - remain intact and functional against all hazards when they are needed the most — in emergencies; and
 - outlive an emergency by not adding to the burden of the community that needs to recover; and, maybe, even speeding up recovery and rehabilitation processes.
- Providing basic health services that protect the population from ill-health and disease in times of crises; and
- Providing an organized network for human resources in health to act in times of crises.

References

- (1) World Health Organization, Regional Office for South-East Asia. *Regional conference on revitalizing primary health care*. New Delhi: WHO-SEARO, 2008.
- (2) International strategy for disaster reduction glossary. (www.unisdr.org - accessed on 26 March 2009).
- (3) World Health Organization. *Global assessment of national health sector emergency preparedness and response*. Geneva: WHO, 2008. (http://www.who.int/hac/about/Global_survey_inside.pdf - accessed 26 March 2009).
- (4) International Strategy for Disaster Reduction. *Living with risk: a global review of disaster reduction initiatives*. Geneva: ISDR, 2004. (http://www.unisdr.org/eng/about_isdr/bd-lwr-2004-eng.htm - accessed 26 March 2009).
- (5) United Nations Development Programme. *A global report: reducing disaster risk: a challenge for development*. New York: UNDP, 2004. (http://www.undp.org/cpr/whats_new/rdr_english.pdf - accessed 26 March 2009).
- (6) International Federation of Red Cross and Red Crescent Societies. *World disasters report*. Geneva: IFRC. 2006.
- (7) World Bank, Asian Development Bank and Government of Gujarat and India. *Gujarat earthquake recovery program: assessment report*. World Bank and ADB, 2001. (http://www.preventionweb.net/files/2608_fullreport.pdf - accessed 26 March 2009).
- (8) World Health Organization, Regional Office for South-East Asia. *Moving beyond the Tsunami: the WHO story*. New Delhi: WHO-SEARO, 2005. (http://whqlibdoc.who.int/searo/2005/9290222425_eng.pdf - accessed 26 March 2009).
- (9) Guidelines for structural and non-structural vulnerability assessments for Hospitals in Kathmandu. Kathmandu: WHO Nepal, 2004.
- (10) Carballo M, Daita S, Hernandez M. *Impact of the Tsunami on health care systems*. Journal of the Royal Society of Medicine. 2005; 98(9): 390-5.
- (11) Mick Foster, John Quinley, Raghav Regmi, Binjwala Shrestha. *Review of Nepal health sector programme: a background document for the mid-term review*. Kathmandu, Development Consultancy Center, 2007. (<http://mickfoster.com/docs/final%20report%20nov%2020th.doc> - accessed 26 March 2009).
- (12) World Health Organization. *Analysing disrupted health sectors - Manual*. Geneva: WHO, 2007. (http://www.who.int/hac/techguidance/tools/disrupted_sectors/en/index.html - accessed 27 March 2009).
- (13) World Health Organization, Regional Office for South-East Asia. *WHO situation reports for various disasters*. New Delhi: WHO-SEARO. (www.searo.who.int/eha - accessed 26 March 2009)

Communicable diseases

Qualitative study on avian influenza in Indonesia

Soewarta Kosen*, Rachmalina S. Prasodjo*, Khanchit Limpakarnjanarat**, Oratai Rauyajin**
and Nugroho Abikusno**

As of 12 September 2008, human cases of avian influenza (AI) were found in 12 provinces of Indonesia (North Sumatra, Riau, South Sumatra, West Sumatra, Lampung, Banten, Greater Jakarta, West Java, Central Java, East Java, South Sulawesi and West Sulawesi). Of these, 137 were confirmed cases that resulted in 112 deaths. The case-fatality rate was high, around 82%: higher than that in other Asian countries.¹

A cluster of cases were found in 11 events, with the largest cluster being found in Karo district, North Sumatra, where out of the nine cases of AI, seven died. Poultry was identified as the major source of transmission.² Even though a thorough investigation was conducted to determine the source of infection for all cases, for 17.0% cases the mode of transmission could not be identified.³ A limited human-to-human transmission was suspected by experts as they had found adapted receptor 2.6 of H5N1 virus that has the potential for human-to-human transmission.

Indonesia is a vast country with a lot of cultural diversity. However, even after almost four years that the AI epidemic started in poultry, only a few social and behavioural studies had been conducted. Moreover, these studies had mainly been limited to the community's knowledge and attitudes concerning AI. Without an in-depth understanding of AI-related

behaviours and their underlying factors, such as communication for behavioural change and other interventions, it was likely that efforts to prevent AI will fail to gain active participation from the community, which is the key factor in achieving success in any disease prevention and control programme.⁴⁻¹⁹

This report is the result of a qualitative study undertaken in Phase I that explored the existing AI-related behaviours, and then followed it up with an in-depth analysis of socio-cultural factors that may promote AI risk behaviours or hinder preventive and prompt treatment-seeking behaviours related to it. It also analysed people's compliance with AI control measures. The role of local and traditional media in inducing AI-related behavioural change was also part of the study.

The knowledge gained from the Phase I study will be utilized in designing social interventions for behavioural change as part of the second phase.

The main objective of the study was to improve the prevention and control of the AI epidemic in Indonesia. The specific objectives were to: (1) Study community behaviour in respect of AI, including risk behaviour and preventive, treatment-seeking and compliant behaviour; and (2) Determine risk-behaviour factors related to AI.

Method

The study comprised two stages. The first or the problem-identifying phase involved an in-

*National Institute of Health Research and Development, Ministry of Health, Republic of Indonesia

**WHO Regional Office for South-East Asia, New Delhi

depth assessment of the socio-cultural factors related to behaviour that increase human exposure to AI. The methods used were a three-week participatory observation to study community behaviour regarding AI; an in-depth interview with key informants; focus group discussions; and secondary data collection. The second phase involved participatory action research aimed at behavioural modification of the affected community based on the findings of the first phase. This paper will report the results of the first phase of the study.

The informants, for the purpose of the study, consisted of patients' family members, breeders, bird sellers and community members, including formal and informal community leaders, multisectoral agencies, local health providers and policy-makers.

The locations selected for the qualitative study were north and south Utan Kayu (wood forest), a subdistrict in the East Jakarta municipality that represented the metropolitan community, the majority of which were large poultry breeders. Moreover, north Utan Kayu had recorded the first human case of AI found in Jakarta. At the time of the study, 25 cases of AI resulting in 22 deaths (88%) had been recorded in Jakarta. The Nagari Batu Banyak (country with many stones) subdistrict, Solok district in west Sumatra province; west Lombok district, west Nusa Tenggara province and Mojotamping village, Mojokerto in East Java, were the other locations selected for the purpose of the study.

The instrument selected for the study was open questionnaires that were used as guidelines for in-depth interviews, participatory observation and group-discussion themelists, all of which were directed at knowledgeable informants regarding poultry breeding and AI-related behaviours. The theme or content of recorded community behaviour related to thematic issues of AI was analysed.

Results

Social, economic and cultural features

All research areas were easily accessible to public transportation, even though reaching the village sites required the use of public motorcycles (*oyeks*), village transportation or even a horse coach. All areas were located near the river regularly used by the community to throw away dead birds or to clean chicken. Besides, a traditional market was located nearby where the poultry was usually bought and sold. The types of birds sold in these areas comprised chicken, ducks, geese and birds, as well as animals such as cows and pigs. All poultry were sold, bred and consumed as well as used in traditional ceremonies.

In Solok, Mojokerto and Lombok, chicken commands a high social value in the community. Particularly in Solok, chicken is used in the traditional wedding ceremony performed by the Minangkabau ethnic tribe. In Mojokerto, chicken is used as a traditional healer to identify or diagnose disease. In Lombok, the Balinese people often use chicken and its blood as an offering (*banten caru*) during religious rituals and traditional ceremonies.

Differences in behaviour were noted among communities living at the four locations because of the heterogeneity in respect of ethnicities that greatly influenced the community lifestyles. In Jakarta the different ethnicities had integrated into one to form a "melting pot" of the metropolitan population that dominated the community lifestyle. The Mojotamping village was dominated by Javanese ethnicity that exercised a more traditional and religious influence. Similarly, in Nagari Batu, Banyak was dominated by three major ethnicities, also exercising a traditional and religious influence. West Lombok was dominated by two major ethnicities, the Sasak Muslims and Hindu Balinese, both of which upheld the traditional ritual lifestyles in their activities.

Local health service system and programmes/activities related to avian influenza

In general, all the four study sites had similar health care systems including health facilities. The Public Health Centre (PHC) was near the general hospital and private hospital. It was quite easily accessible; it took approximately 30 minutes by public transportation to reach the centre. Health promotion on AI and related issues had been carried out at all study sites. Counselling and education on AI had been organized by related health providers, such as general practitioners (GPs) in primary health care (PHC), village midwives, health volunteers and other PHC health professionals who had participated in AI prevention and control programmes of the Ministry of Health.

Situation of avian influenza at different study locations

The situation regarding AI was different at different study sites. Although AI poultry cases were found at all sites, AI cases of human fatality were found in Jakarta, Mojokerto and Solok but not in Lombok where only poultry cases were found to be H5N1 positive.

AI-related risk behaviours and their influencing factors

Cultural pattern of raising poultry

The culture of raising poultry at the four sites showed that having chicken, ducks or birds in their houses and backyards was a very common practice for inhabitants. Behaviour towards raising backyard poultry (chicken, duck and geese) was found to be similar at all four sites. The poultry was left to roam freely and to subsist on any food sources available in the backyard during the day time. At night, the poultry was put in cages.

Most poultry cages at the four sites were found to be in residential areas, close to the houses. At all the four sites, the distance

between poultry cages and houses was found to be less than the recommended distance (10 metres or further). People were usually building the cages very close to their houses. In Solok and Mojokerto, cages had been built just behind the house walls. Some households in Jakarta had put the poultry underneath the house in basements, or had mostly built the cages less than three metres from their houses. Poultry cages had been built as close to the houses as possible because of safety reasons, as well as because of limited space available in the house yards.

Not all households were found to be cleaning the poultry cages properly and on a regular basis, nor were they using disinfectants. Mostly, they were cleaning the cages using water. They thought it unnecessary to use a soap or a disinfectant because of their belief that the bad smell would disappear anyway by using water.

Transportation of poultry

The improper manner in which poultry was being transported was found to be one of the risk behaviours associated with the occurrence of AI at the four sites. At all sites, poultry farmers used motor cycles and bicycles to transport the poultry. In Mojokerto, Solok and Lombok they only used bamboo cages to contain the poultry, while in Jakarta they used plastic cages to store the poultry in pick-up trucks.

The most risky behaviour was found to be the one where farmers did not separate the sick poultry from the healthy poultry while transporting them in bamboo cages. For chicken dealers, this was particularly the case because they only put chicken in cages temporarily before selling them. However, the study found that a few people in Lombok, Mojokerto and Solok did separate sick poultry from healthy poultry to avoid healthy chicken getting infected. The main reason behind this behaviour was the lack of space. Moreover, it was considered unnecessary to separate sick

poultry from healthy poultry because eventually the chicken was to be cooked and eaten.

Handling sick poultry

The behaviour of people towards sick poultry was found to be similar at all the four sites. Most community members treated sick poultry through traditional medication such as herbs or 'jamu', coconut oil or over-the-counter drugs that were affordable. This was because the community members assumed that AI would not spread from poultry to humans; hence, they thought that sick poultry was not hazardous for humans, and that it would remain edible as the disease would disappear upon cooking the sick poultry. However, some people thought that it was unhealthy to eat sick poultry. They preferred not to consume sick poultry as they were afraid of the disease (AI). Some people in Solok believed that dying of sick poultry was because of one's fate or God's will. Therefore, deaths caused by eating sick chicken were attributed to victims' fate rather than to sick chicken.

"...so far, no one has got sick by eating sick chicken. We have been eating sick chicken for years. If someone dies from eating sick chicken, it must be because of his/her fate and not because of sick chicken."

Informant, Solok

Behaviour towards dead chicken

Community behaviour towards dead chicken was also found to be similar at the four sites. The dead chicken was usually being disposed of improperly. In Jakarta, people were usually discarding dead chicken in the local household garbage dump, or returning dead chicken to the seller and having it replaced by healthy chicken. In Mojokerto, Solok and Lombok, people were usually found to be throwing away dead chicken in the river or in the rice or plant field. They believed that dead chicken would be destroyed by the strong river current. The practice was to discard the chicken carcass in the rice field or in a

plantation area as those were located relatively far from people's houses. It also helped them avoid the bad smell of the carcass. In other cases, carcasses were thrown onto a heap of bamboo shoots, under a banana tree, or in the backyard.

In Solok, particularly, people were found to be using chicken carcass as dog food. In some cases, chicken carcasses were actually being burnt and buried. Such community behaviour was similar to the practice of culling, which is a positive practice to prevent the further spread of AI, and should therefore be encouraged in the community. However, people had not adopted the practice in Jakarta because of limited space for burying carcasses.

"...we used to throw away the poultry carcass in the river or in a ditch nearby as we believed that the carcass will not emit foul smell this way."

Informant, Lombok

Handling of raw poultry meat

Most community members preferred to buy live chicken rather than chicken cutlets for meal preparation. They believed that cooking fresh chicken was healthier and tastier than cooking processed chicken. They slaughtered the live chicken using the same knife and other utensils that were used for other foods as well. Handling raw poultry meat and other food items with the same knife and utensils is risky behaviour, especially if the raw meat happens to be contagious or has been sourced from sick poultry.

Consumption of sick/dead poultry

Most community members at the four sites were continuing to consume sick or dead poultry as a habit. In fact, they believed that as long as they were cooking the sick or dead poultry properly, the virus would disappear. At the same time, there were others who did not

eat sick or dead poultry due to the fear of contracting AI disease.

"...nothing to worry about eating sick chicken if we boil it. Boiling will kill the virus and bacteria in the chicken completely. Thus, it is safe to eat the sick chicken after boiling it."

Informant, Jakarta

Preparation of egg meal and its consumption

The community behaviour regarding cleaning of eggs before cooking them tended to be risky. This was because community members were not washing the egg skin to remove dirt or other impurities from it. They believed that eggs would become clean anyway when they cooked them. Moreover, they assumed that eggs from the wet market were already clean.

As in most parts of Indonesia, consumption of raw eggs was found to be common at the four research sites. Most people believed that raw eggs were good for health. They usually consumed raw eggs mixed with honey, tea or soft drink to cure particular diseases such as haemorrhoids, as well as to increase body stamina and vitality. However, such a practice entailed the risk of a person contracting a virus or getting infected with germs from the dirt on the eggshell that may get dropped unnoticeably onto the plate while the egg was being broken for cooking. This could happen when the eggs had not been cleaned and washed first.

"...it is our habit that we don't wash the egg skin because we are sure we have already selected clean eggs while buying them."

Informant, Solok

Habit of playing with poultry

Playing with poultry without proper personal protection constitutes one of the risk behaviours towards contracting AI. In Jakarta, Mojokerto and Lombok, most people were found playing with poultry either for

competition or gambling. At Solok and Lombok, it was found that children liked to play with chicken in their daily lives. Thus, they were getting directly exposed to poultry dirt/faeces because they were playing with poultry without personal protection.

Use of poultry excreta as plant fertilizer

It was found that people at all four sites were improperly using poultry excreta including duck faeces directly as plant fertilizer without any sanitary precautions. This too constituted a risk behaviour towards the spread of AI. In Jakarta, Mojokerto, Solok and Lombok, most people did not clean the poultry excreta immediately before using it as plant fertilizer. They were thus directly getting exposed to poultry faeces as they were not using personal protection. People were unaware of the hazardous effect on their health of unclean and unhealthy behaviour involving daily contact with animals and poultry without personal protection equipment such as gloves, masks (to cover the nose and mouth) and working coats to minimize the risk of infectious diseases from poultry and animals.

"...people here are not used to cleaning the chicken cage. We are not allowed to clean it due to certain reasons. First, because the chicken dirt mixed with rice skin will make the dirt dry. The dry dirt will make our chicken stay healthy. Secondly, we still want to make it (dry excreta) more quickly and do not clean it, so it can be used as fertilizer in the paddy fields."

Informant, Solok

Poultry such as chicken and ducks, as well as animals such as pigs, have a very close relationship with the community's cultural and religious activities. People still value poultry and animals above their concern for the risk of contracting AI. Moreover, they do not have adequate knowledge on AI's prevention and control.

Preventive behaviour with regard to AI, and its influencing factors

Use of personal protection

It was noticed that most people were not wearing personal protection when they were in contact with poultry or cleaning its cages. Using personal protection equipment was not their habit because they found it uncomfortable and too hot to use. They also thought personal protection to be unnecessary. Although health education on the merits of personal protection in preventing AI had been imparted to communities in Mojokerto, Solok and Lombok, some people still preferred not to use personal protection because they felt safe enough without it.

"...we usually clean up the cage without using hand gloves and masks, etc. I think it is not necessary because after that we always wash our hands with water."

Informant, Solok

Handwashing with soap

Proper handwashing with soap as a preventive behaviour was not found to be commonly practised in the community at all research sites. People mostly washed their hands without soap. Moreover, they did not always wash their hands after direct contact with poultry, such as when cleaning the cage or backyard of poultry faeces and dirt. Some people in Mojokerto and Solok used river water not only for washing or bathing but also for discarding poultry carcasses. They felt that the river water was clean enough to be used for washing. They did not perceive their hands to be dirty and thus needing to be cleaned.

"...we wash our hands before performing morning prayers, and after that we never wash our hands, even though we have to cook, prepare food for the family, because we feel that our hands are still clean, so it's not necessary to wash our hands all the time."

Informant, Solok

Treatment-seeking behaviour with regard to AI, and its underlying factors

Self-treatment behaviour

All research sites except west Lombok had had human AI cases in their respective areas. In general, the health-seeking behaviour regarding AI diseases was found to be similar. Most people tried to treat themselves at home through over-the-counter drugs obtained from drug or convenience stores, while some tried self-medication by consuming traditional herbs or drinks. They felt that influenza was only a common disease that could be cured by self-medication or traditional herbs.

Health-seeking behaviour

Following self-treatment, people usually sought professional medication, such as through primary health care or a private doctor, when they found the symptoms to continue beyond two to three days.

In Jakarta, Solok and Mojokerto people started to seek care following the onset of more severe symptoms. It could be said that patients did not delay seeking care. However, the health provider (usually a paramedic or physician in the village) dispensing front-line treatment provided patients with only common-illness medications with the result that AI patients were referred to the appropriate hospital at an advanced stage. This was resulting in a high case-fatality rate for AI in Indonesia. Most cases were not aware of AI-specific symptoms due to their similarity with symptoms of the common cold.

Response to avian influenza and its underlying factors

People were found to be actually aware of the need to immediately respond to AI cases. At all research sites, it was found that community members were reporting to local authorities promptly. However, local authorities were not responding as quickly as the community

members expected them to. In a particular case in Jakarta, a chicken owner had to wait for a long time before the agriculture field worker could visit his home. This shows that in Jakarta the coordination between related sectors at the village level should be more properly geared to handle cases of AI efficiently. Meanwhile, the coordination between the health and agriculture sectors, and the local community appeared to be better in Lombok, Mojokerto and Solok.

Discussion

It has been long recognized that the success of any health education programme is dependent on how it is understood, accepted and implemented by the learners. This means that successful health education is not achieved by merely 'injecting' scientifically-based messages into learners. To be successful, health messages must be understandable and relevant to the local socio-cultural situation of the community, so it will resonate with the targeted learners and impact their behaviour.

Lack of knowledge about AI was causing communities to perceive their susceptibility to AI as low. Moreover, traditional beliefs and practices were hindering AI prevention and control measures in Indonesia. As a result, health promotion programmes are unable to reduce human exposure to sick and dead poultry or enhance effective and prompt diagnosis and treatment leading to reduced AI case-fatality rate. During the present study, it was found that community members were not complying with the recommendation of using personal protection such as gloves and masks due to it not being practical, besides being costly and not commonly used. Hence, it is felt that more culturally appropriate and affordable technologies should be explored. People who buy chicken from the local market where live chicken are sold might be at risk of AI because they are in contact with live chicken without knowing whether the chicken are sick or not. Moreover, they are also at risk by not

using any personal protection such as hand gloves while handling these chickens.

Most community members at the research sites did not slaughter poultry properly. This practice further made them more susceptible to AI infection as they were not using any personal protection at all, even though the majority of people in the community slaughtered poultry in the Muslim way (*halal*) due to traditional customs and religion-based reasons.

Community members usually sought care from front-line health facilities only a few days after they exhibited minor AI symptoms, which were considered by them as being indicative of merely a common cold. In addition, the front-line health-care providers (private practitioners such as paramedics or physicians) often treated AI symptoms as common ailments. This further delayed the patients from receiving effective AI treatment from the relevant AI health facility in the area. All these reasons led to a high AI case-fatality rate. The availability and accessibility of effective AI health facilities should therefore be enhanced by the national health care system.

Though some people were already aware about the need to clean their backyards and houses, unfortunately they were not cleaning them properly. They were only cleaning their houses from outside – more for aesthetic rather than health reasons. Furthermore, people were rarely cleaning the back portions of their houses, especially the toilets, as well as dishwashing areas inside the house. Rare and expensive humming birds were often kept in cages located near the ceiling (making it difficult to clean them) as a showcase for guests to admire.

Health promotion activities advocated by animal husbandry agencies have only been carried out occasionally, rather than on a continuous basis by the community due to strong traditional customs and economic reasons. Moreover, the demand for stamping out poultry (culling) without adequate compensation was often rejected by community members. Thus, alternative

interventions that are socially accepted, such as behavioural change interventions, should be explored in order that diverse ethnic communities in Indonesia can adopt them.

There are certain factors that influence the community's AI-related risk behaviour. However, behavioural change in the community occurs only temporarily after the occurrence of an AI case is reported in the area. The list in the Annex summarizes the AI-related risk behaviours and their underlying factors, as well as the key prevention messages to be conveyed within the socio-cultural context of the respective study areas. This will be the focus of Phase II of the study.

Conclusions and recommendations

Conclusions

- (1) The traditional or customary ways of life in Indonesia have brought about a wide range of AI-related risk behaviours. Chickens and birds play important roles in social and cultural activities and in ritual ceremonies. The close relationship that people and poultry share has exposed humans to the risk of AI through infected poultry. The traditional practice of backyard and open-range poultry-raising, as well as of placing poultry cages in close proximity to homes greatly increase the risk of H5N1 infection between poultry and humans.
- (2) The role of the community in environmental sanitation related to animal husbandry is still low. A wide range of traditional and cultural beliefs have given rise to practices that are considered barriers to AI prevention and control. These include improper handling of sick and dead poultry; eating sick and dead chicken, and raw and half-cooked eggs; using raw poultry blood in

ceremonies; hand-washing without soap; and not cleaning ducks' faeces from cages due to the traditional belief that dry dirt can keep them healthy.

- (3) The community members needed to be educated more about AI and its risks because of members' perception that their susceptibility to AI was low. This misconception led to members' belief that adopting personal protection measures would extract a higher psychological cost from them rather than provide them with any benefits. Hence, most of them did not practise preventive behaviours with regard to AI.
- (4) Although AI patients started seeking treatment directly after their perception of the severity of symptoms, in the initial stages they were often treated by front-line health providers (private practitioners) in the belief that they were suffering from only common ailments. This lack of knowledge led to patients receiving proper treatment at the relevant AI facility only at the advanced stage of the disease.
- (5) Many people did not comply with the standard control measures including non-reporting of sick and dead poultry, and not allowing poultry being culled for both economic and traditional-cultural reasons. However, they accepted to disinfect cages through spraying and poultry vaccination, not due to their perceived values in AI prevention and control measures, but due to them being provided free of charge.

These findings implied the ineffectiveness of the available health education and communication programmes i.e. key messages on AI to be conveyed in increasing AI awareness, knowledge, perceptions as well as preventive and compliant behaviours.

Psycho-social, economic and cultural factors played important roles in human exposure to poultry. Inaccessibility to effective AI treatment facilities and incapability of primary health care provider's (frequently private practitioners such as paramedic or physicians) in AI diagnosis were crucial factors contributing to a high AI case-fatality rate in Indonesia.

Recommendations

At the policy level

- (1) To scale up the national AI prevention and control measures, all the findings and recommendations from this study should be integrated into the existing National Policy on Alert Village Model (*Desa Siaga*) for Community Empowerment and Development of the Ministry of Health, Indonesia. Furthermore, the national AI prevention and control programmes should be strengthened through close collaboration between the health and agriculture sectors at all levels, from the national policy level to the community action level, especially in villages.
- (2) The existing disease surveillance measures are not adequate for reducing the high case-fatality rate in Indonesia. Thus AI prevention and promotion, as well as community-based AI surveillance should be strengthened. Furthermore, risk behaviour with regard to AI should be modified through effective communication and health education programmes.
- (3) In order to gain active community participation for AI prevention and control activities, all stakeholders involved, including women associations; loans and savings activity groups (*Arisan*); women community and religious gatherings (*Pengajian*); community and religious

leaders; local authorities including policy-makers; field workers from health and agriculture sectors; and relevant nongovernmental organizations, *Posyandus* (integrated health posts) should be part of innovative health education programmes. Role-play techniques (by combining printed material with interpersonal communication) should be imparted to mothers as they have important roles in Indonesian households. All these stakeholders need to work in close collaboration as equal partners in community-based surveillance and communication for behavioural change interventions, facilitated by health and agriculture field workers.²⁰

At the implementation level

- (1) Communication for behavioural change strategies, including advocacy with local authorities, social mobilization, community empowerment and primary health care approaches, should be employed using the Phase 1 results as inputs for designing strategic messages for changing beliefs and practices. This would help reduce human exposure to sick and dead poultry, as well as promote health-seeking behaviour to prevent a rise in AI case-fatality rate.
- (2) In order to reduce human exposure to poultry and to enhance preventive and prompt treatment-seeking behaviour, community-based communication programmes for behavioural change interventions should be developed.
- (3) The availability and accessibility of effective health facilities for treating AI should be enhanced by the national health care system. People should be educated on the early signs and symptoms of AI, and provided

information on the nearest location of effective health facilities for treating AI through information, education and communication (IEC) mass campaigns.

- (4) Health-care providers associated with AI prevention and control activities should not only be ready to prevent an AI pandemic but to also prevent its spread at the initial stage itself while discharging their "front-line" primary health care functions. Every health centre should be ready to treat suspected AI cases exhibiting symptoms of cough and severe

respiratory distress, as well as those with a history of exposure to poultry.

At the local level

The existing risk behaviours in respect of AI need to be modified through effective communication programmes on behavioural change. And, in order for the community to accept these programmes, a socio-cultural assessment could be employed for designing key messages for behavioural change, based on specific socio-cultural, socioeconomic and socio-geographic backgrounds.²¹

References

1. Update: WHO-confirmed human cases of avian influenza A (H5N1) infection, November 2003 – May 2008. Weekly Epidemiological Record. 2008 Nov 14; 83(46): 415-20.
<http://www.who.int/wer/2008/wer8346.pds> - accessed 4 March 2009.
2. Olsen SJ. Family clustering of avian influenza A (H5N1). Emerging Infectious Disease. 2005; 11(11): 1799-1801.
<http://www.cdc.gov/ncidod/EID/vol11no11/pdfs/05-0646.pdf> - accessed 4 March 2009.
3. Writing Committee of the Second World Health Organization Consultation on Clinical Aspects of Human Infection with Avian Influenza A (H5N1) Virus. Update on avian influenza A (H5N1) virus infection in humans. New England Journal of Medicine. 2008 Jan 17; 358(3): 261-273.
<http://content.nejm.org/cgi/content/full/358/3/261> - accessed 23 December 2008.
4. Food and Agriculture Organization. Prevention and control of avian influenza in small-scale poultry farmers: Guidebook for veterinary paramedics. (In Indonesian). Food and Agriculture Organization & Agronomes & Veterinaires Sans Frontieres (VSF-CICDA), Departemen Kesehatan Ternak (Kerajaan Kamboja); 2005.
5. Academy for Educational Development. Participatory action research on avian flu communication: summary report and recommendations. Washington: AED, New York: UNICEF, 2007.
6. World Health Organization, Regional Office for South-East Asia. Bird flu: what you need to know and do. New Delhi: WHO-SEARO, 2006.
http://www.searo.who.int/LinkFiles/Avian_Flu_bird_flu.pdf - accessed 24 November 2008.
7. Depkominfo. Bird flu: threat and prevention. (In Indonesian) Jakarta: Departemen Komunikasi dan Informatika; 2006.
8. Depkes RI. Guidelines on prevention and control of bird flu for Health Providers. (In Indonesian). Jakarta: Pusat Promosi Kesehatan Departemen Kesehatan RI; 2006.
9. Sarikaya O, Erbaydar T. Avian influenza outbreak in Turkey through health personnel's views: a qualitative study. BMC Public Health. 2007; 7: 330.
10. Muzaham, F. Introduction to Health Sociology. (In Indonesian). Jakarta: UI Press; 1995.
11. Shinya K, Hatta M, Yamada S, Takada A, Watanabe S, Halfmann P, Horimoto T, Neumann G, Kim JH, Lim W, Guan Y, Peiris M, Kiso M, Suzuki T, Suzuki Y, Kawaoka Y. Characterization of a human H5N1 influenza A virus isolated in 2003. Journal of Virology. 2005; 79(15): 9926-32.
12. Fielding R, Lam WW, Ho EY, Lam TH, Hedley AJ, Leung GM. Avian influenza risk perception, Hong Kong. Emerging Infectious Diseases. 2005; 11(5): 677-82.
13. Food & Agriculture Organisation. Prevention and control of avian flu in small scale poultry: a guide for veterinary paraprofessionals in Vietnam. Republic of Vietnam: Department of Animal Health; 2003.
http://www.fao.org/docs/eims/upload/206313/Almanual_vietnam_en.pdf - accessed 24 November 2008).
14. Simanjuntak G, Widarso HS, Lingga JG. Bird Flu Epidemiology (In Indonesian). Paper presented in Seminar on South Sumatra facing the threat of Bird Flu: Public health perspective. Palembang, 10 December 2005.
15. Hahn, RA. Anthropology in public health, bridging differences in culture and society. New York: Oxford University Press; 1999.

16. McKenna, M. Avian flu prevention puzzle: linking knowledge, action. Delaware: Center for Infectious Disease Research and Policy (CIDRAP); 2007.
17. McMurray, A. Community health and wellness: a sociological approach. Sydney:Harcourt; 2001.
18. Studies on Bird Flu (In Indonesian) Info Litbang. <http://www.litbang.depkes.go.id>
19. Control of Bird Flu (In Indonesian). <http://www.depkes.go.id/articleswindow.php>
20. Departemen Pertanian. General guidelines on poultry restructuring through Poultry Management in Housing Areas. (In Indonesian). Direktorat Jenderal Peternakan, Direktorat Budidaya Ternak Non Ruminansia, Departemen Pertanian; 2007
21. Abikusno N. Sociocultural aspects of the aged: a case study in Indonesia. Asia Pacific Journal of Clinical Nutrition. 2002; 11(suppl 1): S348-50.

Annex

List of AI-related risk behaviours and their underlying factors

Risk behaviour	Underlying factors
1. Raising poultry without cages (back-yard poultry).	– To subsist on available food sources in the backyard including food leftovers and garbage.
2. Putting poultry cages next to/ underneath the house or in the kitchen.	– For safety reasons, easier to protect poultry from theft. – Limited space for placing cages.
3. Placing sick and healthy poultry together in the same cage/basket/box.	– Lack of space to provide for separate cages. – It is costly to provide separate cages. – It is practical and is a community practice.
4. Improper cleaning of poultry cages.	– People's perception of their susceptibility to AI. – Having a different perception and understanding of the term "cleanliness". – It is costly to use disinfectants for cleaning cages. – To avoid having wet soil beneath the floor of cages (Solok). – Traditional belief that cleaning the duck faeces may bring about sickness for ducks.
5. Improper disposal of the poultry carcass.	– People's perception of their low susceptibility to AI. – The belief that poultry carcass does not cause any diseases in humans. – The carcass can decay by itself (in the river or in the garden). – Disposal is practical, easy, and involves no cost.
6. Eating sick/dead chicken.	– It is a good source of protein for economically poor families. – The poor believe that sick/dead chicken are safe to eat provided they are boiled first.
7. Food handlers at home and in the wet market use the same knives and utensils for slaughtering/preparing chicken and other food stuff.	– Limited space available in the chicken facility/market stall. – The belief that if the chicken is immediately cooked after cutting, it is considered safe.
8. Eating half-cooked or uncooked poultry eggs as supplementary food (e.g. 'jamu').	– The belief that having raw or half-cooked eggs makes the body stronger and healthier.
9. Children playing with chicken and birds	– Poultry is considered part of the family and has an important place in the community's social life.

Risk behaviour	Underlying factors
Preventive behaviour	
1. Non-use of personal protection equipment when touching or handling poultry, cleaning the poultry cage, and handling/using poultry faeces as a fertilizer.	– It is a common practice in the community. – It is inconvenient to work wearing hand-gloves. – It is costly to buy gloves.
2. Not washing hands with soap after touching/handling poultry, cleaning cages, feeding and slaughtering, etc.	– Different perceptions of the meaning of the term “cleanliness” “... it (water) is clean enough without soap”
Health-seeking behaviour	
1. Self-treatment by using unprescribed drugs from the drug store or convenience store; consuming traditional herbs.	– The belief that influenza is a common disease that can be cured through self-medication or traditional herbs.
2. Visiting local healers and using healing water or consuming <i>jamu</i> or herbal drink.	– People usually try to cure the ailment by themselves first, and consult with the local healer later.
3. Visiting a private practitioner (paramedic or physician) and a frontline health clinic providing primary care services.	– Patients are often wrongly diagnosed by frontline health care providers as suffering from common flu. However, after the illness turns severe, patients are eventually referred to provincial health facilities that are better equipped to handle human cases of AI.
Compliant behaviour	
1. Non-reporting of sick/dead poultry by farmers to the local authority.	– Not perceived as a major problem. – People can treat sick poultry by themselves. – The belief that sick and dead poultry can be consumed.
2. Non-compliance with poultry-culling regulation.	– Strong psychological and economic reasons, as stated under various risk behaviours.



Notes and news

Regional meeting of Administrative Officers' Network

Addressing the Regional Meeting of Administrative Officers' Network held in SEARO, New Delhi, from 23 to 25 September 2008, the Regional Director, WHO South-East Asia Region, Dr Samlee Plianbangchang, said, "Administration and finance functions provide crucial support to the development and management of our technical programmes. Hence, I always attach special importance to these two areas, in respect of both country offices and the Regional Office. Our budget is increasing, especially in respect of Voluntary Contributions. We have to utilize the available funds in a timely fashion. We are now almost into the tenth month of the first year of the current biennium; thus far, the average rate of our programme implementation is not at all satisfactory, especially at the country level. This issue is especially of concern in view of the new financial regulations and financial rules, whereby we have to disburse all Assessed Contributions by the end of the biennium. This aspect must also be seen in the light of our difficulties due to the transition from our past practices to the new Global Management System (GSM)."

The Regional Director continued, "We have to accelerate the implementation rate. At the same time, we have to ensure the quality of financial obligations, as well as their timely liquidation. In the process, we will have to make a lot of adjustments in workplans, especially in responding to the current and changing needs of countries."

Dr Samlee concluded, "To a certain extent, our management, including programme development and implementation, will be affected by GSM development. This is really a complex process. However, we have to be patient and maintain a positive approach to the development of GSM. And of course, we must try to do our best to minimize the adverse effect of GSM development on our management."

Annual consultative meeting of Nippon Foundation/Sasakawa Memorial Health Foundation

The Annual Consultative Meeting of Nippon Foundation/Sasakawa Memorial Health Foundation (TNF/SMHF) was held in the Regional Office on 6-7 October 2008. Delivering his remarks on the occasion, the Regional Director, Dr Samlee Plianbangchang, said, "The world has now almost reached the goal of leprosy elimination by bringing down the leprosy prevalence rate to less than 1 per 10 000 population. This achievement is to a great extent due to the continued commitment of TNF/SMHF to this global effort. Only very few countries are still left to accomplish the task. Leprosy is, however, still prevalent, but at a low rate and, the prevalence rate of leprosy keeps declining. Worldwide, the number of total detected cases in 2007 was 255 000. The global detection of new cases has declined by 11 000 cases (4%) between 2006 and 2007. Our efforts in future would be to maintain the low prevalence rate of leprosy in order to ensure that it would not become a problem of public health importance again. At the same time, we have to further reduce the

disease burden of leprosy — the burden in medical, social and economic terms.”

Stressing the need for an improved strategy, Dr Samlee continued, “The current strategy for leprosy programme needs critical review with an eye on “innovation”. Let me underline that leprosy is a disease of poverty and misery — one that is inextricably linked to the social and economic dimensions of a community. There is thus a need for a strong technical back-up for leprosy programmes, as well as for a strong multidisciplinary and multisectoral coordination in programme development and implementation. The leprosy programme needs to be more strategic and “more innovative” in future in order to ensure a progressive reduction in the disease burden.”

The Regional Director concluded, “Leprosy is a very unique disease with a century-old history. Its determinants and risks are also embedded firmly in the social and cultural milieu of the affected populations. There is, therefore, a good reason to keep the leprosy programme as a separate entity, at least in WHO. This is as long as the disease agent is still circulating among the human population. Its eradication from this world will be a very long journey.”

Regional launch of *The World Health Report 2008*

The Regional Director, Dr Samlee Plianbangchang, inaugurated *The World Health Report 2008* at the regional launch of the publication at SEARO on 23 October 2008. In his address to staff members at the programme, Dr Samlee pointed out that the report commemorates the 30th anniversary of the historic Alma Ata Declaration on Primary Health Care (PHC), and reiterated its importance. “The PHC approach was conceived as the key to the Health For All (HFA) goal. HFA is the attainment by all people of the level of health that will permit them to lead a socially and economically satisfied and productive life. HFA is a social goal and not

simply a health goal; whereas PHC is the key to this social goal,” he said.

Reiterating the continuing relevance of PHC in health policy-making and the holistic development of health systems, Dr Samlee said, “PHC must be recognized to encompass care for all people, rich and poor, urban and rural. PHC is quality care at low cost; it is first-class care ... and must be recognized as one of the main approaches to human resource development.”

Calling primary health care “one of the principal tools for ensuring the quality of human capital”, Dr Samlee stressed that PHC “is a cross-cutting area and, therefore, is everybody’s business”. Recalling the discussions at the recent conference on revitalizing primary health care in Jakarta, Dr Samlee concluded by saying that “the PHC approach must be used by all programmes (since it) is an important ‘change process’ and PHC workers are key ‘change agents’.”

Meeting of Roll Back Malaria Partnership Board

The Regional Director, Dr Samlee Plianbangchang, addressed the inauguration of the 15th Meeting of the Roll Back Malaria Partnership Board held at SEARO on 11-12 November 2008. This was the first meeting of the Roll Back Malaria (RBM) Partnership Board held in the WHO South-East Asia (SEA) Region. India, which is one of the countries affected by the disease, represents the SEA Region as a member of the Board.

Half the world’s population of nearly 7 billion people is at risk of malaria, and an estimated 250 million cases led to nearly a million deaths in 2006. Dr Samlee Plianbangchang noted with concern that “malaria remains one of the major public health problems in the South-East Asia Region”. The burden of malaria in this part of the world is second only to that in Africa, he said.

Dr Samlee also recalled that Member States had committed themselves to working coordinatedly in their fight against the disease at the sixtieth session of the WHO Regional Committee for South-East Asia in Thimpu, Bhutan, in 2007. This year Member States of the Region also joined in the global observance of the first “World Malaria Day” on 25 April.

“During the past few months we had witnessed a number of important developments in connection with malaria control, including the launch of the *World Malaria Report 2008*, the start of the Global Malaria Action Plan, and the pledge by donors of around US\$ 3 billion to fight this pernicious scourge. This is ... a bold step forward in the global endeavour to combat malaria. This meeting of the RBM Partnership is another milestone in the global efforts at malaria control and elimination,” Dr Samlee concluded.

The Sixtieth Regional Director’s Meeting with WHO Representatives

The Sixtieth Regional Director’s Meeting with WHO Representatives was held in the Regional Office from 17 to 25 November 2008. Delivering his opening remarks on the occasion, the Regional Director, Dr Samlee Plianbangchang, said, “Since our meeting in November last year, another year of hard work has passed. I thank you all, WRs as well as other WHO staff members in the Region, for your dedication and commitment. All Member States appreciate your hard work; they also perceive positive changes to which WHO staff members have contributed. These are changes at country level, in particular, in national health systems, and in countries’ health situations. In the process of our collaboration with Member States, we should let the countries have an opportunity to assess our work and performance. Let the Member States judge how much and how well WHO has done for them. Certainly, we will continue to assess and evaluate our programmes to see how efficient and effective we are in our collaboration with countries.”

Dr Samlee continued, “These two things are now critically important to programme budget implementation at the country level. In this connection, there will be a session to review the comments and observations of the auditors, and also other relevant findings that are important for all of us. We should realize that a lot more needs to be done to improve the quality of our programme implementation, and of our work at the country level. The credibility and reputation of our Organization depend, to a large extent, on our performance in implementing collaborative activities in countries. We need to do a better job, as far as the technical quality of our work is concerned. We should not just try to spend a sizable amount of funds, without regard to quality.”

Dr Samlee concluded, “We have to be much more collegial in our style of working. And even more important, in order to overcome the bureaucratic hurdles, we have to be brave enough to think and do things “outside the box”. We will be brave enough when we are confident that we are honest, sincere, transparent and accountable. We have to maintain the highest level of our professional ethics and integrity. To be collegial, we have to be adequately interested in the people around us, and in organizational behaviour. We have to work with a positive attitude, and be supportive and ready to help others. We have to be adequately sensitive to the concerns and feelings of other people. We have to strictly observe and practice our “code of conduct”. In performing our functions, we have to make sure that there is no conflict of interest.”

Regional Director addresses joint opening of key TB and HIV meetings

The Regional Director, Dr Samlee Plianbangchang, addressed the joint opening of the 13th Meeting of the National TB Programme Managers and the 20th Meeting of National AIDS Programme Managers of the SEA Region, through his message delivered on 2 December 2008. Both the meetings were held in Male, Maldives.

Dr Samlee welcomed these meetings, which he said “continue to serve as useful forums to review progress, share experiences, address challenges and constraints, identify priority areas and plan effective implementation of interventions” to combat diseases, in this case HIV/AIDS and TB, two of the deadliest threats to the health of the people of South-East Asia.

Reiterating the importance of global widely-inclusive partnerships with private and public sector health-care providers, Dr Samlee reminded the participants that “there is still a long way to go in effectively expanding the reach of services (and) work remains to be done to inform and mobilize people so that they use available services in a timely manner.” Innovative strategies have to be developed through operational research.

Dr Samlee concluded, “Though HIV infection rates have begun to decline in several countries in the Region, the epidemic is not yet over—thousands of new infections continue to occur among populations with high-risk behaviours. Therefore, the foremost priority is to do a better job of prevention. Since the scale-up of ART began in late 2003, there has been nearly a ten-fold increase in ART coverage. But the downside is that three out of four people with advanced HIV infection who need treatment are not receiving it. Access to counselling, testing and anti-retroviral prophylaxis for HIV-infected pregnant women is even lower. Further progress in the HIV/AIDS and TB response depends on improved health systems and service delivery capacity.”

WHO Press releases

Diabetes Summit for SEA Region raises clarion call for partnerships

Global health experts, health ministers, donors and national health authorities met in Chennai, India, for the Diabetes Summit for the South-East Asia Region that was flagged off on 28 November, to discuss strategies aimed at

tackling the escalating rates of diabetes, one of the most significant health challenges of the 21st century.

The Summit was organized by the World Diabetes Foundation (WDF) in collaboration with the WHO SEARO, the International Diabetes Federation (IDF) and the World Bank. Participants represented development and funding agencies, WDF project partners, local diabetes associations, health-care providers, academics, policy-makers, NGOs and the media from across the SEA Region.

The Diabetes Summit highlighted the approach that the Foundation and developmental partners are taking to tackle diabetes. Of all chronic NCDs, diabetes is associated with the highest co-morbidities and complications. In 2007, diabetes resulted in 3.8 million deaths globally (6% of world mortality), the same figure as HIV/AIDS.

The World Diabetes Foundation is one of the largest funding sources for projects directed at preventing and improving access to diabetes care in the developing world. The Foundation will showcase six major projects across India in the area of capacity-building of health-care professionals, public awareness, gestational diabetes, primary prevention interventions in schools, and diabetic foot-and-eye-care projects to demonstrate how effective collaboration can work at the practical level, explained Dr Anil Kapur, Managing Director of the World Diabetes Foundation.

New book to boost health effort in Asia and the Pacific

Countries in Asia and the Pacific have reached unprecedented levels of prosperity, but millions of people are still mired in poverty and poor health with no sign of their being able to breach the barrier to better medical care. Despite irrefutable evidence of this troubling gap between rich and poor, few governments and health specialists have access to the data they need to address the problem. This is why the World Health Organization's two regional

offices that cover Asia and the Pacific have produced a “one-stop” publication that will, for the first time, provide countries with the truly pan-regional information they need to provide better health for all.

The 540-page report comes at a crucial time for public health, with the global economic downturn threatening to dry up public funds and curtail governments’ spending power. With fiscal pressures in affluent countries threatening to prompt cuts in development assistance for poorer nations, WHO calls on governments and political leaders to look beyond the economic crisis and to continue to invest in public health. WHO has also warned of growing threats on the health front, including emerging diseases such as avian influenza, resurging traditional diseases, and relatively new challenges such as lifestyle illnesses, including diabetes and cancer.

The new publication, *Health in Asia and the Pacific*, was jointly produced by WHO’s Regional Offices for South-East Asia and the Western Pacific, which between them cover 48 countries and areas. The population of the two regions is 3.45 billion people, representing more than half of humankind.

Executive Board confirms Dr Samlee’s appointment as Regional Director

The 124th session of the Executive Board has confirmed the appointment of Dr Samlee Plianbangchang as Regional Director for the South-East Asia Region for a second term: March 2009 to February 2014.

The session opened in Geneva on 19 January 2009. Among the issues on the agenda are:

- monitoring the achievements of the health-related Millennium Development Goals;
- recommendations of the Commission on Social Determinants of Health;

- agenda for action on primary health care;
- WHO’s role and responsibilities in health research; and
- draft code of practice on health personnel recruitment.

Presenting her report to the Executive Board, Dr Margaret Chan, Director-General (DG), WHO, said, “Climate change and preparedness for an influenza pandemic are items on the agenda. Both events will cause global humanitarian crises. The health effects of more frequent and more severe extreme weather events are already being felt. Influenza pandemics are historically recurring events. We are wise to prepare. On World Health Day this year, we will be looking at ways to ensure that hospitals and health care facilities survive, structurally and functionally, in times of natural disasters and conflict. This is another part of preparedness. Outbreaks, disasters and conflicts remind us of the primary purpose of public health: to protect populations from harm, whether arising from the microbial world, human behaviours or the environment. We do this under the spotlight when an emergency occurs. But we also do this every day in a quieter way that is barely noticed until we fail, for one reason or another, to protect health from harm.”

The DG added, “Let me turn to three items on your agenda that help us operationalize good governance in public health: the Millennium Development Goals, the Commission on Social Determinants of Health, and primary health care. All three uphold the values of equity and social justice. All three aim to prevent avoidable deaths and ill-health through actions in multiple sectors. All three take us back to the basics of public health.

Dr Chan concluded, “You will be considering the proposed programme budget for 2010–2011. You will be doing so at a time described by the experts as the most severe financial crisis and economic downturn seen since the Great Depression that began in 1929. No one wants the current drive to improve

health, both nationally and internationally, to stall or suffer setbacks. But what if the money simply is not there? What happens if the enormous financial bailouts taking place break the bank? How do we decide what to keep and what to cut? Public health always tries to be prepared, to seize every opportunity to prevent and pre-empt. We need some best guesses about the impact of the crisis on health spending. No health minister in any country should be taken by surprise. Above all, we need compelling evidence and arguments to convince ministries of finance and foreign affairs to protect spending on domestic and international health. Let us continue to show other sectors what good governance can mean, especially in times of crisis."

(Excerpted from DG's full report to the Executive Board; Source: WHO/HQ website)

Statement by Dr Samlee Plianbangchang at the 124th Session of the WHO Executive Board

I sincerely thank Members of the Executive Board for appointing me to my second term as Regional Director for South-East Asia. I would like to take this opportunity of extending my sincere gratitude to the Member States in the South-East Asia Region for reposing their confidence in me once again.

I also would like to convey my thanks to the Royal Thai Government for their continued support to my work with the World Health Organization. I am aware of the high expectations of the Member States. And I am also well aware of the heavy responsibilities imposed on me. While pledging to do my utmost to live up to their expectations, I look forward to the continued guidance and support from them. I will need continued advice and direction from the Director-General and I will need continued back-up from all clusters and offices at headquarters and from other WHO regions. Indeed, support from all WHO staff members in the South-East Asia Region is indispensable for me to discharge my duty.

At the beginning of my first term in 2004, among others, I perceived the following major challenges facing countries in the South-East Asia Region:

- Bridging the gaps and reducing inequities in health among population groups;
- Creating conditions that promote sustainable development and self-reliance in health;
- Ensuring availability of basic health services for all, especially the poor and vulnerable population; and
- Placing health at the centre of development through multisectoral efforts and healthy public policies framework.

Several strategies would be needed in addressing these challenges. And I realized that the challenges could also be met effectively by further strengthening WHO collaboration with Member States.

In this connection, I had initiated several measures. Among these were:

- Decentralization of more resources to countries;
- Greater delegation of authority to WHO country representatives;
- Strengthening capacity of WHO country offices through intensive training and coaching of their staff;
- Ensuring efficient back-up support to countries by enhancing capacity of the Regional Office;
- Accelerating efforts on resource mobilization at regional and country levels; and, most importantly,
- Strengthening country capability and capacity through intensified training of a critical mass of national staff in various fields.

I am happy to say that, in close collaboration with our Member States, we have made significant progress in several of the areas mentioned. How successful or how effective we, in WHO, have been, of course, is for the Member States themselves to judge.

As we have seen over the past few years, while we have been able to successfully meet several formidable challenges, the South-East Asia Region continues to carry a disproportionately large burden of diseases.

The Region is also prone to natural disasters of considerable magnitude. The effects of climate change are also being felt on a large scale.

Like the rest of the world, the South-East Asia Region is witnessing an economic downturn. The current financial crisis is bound to have a significant impact on health development efforts in the Region. However, with all our efforts, we should be able to effectively support the Member States in their endeavours to overcome these odds.

As we move into the sixty-first year of WHO's existence in the South-East Asia Region, it is obvious that we have come a long way in our journey towards better health for all peoples. We also realize that there is still a long road ahead. And we realize that one fourth of the world's population who reside in the South-East Asia Region have placed their faith and expectations in WHO. They rely on the Organization to show them the way forward towards a healthier and happier life. This is indeed a very heavy responsibility for the Organization to shoulder.

However, with close collaboration with Member States, and with unstinted cooperation of partners, we will be able to live up to these high expectations. We in WHO will be able to vindicate our role collectively as the promoter of the world's health. Once again, I wholeheartedly thank Members of the Executive Board for the trust they have reposed in me.

WHO guiding principles on organ, tissue and cells transplantation

A regional meeting on WHO Guiding Principles on Organ, Tissue and Cells Transplantation was held in Jaipur, India, from 2-5 February 2009. In his message to the participants, the Regional Director, Dr Samlee

Plianbangchang said, "The medical importance of organ transplantation was recognized during the beginning of the last century when Dr Alexis Carrel was awarded the Nobel Prize in 1912 for his pioneering work. Surgical transplantation of human organs from deceased, as well as living, donors to sick and dying patients began after the Second World War. Over the past 50 years, the transplantation of human organs, tissues and cells has become a worldwide practice which has extended and greatly enhanced the quality of hundreds of thousands of lives. Continuous improvements in medical technology, particularly in relation to organ and tissue rejection, have enhanced the cost-effectiveness and utility of transplantation as an important intervention in fighting chronic disabling or life-threatening diseases."

The Regional Director added, "WHO estimates that globally, about 66 000 kidney transplants take place every year. In addition, 21 000 liver and 6000 heart transplants are undertaken. The estimated numbers of annual kidney transplants in India and Thailand are around 5000 and 300, respectively. These are performed in around 100 centres in India and 30 centres in Thailand. Almost 60% kidney donors in the South-East Asia (SEA) Region are live, unrelated donors. The number of heart and liver transplants in the Region is very small."

The Regional Director concluded, "In recent years, there have been efforts to broaden the scope of ethical analysis in health care to focus more directly on public health issues. Health ethics involves a process of systematic and continuous reflection on the norms and values that guide decisions about health care at the personal, institutional or societal level, and by which the outcomes of such decisions may be judged. Compared to medical ethics that focus on individuals, health ethics also encompasses the full range of health determinants and their interconnections viewed from a societal or systems perspective. The revised WHO Guiding Principles on Organ Transplantation address these issues and provide possible solutions for incorporation by Member countries in their national regulations and practices pertaining to transplantation."



Publications corner

International Pharmacopoeia (The). fourth edition, first supplement

Nonserial Publication; World Health Organization
ISBN-13 9789241547420; ISBN-10 924154742;
Order Number 11501639
Price CHF 70.00 / US\$ 70.00
Developing countries: CHF 49.00

The first supplement adds to and updates the texts of the fourth edition of The International Pharmacopoeia. With publication of this supplement, the fourth edition of The International Pharmacopoeia now comprises the two main volumes published in 2006 and the first supplement.

This supplement is published simultaneously both in print and electronically by means of incorporation into a replacement CD-ROM (and on-line). This provides the user of The International Pharmacopoeia with a choice of form in which to consult the publication depending on the circumstances and the type of enquiry.

WHO classification of tumours of haematopoietic and lymphoid tissues, fourth edition

WHO Classification of Tumours, Volume 2;
IARC WHO Classification of Tumours, No 2; Swerdlow, S.H.,
Campo, E., Harris, N.L., Jaffe, E.S., Pileri, S.A., Stein, H.,
Thiele, J. IARC
ISBN-13 9789283224310; ISBN-10 9283224310;
Order Number 17004002
Price CHF 122.00 / US\$ 122.00;
Developing countries: CHF 85.40

WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues is the

second volume of the Fourth Edition of the WHO series on historical and genetic typing of human tumours. This authoritative, concise reference book provides an international standard for oncologists and pathologists and will serve as an indispensable guide for use in the design of studies monitoring response to therapy and clinical outcome.

Diagnostic criteria, pathological features, and associated genetic alterations are described in a strictly disease-oriented manner. Sections on all recognized neoplasms and their variants include new ICD-O codes, incidence, age and sex distribution, location, clinical signs and symptoms, pathology, genetics and predictive factors.

The book prepared by more than 130 authors from 22 countries, contains about 1000 colour photographs, numerous charts and more than 2500 references.

Building the knowledge base on the social determinants of health

Review of seven countries in the Eastern
Mediterranean Region
WHO Regional Publications, Eastern Mediterranean Series,
No. 31
WHO Regional Office for the Eastern Mediterranean
ISBN-13 9789290216322; ISBN-10 9290216328;
Order Number 14400031;
Price CHF 15.00/US\$ 15.00;
Developing countries: CHF 10.50

The WHO Global Commission on Social Determinants of Health was launched in 2005 with the aim of identifying and tackling the persistent and growing inequalities in health, both within and between countries. These

inequalities are caused by what we now term social determinants, defined as the way people live, work and age in a society. In the Eastern Mediterranean Region the knowledge base on social determinants and how these influence health is sparse. This publication reviews the social determinants of health in seven countries of the Region and represents a first step towards building a knowledge base that can inform policy and strategies related to social determinants and the health inequities arising from them. The publication also discusses some of the strategies that could be adopted to forward the agenda on social determinants of health and health equity in individual countries.

IPCS Mode of Action Framework

IPCS Harmonization Project Document, No. 4
Nonserial Publication; World Health Organization
ISBN-13 9789241563499; ISBN-10 9241563494;
Order Number 11500717
Price CHF 40.00 / US\$ 40.00
Developing countries: CHF 28.00

The use of structured frameworks in chemical risk assessment promotes transparent, harmonized approaches. This book presents two IPCS frameworks originally published in Critical Reviews in Toxicology, in a user-friendly large format. Part 1 contains the IPCS Framework for Analysing the Relevance of a Cancer Mode of Action for Humans, along with three case studies illustrating its application. Part 2 contains the IPCS Framework for Analysing the Relevance of a Non-Cancer Mode of Action for Humans.

The output of a framework analysis is a clear statement of conclusions. The frameworks provide a means of ensuring a transparent evaluation of the data, identification of key data gaps and of information that would be of value in the further risk assessment of the chemical in question.

This book will be useful to risk assessment and regulatory institutions, the chemical industry, as well as to biology and toxicology scientists and researchers.

Anti-tuberculosis drug resistance in the world: fourth global report

The WHO/IUATLD Global Project on Anti-Tuberculosis Drug Resistance Surveillance
Nonserial Publication World Health Organization
ISBN-13 9789241563611; ISBN-10 9241563613;
Order Number 11501613
Price: CHF 30.00 / US\$ 30.00
Developing countries: CHF 21.00

Multidrug-resistant tuberculosis (MDR-TB) has been recorded at the highest rates ever, according to this new report that presents findings from the largest survey to date on the scale of drug resistance in tuberculosis.

This fourth global report is based on information collected between 2002 and 2006 on 90 000 TB patients in 81 countries. It also found that extensively drug-resistant tuberculosis (XDR-TB), a virtually untreatable form of the respiratory disease, has been recorded in 45 countries.

The primary aim of this report is to share survey and surveillance data on drug resistance in TB. The data presented here are supplied largely by programme managers who led the work on surveys.

Operational guidelines for the management of opioid dependence in the South-East Asia Region

SEARO Nonserial Publication, SEARO
ISBN-13 9789290223306; ISBN-10 9290223308;
Order Number 15400003
Price CHF 10.00 / US\$ 10.00;
Developing countries: CHF 7.00

The South-East Asia Region is home to between 3.4 and 5.6 million injecting drug users. A large proportion of them resort to unsafe injecting practices such as sharing of needles and syringes. This has led to the rapid and large-scale transmission of HIV and hepatitis C in this population and their partners.

In order to prevent new infections, countries need to urgently expand the implementation of evidence-based drug treatment interventions. Opioid substitution therapy (OST) is the most useful and cost-effective intervention for managing opioid dependence and reducing the harms associated with it.

OST is now available in India, Thailand, Indonesia and Nepal, and will soon be introduced in the Maldives and Bangladesh. These practical guidelines aim to assist physicians and drug treatment professionals in establishing and delivering evidence-based, good quality, effective OST services in South-East Asia.

Health risks of ozone from long-range transboundary air pollution

EURO Nonserial Publication

Amann, M., Derwent, D., Forsberg, B., Hänninen, O., Hurley, F., Krzyzanowski, M., de Leeuw, F., Liu, S.J., et al.

ISBN-13 9789289042895; ISBN-10 9289071850;

Order Number 13400081

Price CHF 20.00 / US\$ 20.00;

Developing countries: CHF 14.00

Ozone is a highly oxidative compound formed in the lower atmosphere (from gases originating to a large extent from anthropogenic sources) by photochemistry driven by solar radiation. Owing to its highly reactive chemical properties, ozone is harmful to vegetation, materials and human health. In the troposphere, ozone is also an efficient greenhouse gas.

This report summarizes the results of a multidisciplinary analysis to assess the effects of ozone on health. The analysis indicates that ozone pollution affects the health of most of the populations of the WHO European Region, leading to a wide range of health problems. The effects include some 21 000 premature deaths each year in 25 countries in the

European Union on and after days with high ozone levels. Current policies are not sufficient to reduce ozone levels in the Region or their impact in the next decade.

International Health Regulations (2005), second edition

Nonserial Publication;

World Health Organization

ISBN-13 9789241580410; ISBN-10 9241580410;

Order Number 11500725

Price CHF 20.00 / US\$ 20.00;

Developing countries: CHF 14.00

In consideration of the increases in international travel and trade, and emergence and re-emergence of international disease threats and other health risks, the Fifty-eighth World Health Assembly in 2005 adopted the revised International Health Regulations (IHR). The new IHR entered into force on 15 June 2007.

Their stated purpose and scope are "to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade." Because the IHR are not limited to specific diseases, but are applicable to health risks, irrespective of their origin or source, they should remain current with developments in the evolution of diseases and the factors affecting their emergence and transmission. The IHR also require States to strengthen core surveillance and response capacities at the primary, intermediate and national level, as well as at designated international ports, airports and ground crossings. They further introduce a series of new health documents, including ship sanitation certificates and an international certificate of vaccination or prophylaxis for travellers.

Integrating mental health into primary care: a global perspective

Nonserial Publication;
World Health Organization
ISBN-13 9789241563680; ISBN-10 9241563680;
Order Number 11500739
Price CHF 40.00 / US\$ 40.00
Developing countries: CHF 28.00

This report on integrating mental health into primary care, which was developed jointly by the World Health Organization (WHO) and the World Organization of Family Doctors (WONCA), presents the justification and advantages of providing mental health services in primary care. At the same time, it provides advice on how to implement and scale up primary care for mental health, and describes how a range of health systems have successfully undertaken this transformation.

This report is divided into distinct parts, with different needs in mind. Part 1 provides the context for understanding primary care for mental health within the broader health care system. Part 2 explains how to successfully integrate mental health into primary care and highlights 10 common principles that are central to this effort. It also presents 12 detailed case examples to illustrate how a range of health systems have undertaken this transformation. Finally, Annex 1 provides information about the skills and competencies that are required to effectively assess, diagnose, treat, support and refer people with mental disorders.

Calcium and magnesium in drinking water

Nonserial Publication;
World Health Organization
ISBN-13 9789241563550; ISBN-10 9241563559;
Order Number 11500727
Price CHF 40.00 / US\$ 40.00;
Developing countries: CHF 28.00

Can calcium and magnesium ("hardness") in drinking water contribute to preventing disease? This book documents the outputs of an unprecedented group of experts assembled by the World Health Organization to address this question. It includes their comprehensive consensus view on what is known and what is not about the role and possible health benefit of calcium and magnesium in drinking water.

Also included is a series of chapters each authored by internationally renowned experts reviewing the state of the art in different aspects, including global dietary calcium and magnesium intakes; the contribution of drinking water to calcium and magnesium intake; health significance of calcium and magnesium; role of drinking water in relation to bone metabolism; epidemiological studies and the association of cardiovascular disease risks with water hardness and magnesium in particular; and water production, technical issues and economics.



Guidelines for contributors

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

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

Every year, the April issue of the Forum is dedicated to the World Health Day theme of the year. 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@searo.who.int).

Contributions should:

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

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

Responsibility of authors

Authors are responsible for:

- 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/project and contains material/statistics/data derived from government sources;
- ensuring that all abbreviations (if used) are explained;

- giving their full names, the name and address of their institutions, and an exact description of their posts;
- declaring sources of funding for the work undertaken, and
- disclosing at the time of submission, information on financial conflict of interest that may influence the manuscript. They may also choose to declare other interests that could influence the results of the study or the conclusions of the manuscript. Such information will be held in confidence while the paper is under review, and if the article is accepted for publication the editors will usually discuss with the authors the manner in which such information is to be communicated to the reader.

Tables and illustrations

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

References

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

Reprints

Reprints of contributions are not produced but five printed copies of the issue will be supplied to the respective authors. An electronic version of the article in PDF format may also be made available to authors if they provide their e-mail addresses.



How to order WHO Publications

New WHO publications are issued frequently. Requests for information about WHO publications and orders should be addressed to the nearest sales agent (listed below) or to WHO, New Delhi. Orders sent to New Delhi must be accompanied by payment in the form of a demand draft/Indian postal order/money order (prices include handling and postage charges). Orders from countries other than India can be addressed to the sales agent or WHO Representative in that country and are payable in local currency:

INDIA

Eastern India

Hilton and Co.
109 College Street
Kolkata -7000 012, WEST BENGAL
Contact person: Mr Sandip Ghosh
Tel: 033-237-1568
Fax: 033-221-9600
Email: ghoshsandip19@hotmail.com

Mr Sujoy Chandra
Partner
Overseas Publications Service
14 Hare Street, First Floor
Kolkata 700 001, WEST BENGAL
Tel: 033 22484007/22304002
Mobile: 98 300 89367
Email: overseaspub@vsnl.net

Northern India

R.A. Book Agency
4782/23, 1st Floor
Ansari Road, Darya Ganj
New Delhi - 110 002, DELHI
Contact Person: Mr V.P. Sharma,
Mr Ajay Sharma
Tel: 011-23287165, 32581929,
66302136
Fax: 011-23287165
Mobile: 98 101 58917
Email: raba1@sify.com
rabook2@yahoo.co.in

Kamal Academic Book Distributors
Flat no. 118/C, Block – B
Eldeco: Highway Plaza
Rae Bareli Road
Lucknow – 226 025, UTTAR PRADESH
Contact Person: Mr Neeraj Rawat
Mobile: 98 391 37541

Southern India

CAXTON Publications Private Limited
Carmel Centre, Banerji Road
Cochin-682 018, KERALA
Contact Person: Mr Raju J. Anthraper
Tel: 0484-2390409
Fax: 0484-2390785
Email: caxton@vsnl.com
caxton@eth.net

New Century Book House Private Limited.
New Century Buildings
41B, SIDCO Industrial Estate
Ambattur
Chennai-600 098, TAMIL NADU
Phone: 26359906/26247094/26258410
E-mail: ncbhbook@yahoo.com;
ncbhrrk@md4.vsnl.net.in

Western India

K.M. Varghese & Company
Medical Book Distributors & Publishers
104 Hind Rajasthan Building
Dadasaheb Phalke Road, Dadar
Mumbai 400 014, MAHARASHTRA
Contact Person: Mr KM Varghese
Tel: 022-24149074, 4144601
Email: km@varghese.net

Medicca Press
(A Division of Akar Promotion Private Limited)
524, Laxmi Plaza, New Link Road
Andheri (West)
Mumbai – 400 053, MAHARASHTRA
Contact Person: Mr Rahul Jain,
Mr Sunil Shikarkhane
Tel: 022-26374053
Fax: 022-2635 8352
Email: books@mediccapress.in
Website: www.mediccapress.in

BANGLADESH

Ahsania Mission Book Distribution House
House No. 1/A, Road No. 13,
Dhanmondi R.A. (Mirpur Road) 1st Floor,
Dhaka - 1209
Email: dam@drik.bgd.toolnet.org

INDONESIA

C.V. Sagung Seto
Jalan Pramuka No. 27
P.O. Box 4661
Jakarta 10001
Email: sagung82@indosat.net.id

NEPAL

Everest Media International Services (P) Ltd.
GPO Box 5443
Putalisadak Chowk, Dillibazar
Kathmandu
Tel: 977 1 416026
Fax: 977 1 250176
Email: emispltd@wlink.com.np

EKTA Book Distributors Private Limited
Publishers & Distributors
Prashutigraha Marga, Thapathali
GPO 6445, Kathmandu
Contact Person: Mr. R.C. Timothy
Tel: 00 977 1 4260482, 4262091
Fax: 00 977 1 4260744
Email: ektabook@mos.com.np,
ektabook@ntc.net.np
Website: www.ektabook.com

THAILAND

Booknet Company Limited
1173, 1175, 1177, 1179 Srinakharin Road
Suan Luang, Bangkok 10250
Contact Person: Ms. Suphaluck Sattabuz
Tel: (662) 322 3678 Ext. 440
Fax: (662) 721 1639
Email: sup@book.co.th

World Health Organization
Regional Office for South-East Asia
Indraprastha Estate
New Delhi 110 002, India
Attn: Publications (Sales)
Telephone: 2337-0804
Telefax: 2337-9395 / 2337-9507
Email: publications@searo.who.int



**World Health
Organization**

Regional Office for South-East Asia
World Health House
Indraprastha Estate,
Mahatma Gandhi Marg,
New Delhi-110002, India

ISSN 1020423-7

