

Biological, Chemical and Radionuclear (BCR) Emergency Preparedness Strategies

*Report of an Intercountry Meeting,
Bangkok, Thailand 17–20 March 2003*

WHO Project No: ICP EHA 001 RB 02
ICP EHA 031 XD 02



World Health Organization
Regional Office for South-East Asia
New Delhi
June 2003

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1. INTRODUCTION

An Intercountry meeting on Emergency Preparedness Strategies to meet Biological, Chemical and Radionuclear (BCR) threats was organized in Bangkok, Thailand, from 17 to 20 March 2003. The list of countries that participated were: Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor Leste. A list of participants can be seen in Annex 1. The detailed programme conducted can be found at Annex 2.

2. OBJECTIVES

- (1) To review status of emergency preparedness in regional countries particularly for BCR emergencies;
- (2) To apprise participants of existing BCR emergency preparedness programmes at regional and international levels/treaties on BCR emergencies;
- (3) To discuss strategies and elements for strengthening emergency preparedness for BCR emergencies, and
- (4) To prepare draft action plans for action for follow-up activities.

The objective of emergency preparedness is to ensure that appropriate systems, procedures, and resources are in place to provide prompt, effective assistance to the victims, thus facilitating relief measures and rehabilitation services. Emergency preparedness is an ongoing, multisectoral activity that forms an

integral part of the national system responsible for development plans and programmes for disaster management (prevention, mitigation, preparedness, response, rehabilitation, or reconstruction).

The health sector forms an essential part of the intersectoral system for disaster preparedness and response. Its organization and response mechanisms need careful planning, and should take into account the vulnerability of a country or a specific region, health policies and legislation on disasters, and the administrative and technical organization of the health sector's institutions.

The present post-9/11 global scenario demands that all nations be better prepared for deliberate or accidental emergencies, particularly those involving biological, chemical and radionuclear agents.

Responding to these needs, the Regional Office set up a Coordination Committee to address biological, chemical and radionuclear incidents ("BCR Committee"). It meets on a regular basis to review the current status and initiate/propose actions.

Moreover, World Health Assembly Resolution WHA55.16 of 18 August 2002 on "Global public health response to natural occurrence, accidental release or deliberate use of biological and chemical agents or radionuclear materials" that affect health, calls for WHO action in this field.

This intercountry meeting was therefore, organized to assess the present status of preparedness and, through sharing

experiences and information, to augment the existing structure to meet BCR emergencies.

3. PROCEEDINGS

While presiding over the inaugural session, Dr Somsong Rakpoa, Director-General, Department of Medical Sciences, Thailand, highlighted the importance of disasters caused by microorganisms, chemicals and radiation once they get out of hand, even though these have tremendous application in agriculture, industry and health. He appreciated the initiative taken by WHO in organizing a meeting to improve the level of preparedness against BCR emergencies.

The address of the Regional Director was read out which stressed the important role of the health sector in tackling emergencies, both natural and man-made.

Dr G Coleman (National Focus, UK) was elected Chairman and Dr Darika Kingnet (Thailand) as the Vice Chairman. Dr AR Reddy (India) and Dr RL Ichhpujani (India) served as Rapporteurs.

Four presentations were made on behalf of WHO. The first one by Dr Luis Jorge Perez shared how the health sector is important in the intersectoral system for disaster management in general and BCR in particular. WHO and the health ministries of the Member Countries have responsibility for mitigation of the effects of the disaster, medical management and rehabilitation. He recalled that Resolution WHA55.16 directed WHO to provide support for

surveillance, toxicology, laboratory diagnosis, risk communication and the management of psychosocial consequences of disasters.

Dr Ottorinio Cosivi, in his presentation, highlighted the reason for WHO's concern for Biological and Chemical (BC) incidents, and provided information on the WHO strategy and activities to respond to these threats. These are based on (a) an effective global outbreak alert and response operation, which addresses all public health emergencies of international concern – whatever their origin might be: natural, accidental or deliberate; (b) ongoing technical support to Member States' efforts for improving their preparedness and response capabilities; and (c) continued provision of technical and scientific guidance on biological and chemical risks.

Dr Istvan Turai gave a brief account of the activities of REMPAN (Radiation Energy Management Plan and Network) and how it enlarged its scope from the original objectives. REMPAN stood for promotion of radiation emergency medical preparedness, practical assistance and advice in case of exposure to radiation and public health actions. It also brought out fact sheets on various aspects of radiation regularly.

Dr Kersten Gutschmidt spoke on the WHO initiative to meet chemical incidents with an ultimate objective of reducing global burden on disease through prevention, preparedness, surveillance, alert verification, response and follow up.

Mr Claus-Peter Polster gave an account of the objectives and implementation status of the Organization for Prohibition of Chemical Weapons (OPCW). According to him, assistance in terms of protection against chemical weapons is one of the objectives of

this Organization. OPCW can help the Member States if they are threatened by or attacked with chemical weapons.

This was followed by a presentation by Dr Coleman on the role of the WHO Collaborating Centre, Chemical Incidents Management Support Unit, and of the UK National Focus on Chemical Incidents. He advocated for strengthening the existing system rather than creating a new one to meet chemical emergencies. He said that horizontal networking really helps and gave examples from UK. He also recommended that poison control centres (PCC) should be established and/or strengthened to meet chemical emergencies.

Chemical emergencies

Mr Alexander Von Hildebrand elaborated on how accidental and deliberate chemical incidents could be prevented through the sound management of chemicals. He gave statistics on chemical incidents in the Region and emphasized that sound chemical management in the SEA Region is necessary, as this Region consumes a large amount of hazardous chemicals. He advocated for establishing/strengthening national chemicals management profiles by each Member Country as tools to improve emergency preparedness. He also highlighted the role of poison information centres within the context of BCR emergencies, as these centres are the ones that have the needed human resources, like specialized toxicologists.

Dr Rahmat Awang brought out the importance of Poison Control Centres (PCC) and how it helps to provide information about toxicology and antidotes to the public on a 24 hour basis. He cited examples from the Malaysian initiative in this regard.

According to his experience, PCC could play a key role in BCR emergencies.

Dr R V Swamy, in his presentation, explained the elements of first response, physical and medical preparedness against chemical incidents due to accidents and deliberate use of chemical weapons. He mentioned the availability of detection, protection and decontamination equipment that are to be procured by countries of the SEA Region to mitigate/reduce the effect of chemical emergencies.

Biological emergencies

Dr Sudarshan Kumari described some of the important features of biological agents that qualify them as candidate bio-weapons and the possible methods of their dispersion. She also stressed that enhanced epidemiological capability; availability of diagnostic kits with public health agencies and proper communication network are essential to meet biological emergencies.

Dr H V Batra said that the biological emergencies can be of natural origin or by deliberate use. In both cases, the medical community has a great responsibility. At a part of quick response, the determination of etiology of the disease and the populations at risk are to be quickly understood. Training medical professionals to manage such emergencies is important. While personal protection equipment will help the first responders, media should be managed properly to reduce panic and containment of the disease. Otherwise, there will be exodus of people, which leads to spread of the disease. He cited examples from the two plague incidents in India, which contrasted one another in terms of their management.

Long term measures that are essential to meet biological emergencies were explained by Dr Darika Kingset citing examples from Thailand. She pointed out that medical and public health preparedness and bioterrorism preparedness plans were already present in Thailand, which take full care of biological emergencies. These plans are multisectoral. Not only the plan is operated from the Federal Government, but there are agencies in the provinces and at local levels that are prepared for such emergencies. According to the Thailand experience, training, making available drugs and medical supplies, establishment of rapid response teams, proper coordination of different agencies and providing correct and authentic information to the public are the key elements for successful management of biological emergencies.

Dr Sudarshan Kumari said that strengthening national surveillance, dissemination of verified authentic information and helping to stockpile diagnostic reagents and vaccines are supported by WHO to help various countries to diagnose and mitigate the effects of biological emergencies.

Radionuclear emergencies

Dr Reddy and Dr Turai made presentations regarding radionuclear emergencies. Dr Reddy said that the sources of radionuclear emergencies were from industrial and medical use. Radiation injuries may also occur due to theft of radiation sources. He also described well-known accidents that had taken place in the past and said that accidents of nuclear power stations such as Chernobyl, Threemile Island and Windscale were the worst witnessed so far.

Dr Turai described both short-term (deterministic effects) and long-term (deterministic and stochastic effects) results of radiation. These are brought about by changes in DNA molecules and membranes and consequently, information processing of the cell. Thyroid cancer is one of the major problems in such accidents. He also said that while the onset of leukaemia occurs early (< 5 yrs), other types of cancers occur later. Amongst the population, the most affected are the children. According to him, low platelet count, low neutrophil and lymphatic counts are life-threatening conditions and acute radiation injuries call for use of thermography to assess viability of induced skin injuries and early skin grafting. He emphasized that early diagnosis and treatment are essential to save patients from radiation injuries.

In his second presentation on damage prediction and preparedness against radiation exposure, Dr Reddy emphasized the need for radiation monitoring equipment, coordination between agencies such as decontamination, fire-fighters, meteorology and radiation monitoring groups and medical specialists. In such incidents, the most important requirements are identification of contaminated zone and evacuation of people from this zone at the earliest.

Risk communication in BCR emergencies

Dr Bipin Verma spoke on risk communication in BCR emergencies. Since media alters the perception of the public, sound management of media by experts in the field is essential. He advocated for the need for authentic, accurate and timely information, through press releases, press conferences, web pages

and person-to-person interviews. He said communication is key to success of management of BCR emergencies.

4. QUESTIONNAIRE ON BCR EMERGENCIES PREPAREDNESS

A questionnaire on BCR emergencies (see Annex 3) was sent to all SEAR countries well in advance. Questions were divided into general aspects, radiological, chemical and biological emergency preparedness. The countries that responded up to 20 March 2003 were: Bangladesh, Bhutan, India, Indonesia, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste.

Some management plans to take care of the disasters are in place in most of the countries of the SEA Region but BCR related disaster management plan is not generally part of this plan. This means that the magnitude of the effects of BCR emergencies has not yet been understood by the policy-makers of the majority of the Member Countries. Moreover, all disaster plans will only be of practical use if they are backed by funds, without which none of the requirements for meeting the BCR emergencies will be met. Another distressing fact is that even though disaster plans are made, there is no preparedness action plan at the lower administrative level in most of the countries. This means that presently, BCR emergencies are generally being met on *ad hoc* basis only.

Occurrence of BCR emergencies could be reduced through proper legislation to control and regulate activities related to radiation sources, and toxic chemical and pathogenic organisms. A national registry of the existing BCR elements and sources needs

to be prepared and proper precautionary measures taken to safeguard from both accident and theft. Unfortunately, while such regulatory mechanisms generally do exist for chemical and radiological sources, legislation and regulation for biological agents remain inadequate.

Regarding actual preparedness with the right type of hardware (monitoring, detection, protection), some countries possess such equipment, but these are far from adequate. And all countries fail to procure them in sufficient quantities.

Skilled health officials and health infrastructure play key roles for handling BCR emergencies. The responses indicate that though there are hospitals to take care of such patients, the training of physicians to respond to BCR emergencies seems to be inadequate.

There is general awareness amongst the Member Countries of the existence of international agencies that will take care of BCR emergencies. This networking needs to be further strengthened. For the first regional overview of BCR preparedness, see Table below.

*Table: Present Status of BCR Emergency Preparedness in SEAR
(as of 20.03.2003)*

	Topic	BAN	BHU	IND	INO	MMR	NEP	SRL	THA	TLE
General										
1.	National Disaster plan	+	+	+	+	+	-	-	+	+
2.	National BCR Emergency plan	-	-	+	-	+	-	-	±	-
3.	State / District BCR Emergency Plan	-	-	-	-	-	-	-	+	-
4.	Funds for BCR Plan	-	-	-	-	-	-	-	+	-

Topic		BAN	BHU	IND	INO	MMR	NEP	SRL	THA	TLE
Radiation Emergency										
1.	Legislation and Regulation	+	-	+	+	±	±	+	±	-
2.	Training and Education	±	NA	+	+	+	-	±	-	-
3.	Radiation Monitoring Equipment	+	-	+	+	±	-	±	±	-
4.	Protection Equipment	-	-	+	-	±	-	-	-	-
5.	Medical management	-	±	+	+	±	±	-	±	-
6.	Accident Registry	-	NA	-	-	-	-	-	+	-
Chemical Emergency										
1.	Legislation and Regulation	+	-	+	+	+	-	+	+	-
2.	Accident Registry	+	-	+	-	-	-	-	+	-
3.	Chemical Monitoring and detection	-	-	+	-	+	-	-	+	-
4.	Protection	±	-	+	NA	+	+	±	+	±
5.	Medical Management	±	±	+	NA	NA	±	±	+	-
Biological Emergency										
1.	Legislation	-	-	-	-	±	NA	-	±	±
2.	Incidents	+	-	-	-	-	-	-	-	-
3.	Facilities /Equipment	±	-	+	±	±	±	±	±	±
4.	Safety and Security (BSL-3/BSL-4)	-	-	-	-	-	-	-	+	-
5.	International Assistance	±	-	+	+	NA	+	-	-	+

Keys: += Definitely Yes; - = Definitely No; ±= Yes /No; NA= No answer

Note: The answers from MALDIVES were not available

5 RECOMMENDATIONS

5.1 For Member Countries

(1) At policy level

- (1) BCR elements should be incorporated into the existing EHA coordination mechanisms, and shared with WHO.
- (2) Necessary resources should be allocated from the national budget for BCR public health preparedness and response.

(2) At managerial level

- (1) Threat assessment should be adopted as a tool to establish requirements and to prioritize programmes.
- (2) An inventory of all BCR sources/elements and all existing national BCR public health capabilities should be prepared.
- (3) Capacity building of relevant agencies such as poison information centres, and analytical laboratories, should be established, augmented and enhanced.
- (4) Risk communication strategies, particularly for media and the general public, should be addressed.

(3) At operational level

- (1) Ongoing public health surveillance systems should be strengthened.
- (2) Protection for first responders should be established.
- (3) Necessary capacity building for laboratories, isolation units and hospitals should be provided.

5.2 For WHO (and other International Agencies)

- (1) In the changing global scenario, the World Health Assembly should continue to give priority to threat and preparedness for BCR emergencies.
- (2) All WRs should be sensitized and actively involved in BCR-related emergency preparedness and management, and EHA focal points designated in all Member Countries.
- (3) Allocation of special budgets for public health-related BCR development within countries should be considered.
- (4) Augmentation of capacity building for BCR in the regional context (guidelines for implementation, and evaluation of national BCR programmes, training, research, logistical advice) should be continued.
- (5) Advocacy with the political leaders, policy-makers and parliamentarians should be continued.
- (6) Regional and international networks with special emphasis on laboratory services, exchange of information and expertise should be facilitated.
- (7) Simplification of the process to enable rapid access to available resources should be undertaken.
- (8) Intercountry meetings on BCR emergencies should be organized at regular intervals.

6. ACKNOWLEDGEMENTS

We acknowledge with gratitude the financial support received from the Department for International Development (DFID), UK, and the Swiss Humanitarian Aid, Federal Swiss Agency for Development and Cooperation, Department of Foreign Affairs, Switzerland, for this meeting. We also wish to thank the Ministry of Public Health, Thailand, and all those who participated and contributed with their expertise.

Annex 1

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Annex 2

PROGRAMME

Monday, 17 March 2003

1700 – 1730 hrs	Registration	
1730 – 1830 hrs	Opening session	
	Presided by Dr Bjorn Melgaard, WHO Representative to Thailand, and Dr Somsong Rakpoa, Director-General, Department of Medical Sciences, Thailand	
	Welcome Address by the Director-General, DMSc	Dr Somsong Rakpoa
	Introduction of participants	Dr Bjorn Melgaard
	Nomination of Chairman and Rapporteur	Dr Luis Jorge Perez

Tuesday, 18 March 2003

0830 – 0840 hrs	Objectives and process of the meeting	Dr Luis Jorge Perez
0840 – 0910 hrs	Role of health sector in planning for emergency preparedness for biological, chemical and radionuclear (BCR) incidents	Dr Luis Jorge Perez
0910 – 0940 hrs	Global aspects between EHA and biological incidents	Dr Ottorinio Cosivi
1000 – 1030 hrs	Current RAD-REMPAN/WHO activities related to medical preparedness and response to radiation emergencies	Dr Istvan Turai
1030 – 1100 hrs	OPCW activities concerning emergency preparedness	Dr Claus-Peter

	against chemical weapons incidents	Polster
1100 - 1115 hrs	Global aspects of chemical incidents	Prof Gary Coleman
1115 - 1315 hrs	Regional scenario based on responses to questionnaires received from countries	Dr R V Swamy

1415 – 1445 hrs	Public health role in chemical incidents and emergencies – the global WHO agenda	Dr Kersten Gutschmidt
1445 – 1545 hrs	Origin of chemical incidents – industrial and deliberate (case studies)	Dr Alexander V Hildebrand
1600 – 1645 hrs	Preparedness against chemical incidents (first response, medical and physical preparedness)	Dr R V Swamy
1645 – 1715 hrs	Role of poison information centres in BCR emergencies	Dr Rahmat Awang

Wednesday, 19 March 2003

0830 – 0845 hrs	Wrap up from the previous day	
0845 – 0915 hrs	Types of biological agents and the origin of biological incidents	Dr Sudarshan Kumari
0915 – 0945 hrs	Quick response and containment measures against biological incidents	Dr H V Batra
0945 – 1030 hrs	Long-term measures to prevent biological incidents	Dr Darika Kingnet
1045 – 1115 hrs	Regional initiatives by WHO on biological emergency preparedness undertaken/proposed	Dr Sudarshan Kumari
1115 – 1145 hrs	Characteristics of radionuclear emergency and the circumstances under which	Dr A R Reddy

such emergencies occur

1145 - 1215 hrs	Short-term and long-term effects of radiation exposure and lessons to be learnt from medical management of recent radiation accidents	Dr Istvan Turai
1215 - 1245 hrs	Damage prediction and preparedness against radiation exposure	Dr A R Reddy
1245 - 1315 hrs	Questions	
1415 - 1445 hrs	Role and support by IFRC and National Red Cross Societies on BCR management	Mrs Grete Budsted
1445 - 1515 hrs	Importance of risk communication in an emergency situation with to BCR incidents	Dr B.K. Verma
1515 - 1700 hrs	Working group (WG-1) to deliberate on priority needs	

Thursday, 20 March 2003

0830 - 0900 hrs	Wrap up from the previous day
0900 - 1000 hrs	Plenary discussion on WG-1 deliberations
1000 - 1030 hrs	Briefing to develop country specific PoA for BCR emergencies preparedness
1045 - 1300 hrs	Working group (WG-2) to develop country specific PoA

1400 - 1500 hrs	Plenary discussions on WG-2 deliberations	
1515 - 1630 hrs	Final recommendations	Dr Luis Jorge Perez
1630 - 1700 hrs	Closing session	

Annex 3

QUESTIONNAIRE

Part I: GENERAL

1. Is there a national disaster/emergency management plan in your country? Yes No

2. Are biological, chemical and radiation (BCR) emergencies part of this plan? Yes No

3. Which of the control agencies/ministries/departments primarily associated with related emergencies?
 - (a.) Radiation
 (i)
 (ii)
 (iii)

 - (b.) Biological
 (i)
 (ii)
 (iii)

 - (c.) Chemical
 (i)
 (ii)
 (iii)

.....

- | | | | |
|----|---|-----|----|
| 4. | Is there a state/provincial plan to meet BCR emergencies? | Yes | No |
| 5. | If so what is the structure of this plan for operation/execution indicating responsibility of each level? | | |
| 6. | Is there a district/local level emergency plan that includes BCR emergencies? | Yes | No |
| 7. | If yes, describe the structure of this plan and the responsibility of officials/individuals/groups. | | |
| 8. | Is your civil defence agency equipped to handle BCR emergencies? | Yes | No |
| 9. | Is there a plan to meet BCR emergencies in the future in respect of | | |
| | (1) Awareness creation amongst: | | |
| | (a) Students | Yes | No |
| | (b) Professionals | Yes | No |
| | (c) Police | Yes | No |
| | (d) Public | Yes | No |
| | (e) Others (specify) | Yes | No |
| | (2) Preparedness | | |
| | (a) Recognition and identification | Yes | No |
| | (b) First response | Yes | No |

	(c) Contamination control	Yes	No
	(d) Medical treatment`	Yes	No
	(e) Health monitoring	Yes	No
	(f) Command, control and (inter-agency) communication	Yes	No
10	Are there separate allocation of funds to meet BCR emergencies?	Yes	No

PART II: RADIATION EMERGENCIES

I Legislation and regulation

1.	Does a statutory regulatory body exist under Govt act in your country (as recommended by the IAEA)	Yes	No
2.	Is your country a party to international conventions on early notification, mutual assistance and radiological safety?	Yes	No
3.	(a) Have your nuclear power plant(s) nuclear reactors and other radiological sites “on-site” and “off-site” emergency preparedness plan?	Yes	No
	(b) Are the above within the “No fly zone”?	Yes	No
4.	Are Basic Safety Standards published by International agencies FAO/IAEA/OECD/NEA/PAHO/WHO in 1996 being followed in your country?	Yes	No
5.	Is your country a signatory to IAEA/Comprehensive Test Ban Nuclear Weapons and Non-proliferation Treaty?	Yes	No
6.	Is there a legislation in your country that controls the use, production and possession of radioactive	Yes	No

- material?
- | | | | |
|----|--|-----|----|
| 7. | Is there a controlling agency for production, storage and use of radioactive materials in your country? | Yes | No |
| 8. | Is it obligatory to obtain a license for use of radioactive materials and sources of ionizing radiation in your country? | Yes | No |
| 9. | (a) Has there been any notified theft of radioactive material from your country in the last five yrs. | Yes | No |
| | (b) If yes, provide details. | Yes | No |
10. What kind of mechanism is observed to safeguard radiation sources (eg Co⁶⁰) used in hospitals?

II Training and education

1. At what level is "Philosophy of radiation emergency and protection" a part of education in your country?
- School
 - College
 - University
 - Professional courses
- | | | | |
|----|---|-----|----|
| 2. | Are there trained officials as "first responders" for radiation emergencies? | Yes | No |
| 3. | Is there a training programme in your country for safe use of radioactivity? | Yes | No |
| 4. | Is there a sufficient number of medical/paramedical professionals trained for medical response to radiation | Yes | No |

emergencies?

III. Radiation monitoring and detection

- | | | | |
|----|---|-----|----|
| 1. | Is there a national environmental radiation monitoring system to detect ionizing radiation? | Yes | No |
| 2. | Are these instruments at different locations to monitor radiation levels and to notify and consult with central monitoring stations for emergency response? | Yes | No |
| 3. | What are the types and measurement ranges of radiation monitoring equipment available in your country? | | |
| 4. | Is there a system for regular monitoring and recording the occupational radiation doses received by workers in nuclear power plants, hospitals etc.? | Yes | No |
| 5 | (a) Are there mobile radiation monitoring laboratories (mobile vans), and mobile whole body counters in use in your country? | Yes | No |
| | (b) If yes, how many (by each type)? | | |
| 6. | Is there an "in situ" facility to monitor and identify radioactivity in a contaminated area? | Yes | No |
| 7. | Are there adequate facilities for measuring and identifying radioactivity in various food stuff, milk and drinking water samples? | Yes | No |

IV Radiation-related accident status

- | | | | |
|----|--|-----|----|
| 1. | Was there any accident involving radioactivity or radiation generating sources in your country in the last | Yes | No |
|----|--|-----|----|

10 years, with loss of life?

2. If yes, give details of the accident and its management.

V National level plans

- | | | | |
|----|--|-----|----|
| 1. | (a) Do you have a “national radiological emergency management plan?” | Yes | No |
| | (b) If yes, which national authority bears the primary responsibility in its maintenance and update? | Yes | No |
| | (c If yes, are there regular exercises to keep your national system in “readiness”? How often do you conduct drills in a year? | | |
| 2. | Do you use the International Nuclear Event Scale (INES) to indicate the severity of nuclear and radiological events in | Yes | No |
| | (a) Reactors | | |
| | (b) Fuel processing plants | | |
| | (c) Irradiators | | |
| | (d) Radiotherapy units | | |

VI Radiation protection

- | | | | |
|----|--|-----|----|
| 1. | Are there basic/essential facilities for individual and collective protection (eg. respirators and shelter,) of exposed members of the population in your country? | Yes | No |
| 2. | Is the International Basic Safety Standard for protection against ionizing radiation followed? | Yes | No |
| 3. | Are adequate sheltering and temporary evacuation facilities available in the case of a nuclear emergency? | Yes | No |

- | | | | |
|----|---|-----|----|
| 4. | Is the country equipped with protective clothing masks, gloves, shoes, bags etc for radiation workers and rescue workers? | Yes | No |
|----|---|-----|----|

VII Documentation and decorporation

- | | | | |
|----|---|-----|----|
| 1. | Is a "standard operating procedure" SOP available for decontamination and decorporation? | Yes | No |
| 2. | Are facilities available for the decontamination of (a) personnel and (b) materials (including vehicles, radiation monitoring devices, other equipment, etc)? | Yes | No |
| 3. | Are there facilities for detection and measurement of radioactivity intake by human being (ingested or inhaled radio nuclides)? | Yes | No |
| 4. | Are national/state warehouses/storage facilities for substances used in decontamination and decorporation? | Yes | No |
| 5. | Are some of the following décorporating agents approved for human use always readily available? | Yes | No |
| | (a) Prussian blue (Ferric ferrocyanide) | | |
| | (b) Potassium iodide/Iodate | | |
| | (c) Barium sulphate | | |
| | (d) Magnesium sulphate | | |
| | (e) Aluminium phosphate | | |
| | (f) Isotonic sodium bicarbonate DTPA | | |
| | (g) EDTA | | |
| 6. | Are adequate quantities of following external decontaminating agents readily available? | Yes | No |
| | (a) Water (lukewarm) | | |

- (b) Soaps detergent
- (c) EDTA
- (d) Potassium permanganate

VIII Medical management

- | | | | |
|----|---|-----|----|
| 1. | Do you relate with the “Radiation Emergency Medical Preparedness and Assistance Network” (REMPAN) Collaborating Centre?(if it exists in your country) | Yes | No |
| 2. | Are there specialized medical centres for bone marrow transplantation in your country? If yes, how many? | Yes | No |
| 3. | Is the following trained manpower available at the above centres: | Yes | No |
| | (a) Medical doctors | | |
| | (b) Medical laboratory technicians | | |
| | (c) Radiation medicine specialists | | |
| | (d) Haematologists | | |
| | (e) Burn specialists | | |
| | (f) Organ transplant (bone marrow, skin) specialists | | |
| | (g) Cytogenetists | | |
| 4. | How many facilities for large scale blood analysis are there in your country? | | |
| 5. | Are the hospitals well equipped with handling large number of patients with vomiting and diarrhoea following accidental radiation exposure? | Yes | No |
| 6. | Are facilities for biological dosimetry (chromosomal aberration, micronuclei and other mutation assays, etc) available? | Yes | No |

7. Are the specialized medical centres equipped with decontamination and isolation facilities to safely handle subjects contaminated with radioactive materials? Yes No
8. (a) Are “mobile clinics with basic facilities to handle radiation emergencies” available? Yes No
- (b) If yes, how many and how are they distributed in your country?
- (c) Can they be easily mobilized? How?
9. Are there specialized hospitals equipped with facilities for long-term follow up including monitoring for cancer and genetic defects? Yes No
- IX. Resources**
1. Is there a specified allocation of budget for meeting expenditure towards “radiation emergency” and preparedness? Yes No
2. Is there “national level/state level” public relation centres for dissipating knowledge pertaining to radiological and nuclear emergencies? Yes No
- X. International involvement**
- Are you aware of how to contact international agencies in case of “radiation emergency” IAEA and WHO? No Yes

PART III: CHEMICAL EMERGENCIES

I Legislation and regulation

- | | | | |
|----|--|-----|----|
| 1. | Does your country have a National Chemical Profile?
If yes, who is coordinating it? | Yes | No |
| 2. | Do you have any legislation to supervise/control/regulate transportation of hazardous chemicals on the following: | | |
| | ➤ Importation of hazardous chemicals | Yes | No |
| | ➤ Transportation of hazardous chemicals | Yes | No |
| | ➤ Storage of hazardous chemicals | Yes | No |
| | ➤ Processing of hazardous chemicals? | Yes | No |
| 3. | Do you have a list of hazardous chemicals that is included in the above legislation?
If yes, how are they classified? (fire prone, explosive or toxic chemical, other?) | Yes | No |
| 4. | Do you have a list of chemical industries that are regulated for safety of handling hazardous chemicals? | Yes | No |
| 5. | Do you have legislation that stipulates off-site and on-site emergency plans for industries handling hazardous chemicals? | Yes | No |
| 6. | Is your country a member of the Chemical Weapons Convention? If yes, date of signature and date of ratification | Yes | No |
| 7. | Is there a national legislation that prohibits any individual or group of individuals possessing CW agents or similar weapons? | Yes | No |

8. Has there been any notified theft of hazardous chemicals in the last ten years? If yes, provide details thereof. Yes No

II Chemical accident status

1. Which have been the major chemical incidents that occurred in chemical factories or in any other setting, where human loss was more than 10 per accident, in the last 10 yrs. Provide details thereof
2. Give details of the agencies that took part in the management of such major accidents and the method by which they accomplished the task.

III Training and education

1. Are there trained officials as first responders for meeting with chemical emergencies? Yes No
2. How many medical/paramedical professionals trained in chemical emergencies
3. How many regular drills of such emergency training are conducted?

IV Chemical monitoring and detection

1. Are there instruments available to detect/monitor highly toxic agents (see below) in a short span of time (1-2 min) Yes No
If yes, please specify level of detection.



Nerve agents

ppm

Blister agents

ppm

Blood agents

ppm

Lung injurants

ppm

Toxins

ppm

2. Is there a facility/equipment to identify the above toxic agents on ground? Yes No

3. Are there stationary monitoring equipments in crowded public places (railway stations, airport, shopping mall etc) that respond to toxic chemicals agents spill or dissemination? Yes No

4. Are there facilities to identify and measure toxic chemical agents in foodstuffs or drinking water? Yes No

V Protection against chemical agents

1. Have threat assessments been conducted determining the likelihood of a chemical incident? Yes No

If yes, please provide details.

2. Have vulnerability assessments been conducted determining the likelihood of a chemical incident? Yes No

If yes, please provide details.

3. Have risk assessments been conducted determining the likelihood of a chemical incident? Yes No

If yes, please provide details.

4. Do you have the following type of protective equipment to give to first responders? If so, in what numbers?

Numbers

Gas mask/Respirator Yes No

Canister Yes No

Full protective Suits Yes No
Boots Yes No
Gloves Yes No

5. Are adequate sheltering and temporary evacuation facilities available during chemical emergency? Yes No

6. At what level individual protection and sheltering facilities available? National State District

7. Do you have the following equipment/stores for decontamination of chemical agents? Yes No

Decontamination agents Yes No
Decontamination equipment Yes No
Decontamination vehicle Yes No
Decontamination suit Yes No

8. How will contaminated waste be managed?

VI Medical management

1. Are there specialized centres for treating toxic chemical/poison emergency cases? Yes No

If yes, details thereof.

2. Is the following trained manpower available at these centres?

(a) Medical doctors Yes No

- | | | |
|-----------------------------|-----|----|
| (b) Toxicologists | Yes | No |
| (c) Medical lab technicians | Yes | No |
| (d) Paramedics | Yes | No |
3. Are the following antidotes stocked in these centres?
- | | | |
|--------------------------------|-----|----|
| Antidotes for nerve agents | Yes | No |
| Antidotes for cyanides | Yes | No |
| Antidotes for others (specify) | Yes | No |
4. How many centres/hospitals are well equipped to handle chemical emergencies? At what location
- National level, n:
- State level, n:
- District level, n:
- Sub District level, n:
5. (a) Are there mobile clinics to handle chemical emergency cases? Yes No
- (b) If yes, how many?
6. (a) Are there poison control centres? Yes No

(b) If so, details thereof.

PART-IV: BIOLOGICAL EMERGENCIES

I. Legislation

- | | | | |
|----|---|-----|----|
| 1. | Do you have any regulation to supervise/control/regulate/transfer of hazardous organisms? | Yes | No |
| 2. | Do you have a list of hazardous organisms that are included in the above legislation? | Yes | No |
| | If so, have they been categorized according to their risk group classification? | Yes | No |
| 3. | Do you have any legislation that regulates manipulation of gene in plants, animals, bacteria, insects, virus, fungi, yeast etc? | Yes | No |
| 4. | Is your country a member of the Biological and Toxin Weapon Convention? | Yes | No |
| 5. | Do you have any legislation in your country that prohibits dealing with biological weapon grade material? | Yes | No |
| 6. | Has there been any notified theft/unaccountable loss of hazardous organisms? | Yes | No |
| | If yes, details thereof. | | |

II. Biological incident status

- | | | | |
|----|---|-----|----|
| 1. | Were there any major epidemics in your country that were suspected to be not due to natural causes? | Yes | No |
| | If yes, details thereof. | | |

2. Indicate the agencies that took part in the management of such epidemics.

III. Training and education

Are there trained officials as first responders for meeting biological emergencies? Yes No

IV. Facilities/Equipment to meet biological emergencies

1. Do you have well structured communication mechanism to disseminate correct and authentic information to public in case of biological emergency? Yes No

2. Do you have quarantine facility to isolate infected persons from abroad? Yes No

3. Do you have disinfective and decontamination equipment and methodologies against biological agents? Yes No

4. Do you have protective equipment for the first responders and health care workers? Yes No

- (a) personal protection suit
- (b) respirator
- (c) prophylaxis

V. Safety and security of biological agents

1. Do you have BSL-3 or BSL-4 facilities to handles hazardous micro organisms? Yes No

2. If yes, the number BSL-4

3. What is the method of storage of these organisms?

4. What security arrangements are put in place to ensure safety of these organisms?
5. Did you import any risk III/risk IV agents from abroad in the last five years? If yes, details thereof. Yes No

VI. International arrangements

1. Did you in the last five years, ask for help from international organizations like WHO or any Government for help in diagnosis/ management/investigation of any epidemic? Yes No
2. Did your physician/scientists get trained in any of such organization for management of such epidemics? Yes No

VII. Disease-Specific questions		Biological Emergencies								
		Plague	Anthrax	Smallpox	Dengue	Other haemorrhagic fever	J. encephalitis	Viral Hepatitis	Undiagnosed fever with high mortality	Yellow Fever
1.	Was there an occurrence of human case of the mentioned diseases?									
2.	If yes, the approximate number of human cases in the last five yrs?									
3.	Is there a surveillance system in existence for reporting of the diseases mentioned here?									
4.	Do you have vaccines against the diseases mentioned here?									
5.	Do you have any prophylaxis available for the diseases mentioned here									
6.	Do you have diagnostic facilities for the diseases mentioned here Presumptive – Confirmative –									
7.	Do you have drugs available for the treatment of the diseases mentioned here?									
8.	Do you have adequate hospital beds to take care of the patients suffering from the diseases mentioned here?									

9.	Do you have professionals trained in the diseases mentioned here? a. Clinician b. Epidemiologist c. Bacteriologist / virologist									
10.	Do you have isolation and identification facilities for the causative organisms of these diseases mentioned here?									