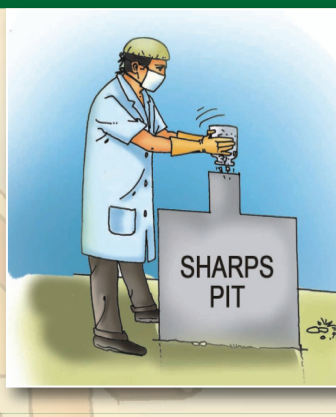
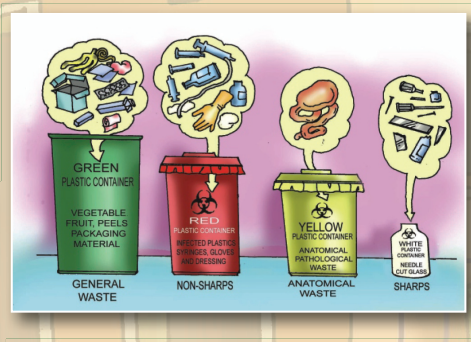
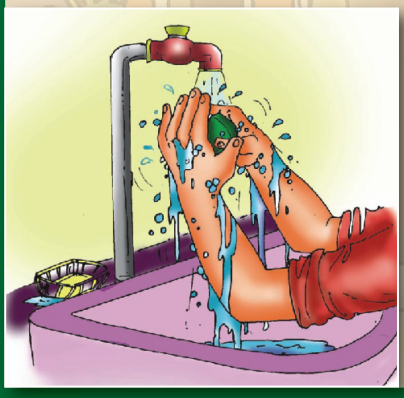
NATIONAL RURAL HEALTH MISSION
राष्ट्रीय ग्रामीण स्वास्थ्य मिशन
(2005-2012)

INFECTION MANAGEMENT AND ENVIRONMENT PLAN

Policy Framework
March 2007







सत्यमेव जयते

Ministry of Health & Family Welfare
Government of India

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DFID Department for International Development

The World Bank

Preface

Bio-medical waste refers to all wastes generated from healthcare and health research facilities and associated laboratories. While most of this is communal waste, a small percentage can be deemed infectious and/or hazardous. These include infected sharps and wastes with infectious, hazardous, radioactive, or genotoxic characteristics, which if inadequately treated and managed can have adverse impact on the environment and on public health through air, land and water pollution. Therefore institutionalizing effective waste management systems in all healthcare facilities is a key prerequisite to improving efficiency and effectiveness of healthcare.

The regulatory framework for environmental management in the health sector in India is provided by the Bio-Medical Rules (prepared in 1998; amended in 2000 and 2003), which apply to all persons/ institutions generating and/or handling healthcare waste in any form. The Rules define bio-medical waste as "any waste which is generated during diagnosis, treatment or immunization of human beings or animals, or in research activities or in the production or testing of biological and including categories mentioned in schedule-I of the rules". The Rules, besides identifying the various waste categories, also recommend treatment and disposal methods and the standards to be laid down for the same.

The Ministry of Health & Family Welfare commissioned the development of a National Policy document to address the issues relating to infection control and waste management and define a framework for implementation of an Infection Management and Environment Plan (IMEP) in healthcare facilities. This policy document was commissioned under the Reproductive and Child Health Programme Phase - II, with technical and financial support from DFID and the World Bank.

The final IMEP document comprises of **2 volumes:**

- A **Policy Framework document** which gives a broad overview and contains generic guidance to central and state level institutions on the type of systems and processes to be established for infection control and bio-medical waste management.
- A set of **Operational Guidelines** which are designed as instruction manuals for healthcare workers at primary level healthcare facilities, i.e. Community Health Centres, Primary Health Centres and Sub Centres. These guidelines are in the form of simple pictorial presentations of the various steps needed to manage infectious waste in a hygienic, safe and environmentally sound manner.

The IMEP Guidelines will be implemented and monitored under the auspices of the National Rural Health Mission (NRHM) and will go a long way to internalise state–of–the art, best practices in managing health and environment risks in the healthcare institutions of our country.

Date: 1st April, 2007

(Naresh Dayal)
Secretary (Health and Family Welfare)
Ministry of Health and Family Welfare
Government of India

Acknowledgement

The Infection Management and Environment Plan document is an important component of the support to primary level healthcare being provided under the auspices of the National Rural Health Mission (NRHM) and Reproductive and Child Health Programme Phase - II. The Policy Framework document and the Operational Guidelines are intended to facilitate and enhance implementation of the Bio-Medical Waste Management Rules of the Government of India.

The vision and constant encouragement provided by Shri P.K. Hota, former Secretary, Health and Family Welfare enabled us to bring out these guidelines. I express my sincere thanks to Shri Naresh Dayal, Secretary, Health & Family Welfare under whose leadership these guidelines have been finalized.

Special thanks are also due to Ms. Ruma Tavorath, Environment Specialist, The World Bank, for her technical contribution and continued guidance to bring the document to its current shape. We are particularly thankful to Dr. Sean Doolan, Environment Adviser, DFID who conceptualized this document and to Mr. Stephen Young, Senior Infrastructure and Urban Development Adviser, DFID for the continued support. Ms. Ellora Guhathakurta, Programme officer, DFID deserves special mention for her meticulous and sustained follow-up and coordination throughout the administrative process.

I recognize the excellent contributions of Mr. S. Vaideeswaran, Consultant, The World Bank and Dr. Megha Rathi, Consultant, DFID in successfully translating the concepts of the Policy Framework and Operational Guidelines into reality. Sincere appreciation is due to Shri S.S. Brar, Joint Secretary (RCH) and Shri A.P. Singh, Director (DC) for their leadership, encouragement and guidance.

I acknowledge the contributions of Dr. V.K. Manchanda, erstwhile Deputy Commissioner (MCH), Dr. Narika Namshum, Deputy Commissioner (Child Health and Training), Dr. I.P. Kaur, Deputy Commissioner (Maternal Health) and Dr. Himanshu Bhushan, Assistant Commissioner (Maternal Health).

I would like to make a special mention of Dr. Manisha Malhotra, Assistant Commissioner, Maternal Health Division, for her unstinting support and unwavering commitment to finalizing, disseminating and enhancing the importance of this activity within the NRHM agenda.

The cooperation and technical inputs provided to this activity by the members of the "Working Group" deserves special mention. So does the contribution of the secretarial staff from the various organizations who have facilitated us in this important activity.

Date: 1st April, 2007

(S. Jalaja)
Additional Secretary
Mission Director, NRHM
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Government of India

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List of Abbreviations and Acronyms

AD	Auto-Disable
ANM	Auxiliary Nurse Midwife
AYUSH	Department of Ayurveda, Yoga, Unani, Siddha & Homeopathy
BCC	Behaviour Change Communication
CDC	Centre for Disease Control Prevention
CHC	Community Health Centre
CPCB	Central Pollution Control Board
CWTF	Common Bio-Medical Waste Treatment Facilities
SPIP	State Programme Implementation Plan
DFID	Department for International Development, Government of UK
DoHFW	Department of Health & Family Welfare
DPIP	District Programme Implementation Plan
EA	Environmental Assessment
EAG	Empowered Action Group
EIA	Environmental Impact Assessment
FW	Family Welfare
GDP	Gross Domestic Product
GoI	Government of India
HCWM	Health Care Waste Management
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
IEC	Information, Education & Communication
IMEP	Infection Management and Environment Plan
IV	Intra-Veinous
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MIS	Management Information Systems
MOEF	Ministry of Environment & Forests
MOHFW	Ministry of Health & Family Welfare
NGO	Non-Governmental Organisation
NPIP	National Programme Implementation Plan
NRHM	National Rural Health Mission
PHC	Primary Health Centre
PIP	Programme Implementation Plan
RCH - II	Reproductive and Child Health Programme, Phase II
Rs.	Rupees
SA	Social Assessment
SC	Sub-Centre
SPCB	State Pollution Control Board
SPIP	State Programme Implementation Plan
SWAP	Sector Wide Approach
UIP	Universal Immunisation Programme
UN	United Nations
UNICEF	United Nations International Children Education Fund
USAID	United States Agency for International Development
WHO	World Health Organisation
WB	World Bank

1

Introduction

1.1 Background

1.1.1 NRHM

National Rural Health Mission (NRHM) provides the framework for implementation of primary level healthcare services by the Ministry of Health and Family Welfare (MoHFW) for the period, 2005-2012. NRHM is the response to the urgent need to transform the Indian Public Health System into an accountable, accessible and affordable system that provides quality services to its users. The vision of the mission includes:

- To provide effective healthcare to rural population throughout the country with special focus on 18 states, which have weak public health indicators and/or weak infrastructure.
- 18 special focus states are Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Jammu and Kashmir, Manipur, Mizoram, Meghalaya, Madhya Pradesh, Nagaland, Orissa, Rajasthan, Sikkim, Tripura, Uttaranchal and Uttar Pradesh.
- To raise public spending on health from 0.9% GDP to 2-3% of GDP, with improved arrangement for community financing and risk pooling.
- To undertake architectural correction of the health system to enable it to effectively handle increased allocations and promote policies that strengthen public health management and service delivery in the country.
- To revitalize local health traditions and mainstream AYUSH into the public health system.
- Effective integration of health concerns through decentralized management at district, with determinants of health like sanitation and hygiene, nutrition, safe drinking water, gender and social concerns.
- Address inter-state and inter-district disparities.
- Time-bound goals and report publicly on progress.
- To improve access to rural people, especially poor women and children to equitable, affordable, accountable and effective primary healthcare.
- To ensure the safety of the patient and of the healthcare worker.

In working towards the various goals outlined in its vision, the MoHFW will face a number of issues and challenges.

1.1.2 Issues and Challenges

The major issues and challenges relevant to health and environmental risks in healthcare facilities are as follows:

- Treatment and disposal of bio-medical waste: Currently many healthcare facilities are not managing their infectious waste in accordance with the Bio-Medical Rules promulgated by the Government of India. The challenge is to get all levels of healthcare facilities to institutionalise proper infection control measures and sound treatment and disposal of bio-medical wastes.
- Disposal of sharps: Disposal of sharps is a big issue in the rural areas and at primary healthcare facilities. Studies revealed that a very large proportion of injections administered in country are unsafe, and syringe disposal techniques are faulty throughout the country. Institutionalising good practices in this regard is one of the challenges.
- Auto Disable (AD) plastic syringe wastes: Under the RCH-II programme, the GoI has taken a decision for using AD syringes for routine immunisation. There is expected to be a large quantity of plastic waste that will need to be disposed off in an environmentally sound manner. Proper treatment and disposal of these wastes will be another challenge.
- Water and sanitation: In primary level health facilities, provision of clean, potable and continuous water supply is a documented issue. Associated with it, the treatment and disposal of waste water and sewage and continued operation and maintenance systems needs to be addressed.
- Design and construction-related issues: Under NRHM, there are expected to be a range of new constructions, such as sub-centres, operation theatres, labour rooms, new-born care corners and blood storage facilities. Many diesel generation sets will be installed. All these will require proper designing and will also result in the generation of construction waste, which needs to be disposed in an environmentally responsible manner.
- Information, skill and attitude: Lack of information, awareness and skills is one of the primary factors for poor implementation of infection control and bio-medical waste management. The challenge is to provide healthcare workers with skills training, protective equipment and appropriate tools to bring about a fundamental shift in their mindset and behavioural patterns.

At an institutional level, the major challenge is that different programmes within the MoHFW tend to be implemented in silos. There is inadequate coordination of capacity building programmes and IEC and awareness activities resulting in duplication of activities and equipment. The other main issue is that of inadequate enforcement and non-compliance of the Bio-Medical Waste Management Rules.

1.1.3 Bio-medical Wastes

Wastes generated in healthcare facilities include different kinds of infectious and non-infectious waste. The latter tends to be of smaller volumes than non-infectious waste, but

once mixed the total "unsegregated" waste is deemed as infectious. Table 1.1 gives the breakdown of the type and quantity of wastes generated in a typical 30-bedded CHC.

Table 1.1 Type & Quantity of Waste in a 30-bedded CHC

No.	Waste type	Quantity (Kg/day)	Percentage of each type of waste (%)
A.	Infectious waste		
A1	Pathological and anatomical	1.5	6
A2	Sharps including syringes	1.0	4
A3	Non-sharps waste	7.5	30
	Total:	10.0	40
B.	General waste		
	Total:	15.0	60
	Grand Total:	**25.0**	

It is important to keep in mind that, if the infectious wastes are not separated from the common waste, the complete waste volume would need to be considered infectious. For this reason, WHO recommends that the daily amount of bio-medical wastes in health care facilities without a proper waste management system be calculated using the estimate of 1kg/bed.

1.2 Purpose of Infection Management and Environment Plan (IMEP)

The Infection Management and Environment Plan (IMEP) is an approach or framework for managing – avoiding, reducing and controlling – health and environmental risks arising from healthcare facilities.

Health and environmental risks arise out of poor infection control practices and unsound environment management systems such as (i) inappropriate disinfection, (ii) poor sterilisation techniques, (iii) inadequate use of protective gears, (iv) poor bio-medical waste handling, treatment and disposal practices, (v) unhygienic and unsanitary conditions and inadequate potable water within the healthcare facilities.

Through a structured and systematic approach, the IMEP aims to bring in state-of-the-art, best practices in managing these health and environmental risks effectively. It comprises two volumes –

- Policy Framework: A summary version that gives a broad overview and generic guidance to central and state level institutions on the establishment of a system for sound infection control and bio-medical waste management.
- Operational Guidelines: Designed as an instruction manual for healthcare workers at PHC, CHCs and SCs and provides details of the procedures, plans and guidelines of infection control and waste management procedures.

While the Policy Framework is targeted to senior management, the Operational Guidelines are mainly for doctors, nurses and various levels of healthcare workers. Hence, the range of the IMEP covers the entire chain of stakeholders in the healthcare system. At this stage, it should be emphasized, that the IMEP – a framework for the NRHM – draws from these many instruments and is not new instrument. It is intended to be a synthesis of the important features of these instruments and other best practices. It aims to establish and maintain high quality standards vis-à-vis infection management and environmental management.

2

Policies, Legislation and Regulations

2.1 Introduction

There is a variety of policy, legal and regulatory instruments in the health sector. At the National level, there are policies from the Ministry of Environment & Forests (MoEF), policies, guidelines and manuals from the Ministry of Health & Family Welfare (MoHFW), and guidelines from the Central Pollution Control Board (CPCB). At the State level, some states have issued their own guidelines. In this chapter, these instruments and their contents are briefly discussed. Their relevance to the NRHM is also brought out.

2.2 Environmental Regulations from the MoEF

2.2.1 Environmental Protection Act, 1986

The Government of India (GoI) enacted the Environmental Protection Act, 1986, (EPA) under Article 253 of the Constitution. The purpose of this Act is to serve as an "umbrella" legislation designed to provide a framework for central government coordination for the activities of various established central and state authorities.

As this is an "umbrella" and all-encompassing legislation, this is relevant to the health sector activities as well. There are rules / notifications that have been brought out under this Act, which are directly relevant to the health sector. These rules / notifications are covered in the rest of this section. More at: http://www.envfor.nic.in/legis/env/env4.html

2.2.2 Bio-Medical Waste Management Rules, 1998 (Amended in 2000 and 2003)

Under the Environmental Protection Act, the Bio-Medical Waste Management Rules were introduced. These Rules are directly relevant to the health sector. The salient features of these Rules are as follows:

- Bio-medical wastes means waste that is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals.
- It is the duty of every occupier of an institution generating bio-medical waste which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank by whatever name called to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment.

- Bio-Medical waste shall not be mixed with other wastes.
- Bio-Medical waste shall be segregated into containers/bags at the point of generation in accordance with Schedule II of these Rules prior to its storage, transportation, treatment and disposal. The containers shall be labeled according to Schedule III of these Rules.
- Bio-Medical waste shall be treated and disposed of in accordance with Schedule I of these Rules, which gives the categories of waste and methods for treatment and disposal. The Rules also require compliance with the standards prescribed in Schedule V, which gives standards for different treatment technologies. These are covered in the Operational Framework of this IMEP Policy Framework.
- Every occupier of an institution generating, collecting, receiving, storing, transporting, treating, disposing and/or handling bio-medical waste in any other manner shall make an application in Form 1 to the prescribed authority for grant of authorisation. This is NOT required for clinics, dispensaries, pathological laboratories, blood banks that provide treatment / service to less than 1000 (one thousand) patients per month.
- Each state or union territory in India is responsible for implementing the Bio-Medical Waste Management Rules, and State Pollution Control Boards in states or Pollution Control Committees in the union territories are designated as the prescribed authorities.

All activities done under the NRHM should be in full compliance with these Bio-Medical Waste Management Rules. More at: http://www.nihfw.org/ndc-nihfw/html/Legislations/Bio-medicalWasteManagement.htm

2.2.3 EIA Notification, July 2004

In July 2004, the MoEF brought out a notification under the EPA that has implications for the health sector. This notification states that any construction project including new townships, industrial townships, settlement colonies, commercial complexes, hotel complexes, hospitals and office complexes for 1,000 persons or above, or discharging sewage of 50,000 litres per day or above, with an investment of Rs. 50 crores or above requires an environmental impact assessment done. This environmental impact assessment will have to be submitted to the MoEF for clearance. It is only after obtaining this clearance should the construction work commence.

Though this notification may not have a direct implication on the PHCs, sub-centres and outreach activities, this needs to be addressed when investment for new facilities or modifications are considered for District hospitals. All activities done under the NRHM should be in full compliance with this EIA Notification. More at: http://www.envfor.nic.in/legis/eia/so801(e).htm

2.2.4 Other Regulations

There are certain other regulations – that do not directly refer to healthcare facilities – but are indirectly applicable. For instance, mercury waste generated from medical equipment, such as thermometers and dental amalgam, have to be disposed as per the Hazardous Waste (Management & Handling) Rules. More at: http://envfor.nic.in/legis/hsm/so593e.htm

2.3 Guidelines from the Central Pollution Control Board

CPCB has brought out Guidelines that are relevant for the health sector, as detailed below. Under the NRHM, these guidelines should be used wherever applicable. More at: http://www.cpcb.nic.in/bio-medical.htm

2.3.1 CPCB Manual on Hospital Waste Management

In 2000, CPCB brought out this technical guidance in the areas of bio-medical waste segregation, storage, transport and treatment. The CPCB manual gave special emphasis to incineration, covering incinerator emissions, maintenance requirements, operational problems & solutions, and pollution control systems.

2.3.2 Guidelines for Universal Immunisation Programme

Universal Immunisation Programme (UIP) in India is one of the largest health programmes in the world for giving vaccinations to children and women. Most vaccines are given by injection. The programme includes administration of about 200 million injections each year covering about 5.5 lakhs sites in the various urban as well as rural parts including remote/outreach locations of India. The vaccination practice of the UIP so far involved the use of either glass or disposable syringes. Such waste generated in rural areas, particularly at outreach points, is a matter of concern. CPCB has prepared guidelines for disposal of bio-medical wastes that will be generated. The salient features of these Guidelines are captured in the Operational Framework included in this document.

2.3.3 Guidelines on AD Syringes

Studies on injection safety has revealed that a significant number of injections are used in immunisation are unsafe. The GoI decided to introduce Auto Disable (AD) syringes instead of glass or disposable syringes to minimize the risk of infections through reuse of inadequately sterilized and/or infected syringes. However the use of AD syringes will generate relatively large quantities of plastic bio-medical waste, which need to be disposed in an environmentally sound manner. This guidance is provided by CPCB in its Guidelines on AD syringes. This is similar (not contrasting) in content with the Guidelines on Universal Immunisation Programme. The salient features of these Guidelines are captured in the Operational Framework included in this document.

2.3.4 Guidelines on Mercury-Contaminated Wastes

CPCB has recognized that there is a possibility of waste containing mercury and its compounds to be above the permissible limit in terms of the concentration, and hence has to be regarded as hazardous. In November 2005, CPCB has written to all State Pollution Control Boards to make the segregation of mercury-contaminated waste materials a condition for granting authorisation to the healthcare facilities. CPCB also notes that new healthcare establishments will have to ensure the mercury-laden waste is properly segregated, treated and disposed.

2.3.5 CPCB Guidelines on Central Waste Treatment Facilities

CPCB Guidelines on Central Bio-Medical Waste Treatment Facilities sets out requirements for the location, land size, coverage area (maximum number of beds), treatment equipment, and infrastructure setup of the Central Waste Treatment Facilities, collection and transportation of bio-medical waste and disposal of treated bio-medical waste and other operational issues.

2.3.6 CPCB Guidelines for Bio-Medical Waste Incinerators

CPCB Guidelines for bio-medical waste incinerators include requirements for the incinerator design and its air pollution control device, physical structures (incineration and waste storage rooms), operator qualifications, personal protection equipment, and emergency procedures.

2.4 Health Policies and Programmes

2.4.1 National Health Policy

In 2002, MoHFW laid down a National Health Policy, with the objective of achieving an acceptable standard of good health amongst the general population, with more equitable access across the social and geographical expanse of the country. The approach was to increase access to the decentralized public health system by establishing new infrastructure in deficient areas and by upgrading the existing infrastructure.

This policy recognizes linkages with the environment sector and envisages that the environment-related policies & programmes be smoothly interfaced with the health policies & programmes. This inter-linkage is recognized as vital for reducing health risk to the citizens and the consequential disease burden.

2.4.2 Hospital Waste Management Guidelines

In 2002, MoHFW laid down national Guidelines on Hospital Waste Management. In addition to covering the important aspects of the Bio-Medical Waste Management Rules, these Guidelines include good practices, training requirements, management & administration requirements and co-ordination between hospital and outside agencies. These Guidelines are not applicable to the smaller healthcare facilities but Community Health Centres and First Referral Units need to adopt them.

2.4.3 State Health Sector Guidelines

A few States have prepared guidelines to facilitate the implementation of the Bio-Medical Waste Management Rules. The IMEP could be used to reinforce, strengthen and improve these Guidelines.

3

Organisational Arrangements

3.1 National Level

The responsibility for ensuring the implementation of the IMEP lies with the MoHFW, which is the implementing agency for the NRHM. The overall responsibilities will be with the Secretary (MoHFW). The specific responsibility will be with the Infrastructure Division for Infection Management & Environment Plan (IMEP) and with Immunisation Division for issues pertaining to AD syringes.

3.2 State Level

At the State level, the State Department of Health & Family Welfare (DoHFW) is the implementing agency and also holds the responsibility for IMEP implementation. Principal Secretary (DoHFW), Secretaries/Commissioners (H and/or FW) will have the overall responsibility. In the State, an officer will be assigned monitoring responsibility for effective implementation of the IMEP.

At the district level, the District Health Officer will be responsible for the implementation of IMEP. At the health facilities, this responsibility will lie with the Hospital Superintendent or Medical Officer.

It is important to note that the IMEP nodal officers will coordinate IMEP activities and act as focal points to ensure effective, successful implementation. But all healthcare workers will need to be trained and equipped to implement satisfactory infection control practices and sound waste management.

3.3 Setting up a Bio-Medical Waste Management System

To implement the IMEP in a comprehensive systematic manner, a critical first step will be to undertake a thorough review of the existing situation and analysis of the current bottlenecks. The review should encompass current practices of segregation and collection of waste, disinfection and treatment methods, transportation, handling and disposal of waste both within and outside the healthcare setting, availability and use of protective devices and safety precautions followed by healthcare personnel. It will also include health and safety measures adopted by the management for healthcare workers, review of policy with respect to waste management, waste minimization, infection control, antibiotic policy and policy for disinfection procedures. An assessment of knowledge, attitude and skills of various

categories of staff will help determine training needs. Based on this review, a Bio-Medical Waste Management Plan will be developed which will encompass all the key elements of the administration and implementation of infection control and bio-medical waste management in a healthcare facility.

4

Operational Framework

4.1 Introduction

This chapter includes an overview of operational guiding principles on the components related to IMEP. The purpose of this compilation is to have a single, first-level and easy-to-use reference. These guidelines draw from a number of publications / websites of the GoI, WHO and other organisations.

4.2 Infection Control

It is very important to note and recognize that infection control is the responsibility of all healthcare professionals – doctors, nurses, therapists, pharmacists, engineers and others. Preventing nosocomial infections requires a hygienic and sanitized environment and maintenance of good practices and use of protective gear. Routine cleaning of the health facility is absolutely essential, as that will keep the environment free from dust and soil.

Running water, soaps or antiseptic and facilities for drying without contamination are required for healthcare workers to maintain cleanliness at all times. As a general practice of maintaining good hygiene, the floors of the healthcare facility should be first swabbed with a wet cloth, then swept to remove grits to avoid dust carrying pathogens from rising into the air and, finally, swabbed with a disinfectant solution. The swab cloth should be washed with detergent after every use. Infected linen in the hospital should be carefully packed in plastic bags, taken to the washing area, stored in bleach solution and then washed with the usual cleaning agents.

4.3 Treatment and Disposal of Bio-Medical Wastes

This section draws from the requirements of the Bio-Medical Waste Management Rules. All health facilities should treat and dispose the bio-medical waste as per Schedule I of the Rules. (attached as Table 4.1).

Wherever possible, health facilities should plan to use Common Bio-Medical Waste Treatment Facilities (CWTF), if they exist in the vicinity. It should enter into a contract with such CWTFs for the collection, treatment and disposal of the facility's bio-medical waste.

If there is no access to a CWTF, the healthcare facility should manage the potentially infected bio-medical waste as follows:

Table 4.1 Bio-medical Waste Management Rules – Schedule I

Option	Waste Category	Treatment and disposal
1	Human Anatomical Waste (human tissues, organs, body parts)	Incineration / deep burial
2	Animal Waste (animal tissues, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals colleges, discharge from hospitals, animal houses)	Incineration / deep burial
3	Microbiology & Biotechnology Waste (wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, dishes and devices used for transfer of cultures)	Local autoclaving / microwaving / incineration
4	Waste sharps (needles, syringes, scalpels, blades, glass, etc. that may cause puncture and cuts. This includes both used and unused sharps)	Disinfection (chemical treatment/ auto claving/microwaving and mutilation/shredding)
5	Discarded Medicines and Cytotoxic drugs (wastes comprising of outdated, contaminated and discarded medicines)	Incineration, destruction and drugs disposal in secured landfills
6	Solid Waste (Items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, lines, beddings, other material contaminated with blood)	Incineration / autoclaving / microwaving
7	Solid Waste (wastes generated from disposable items other than the waste sharps such as tubings, catheters, intravenous sets etc).	Disinfection by chemical treatment / autoclaving / microwaving and mutilation shredding
8	Liquid Waste (waste generated from laboratory and washing, cleaning, house-keeping and disinfecting activities)	Disinfection by chemical treatment and discharge into drains
9	Incineration Ash (ash from incineration of any bio-medical waste)	Disposal in municipal landfill
10	Chemical Waste (chemicals used in production of biologicals, chemicals used in disinfection, as insecticides, etc.)	Chemical treatment and discharge into drains for liquids and secured landfill for solids

Notes: (1) Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.
(2) Mutilation/shredding must be such so as to prevent unauthorised reuse.
(3) There will be no chemical pretreatment before incineration. Chlorinated plastics shall not be incinerated.
(4) Deep burial shall be an option available only in towns with population less than five lakhs and in rural areas.
Source: Bio-medical Waste Management Rules, 1998, Schedule I. More at: http://www.nihfw.org/ndc-nihfw/html/legislations/biomedicalwastemanagement.htm

- All sharps in their puncture proof containers should be disinfected and should be disposed of in the sharps pit, which is to be located within the premises of the health care facility. See also Table 4.4; 4.5; 4.6.
- Infected organic waste, after disinfection, should be taken to the onsite deep burial pits and covered with a layer of lime and soil.
- Infected recyclables such as plastics and metals should be first disinfected using bleach solution and / or autoclaved before sent for recycling.

If there is no organised collection of garbage / municipal solid waste, the general / communal waste – non-infected - should be managed as follows:

- Organic waste such as kitchen waste and leaf fallings put in a compost pit, which is to be located within the premises. Standard composting methods such as mixing the waste with leaf fallings and soil should be done. Compost will be available within a few days and this should be used for the garden. Care must be taken to ensure that the organic waste is not infected by segregating the infectious waste at source.
- Recyclable material such as packaging material and paper should be sold to authorised recyclers. Care must be taken to ensure that the recyclable waste is not infected and kept separated form infectious wastes at all times.

All equipment used for bio-medical waste treatment should be periodically maintained. Both preventive and corrective maintenance schedules and records should be retained in the health facility.

4.4 Segregation of Waste and Onsite Storage

Segregation of waste at source is a single most important step in bio-medical waste management. Once bio-medical waste mixes with general waste, the waste management problem magnifies and becomes unmanageable.

It is critical that wastes be segregated at the point of generation itself. Bio-Medical Waste Management Rules 1998 gives the colour coding that should be used for the various categories of waste. Table 4.2 provides the information given in these Rules.

All waste containers should be made of good quality plastics or other strong material. These should have smooth inner and outer surfaces to avoid dirt / dust sticking in indentations. They should be lined with non-chlorinated plastic liners and should be kept closed at all times.

The onsite storage locations should be properly planned and be made available. Ideally, these should be nearest to the point of generation. Where potentially infected wastes are generated, 2% bleach solution (freshly prepared twice a day) should be put in the waste container and the waste should be put in the container having this solution.

The quantity of waste in each of the waste containers should be weighed and a log should be maintained. This should be done prior to evacuating the container into the final onsite disposal.

Table 4.2 Waste storage in Healthcare Facilities– Colour Coding

Colour Coding	Waste Category	Treatment option as per Schedule I
Yellow	Plastic bag Cat. 1, Cat. 2, and Cat. 3, Cat. 6.	Incineration / deep burial
Red	Disinfected container/plastic bag Cat. 3, Cat. 6, Cat.7	Autoclaving / Microwaving / Chemical Treatment
Blue / White Translucent	Plastic bag/puncture proof Cat. 4, Cat. 7. Container	Autoclaving / Microwaving / Chemical Treatment and Destruction / shredding
Black	Plastic bag Cat. 5 and Cat. 9 and Cat. 10. (solid)	Disposal in secured landfill

Notes:
1. Colour coding of waste categories with multiple treatment options as defined in Schedule I, shall be selected depending on treatment option chosen, which shall be as specified in Schedule I.
2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.
3. Categories 8 and 10 (liquid) do not require containers/bags.
4. Category 3 if disinfected locally need not be put in containers/bags.
Source: Bio-medical Waste Management Rules, 1998,
More at:http://www.nihfw.org/ndc-nihfw/html/legislations/biomedicalwastemanagement.htm

The waste from colour-coded containers should be transported to the appropriate disposal points. All personnel responsible for the waste containers should wear gloves, masks, aprons and proper footwear. The personnel should wash their hands and feet with soap and disinfectant solution after every handling of these containers.

Cleaning (sweeping and swabbing) should be undertaken twice daily and all the waste from the dust bins should be emptied twice a day.

No infectious wastes should be stored beyond 24 hours.

4.5 Transportation of Bio-Medical Wastes

Bio-medical wastes have to be transported both within the health facility and from the facility to the final disposal location. Properly designed carts, trolleys and other wheeled containers should be used for the transportation of waste inside the facilities.

Wheeled containers should be so designed that they have no sharp edges. Ergonomics must be taken into account in designing these wheeled containers by considering the different tasks, i.e. loading, securing and unloading. Transportation of waste has to be done in line with the Bio-Medical Waste Management Rules. One of the requirements is labeling and the typical contents of the label are included in Table 4.3.

Waste handlers must be provided with uniform, apron, boots, gloves and masks, and these should be worn when transporting the waste.

Table 4.3 Labeling Requirements Prior to Waste Transportation

LABEL FOR TRANSPORT OF BIO-MEDICAL WASTE CONTAINERS / BAGS

Day _____ Month _____

Year _____

Date of generation _____

Waste category No _____

Waste class _____

Waste description _____

Sender's Name & Address _____

_____

Phone No_____

Telex No _____

Fax No _____

Contact Person _____

Receiver's Name & Address _____

_____

Phone No _____

Telex No _____

Fax No _____

Contact Person _____

In case of emergency please contact

Name & Address : _____

Phone No. _____

Note : Label shall be non-washable and prominently visible.

Source: Bio-medical Waste Management Rules, 1998, Schedule II.

4.6 Handling Sharps

The safe disposal of used needles & syringes and other infectious sharps are a critical component of a bio-medical waste management programme. Sharps are anything that may cause puncture and cuts and include needles, syringes, scalpels, blades, broken glass, slides, lancets, sutures, and IV catheters. While handling sharps and undertaking procedures, healthcare workers must always use protective gear, such as gloves. It is important that all healthcare workers be vaccinated against Hepatitis B.

Sharps must be segregated and stored in puncture-proof containers at the point of generation. Sharps should not be left casually on counter tops, food trays, on beds as grevious injuries can result.

Treatment of sharps is done, i.e. by treating with 1% hypochlorite solution or any other equivalent chemical reagent. Treatment through autoclaving / microwaving is also approved.

Prior to disposal, mutilation must be done. This can be at the point of generation by using needle cutters / destroyers or centrally by using shredders after disinfection of sharps is done. Clipping, bending or breaking of needles to make them non-usable must not be practised as this may cause accidental inoculation.

Final disposal should be in a secured landfill. Wherever this is not available everywhere, sharps pits or encapsulation should be used.

- A sharps pit is essentially a circular or rectangular pit, where sharp wastes are disposed. These pits are lined with brick, masonry or concrete rings. The pit should be covered

Table 4.4 AD Syringes – Instructions for Use

No.	Steps / Stages
1	Select the correct syringe for the vaccine to be administered
2	Check the packaging. Don't use if the package is damaged, opened or expired.
3	Peel open or tear the package from the plunger side and remove the syringe by holding the plunger. Discard the packaging into a black plastic bag.
4	Remove the needle cover / cap and discard it into the black plastic bag. Do not move the plunger until you are ready to fill the syringe with the vaccine and do not inject air into the vial as this will lock the syringe.
5	Take the appropriate vaccine vial, invert the vial, and insert the needle into the vial through the rubber cap. Insert the needle such that the tip is within the level of the vaccine. If inserted beyond you may draw air bubble, which is very difficult to expel. Do not touch the needle or the rubber cap (septum) of the vial.
6	Pull the plunger back slowly to fill the syringe. The plunger will automatically stop when the necessary dose of the vaccine has been drawn (0.1 or 0.5 ml). Do not draw air into the syringe. In case air should accidentally enter the syringe, follow these steps to remove the air bubbles: (a) Remove the needle from the vial. Holding the syringe upright, tap the barrel to bring the bubbles towards the tip of the syringe. (b) Pull the plunger back to allow air to come in through the needle until it comes in contact with the air bubble in the syringe barrel. (c) Then carefully push the plunger to the dose mark (0.5 or 0.1 ml) thus expelling the air bubble.
7	Clean appropriate injection site, if necessary with a wet swab and administer the vaccine.
8	Push the plunger completely to deliver the dose till it gets locked.
9	Cut the hub of the syringe immediately after use with a hub-cutter that collects the sharps in a hard white translucent plastic container. Do not recap the needle. Then collect the cut syringes in a red plastic bag. The cut / destroyed syringes, barrels and needles must be disinfected at the designated place and properly disposed off.

Source: GoI Guidelines.

with a concrete slab. When the pit is full, it should be sealed completely and another pit is prepared.

- Encapsulation is another method. When a container (puncture & leak proof containers) is three-quarter full, material such as cement mortar, bituminous sand, plastic foam or clay is poured until the container is completely filled. After the medium has drived, the containers are sealed and disposed in landfill sites.

4.7 Use and Disposal of Auto-Disable (AD) Syringes

The MoHFW recommends that Auto-Disable (AD) syringes are to be used for immunisation instead of glass or disposable syringes.

In parallel to introducing AD syringes, MoHFW has also developed and disseminated detailed user guidelines that outline steps that should be followed when using an AD syringe and disposing of AD syringes.

Tables 4.4 and 4.5 define the steps to be followed for use and disposal of AD syringes.

Table 4.5 Guidelines for Disposal of used AD Syringes

No.	Steps / stages
1	Remove needles from AD syringe immediately after administering injection at the Immunisation site using a hub-cutter that cuts plastic hub of syringe and not the metal part of needle
2	The cut needles will get collected in the puncture proof white translucent container of the hub-cutter.
3	Segregate and store syringes and unbroken (but discarded) vials in red bag or container. If the Immunisation waste is generated from outreach centres, then handover these to the District Hospitals / CHC / PHC for further disposal.
4	Send the collected materials to the Common Bio-Medical Waste Treatment Facilities. If such facilities do not exist, then go to the next step.
5	Treat the collected material in an autoclave. If it is unable to impart autoclaving, boiling such waste in water for at least 10 minutes / chemical treatment may be imparted. It shall be ensured that these treatments ensure disinfection. However, such District Hospital / CHC / PHC shall ultimately make necessary arrangements to impart autoclaving treatment on regular basis.
6	Dispose the autoclaved waste as follows: (i) Dispose the needles and broken vials in a pit / tank, (ii) Send the syringes and unbroken vials for recycling or landfill.
7	Wash properly the containers for reuse.
8	Make a proper record of generation, treatment and disposal of waste.

Source: GoI Guidelines

4.8 Use and Sterilization of Glass Syringes

Though AD syringes are to be used for immunisation, the use of glass syringes will continue for other purposes, particularly in primary healthcare. This section gives guidelines on how glass syringes are to be used. Table 4.6 gives the guidelines for the use of glass syringes.

Table 4.6 Guidelines using Glass Syringes

No.	Steps / stages
1	Glass syringes should be sterilised in an autoclave that is operated by electricity. The autoclave could also be operated with gas as a back up.
2	At any point, the Healthcare Facility should have at least twice the average number of syringes used in a day.
3	The volume / size of the autoclave should be suitable for the number of syringes administered every day.
4	Each autoclave should be provided with two numbers of compatible steel bins with lids.
5	The bin from the autoclave should be taken out and kept at the nursing station with its lids closed.
6	Tongs should also be sterilised and should remain in the bin for use repeatedly.
7	The syringes should be removed from the bin using the tong and the tong should be replaced back into the bin immediately.
8	The used syringes should be placed in a separate steel bin and at the close of the day, should be sent for sterilisation. This will avoid multiple handling of the used syringes.
9	In locations where hard water is found, scaling can occur and the glass syringes will be non-functional. In such cases, mineral water / distilled water supply should be made.

Source: EA & EMP report, 2004, Karnataka Health Reforms and Development project, Government of Karnataka.

4.9 Mercury Waste Disposal

All health facilities utilize products containing mercury such as thermometers, sphygmomanometers, esophageal, Abbott & Cantor tubes and dental amalgams. In dealing with mercury, appropriate care should be taken as mercury is classified as a hazardous substance that is known to cause serious health impacts.

Bio-medical waste containing mercury has to be segregated, treated and disposed in an appropriate manner. Mercury-contaminated waste should not be mixed with other bio-medical waste or with general waste. Precaution should be taken not to handle mercury with bare hands and as far as possible, jewellery should be removed at the time of handling mercury. After handling mercury, hands must be carefully washed before eating or drinking.

Appropriate personal protective equipment (rubber gloves, goggles / face shields and clothing) should be used while handling mercury.

Mercury-containing thermometers should be kept in a container that does not have a hard bottom. Prefer a plastic container to a glass container, as the possibility of breakage will be less.

In case of breakage, cardboard sheets should be used to push the spilled beads of mercury together. A syringe should be used to suck the beads of mercury. Mercury should be placed carefully in a container with some water. Any remaining beads of mercury will be picked up with a sticky tape and placed in a plastic bag, properly labelled (see Table 4.3.).

As mercury waste is a hazardous waste, the storage, handling, treatment and disposal practices should be in line with the requirements of GoI's Hazardous Waste Management Rules. It should not be swept down the drain and wherever possible, it should be disposed off at a hazardous waste facility or given to a mercury-based equipment manufacture.

Reporting formats must be used to report and register any mercury spills / leakages. All information on the health and safety hazards of mercury should be communicated to all healthcare workers. It is recommended that a mercury phase-out plan be developed, to start procurement of new equipment which is mercury-free.

4.10 New Healthcare Facility – Site Selection

When a new healthcare facility is planned, site selection is an important consideration. A site wrongly chosen can result in persistent environmental problems.

The following points should be given due consideration prior to the selection of the new / greenfield site for a health Facility (district hospital or PHC or sub-centre):

- The chosen site should have adequate water supply, both for washing / cleaning and drinking purposes. In particular, the quality of water should be tested as poor quality of drinking water could be a health hazard.
- Prior land use of the proposed site should be determined, as the facility should necessarily be built only on non-hazardous land.
- The drainage pattern of the site and the region should be studied to determine whether the site would be subject to flooding and stagnant water. The chosen site should be free from water-logging problems.
- The siting of the new facility should not harm the natural habitats or biodiversity of the region, e.g. forest areas, wet lands, historic, archaeological or religious sites.
- The siting of new facility should not be in close proximity to areas susceptible to health or other hazards (such as slow-moving water bodies, industrial waste disposal sites, municipal landfills and/or any other probable source of infectious diseases).

4.11 Healthcare Facilities – Guidelines for Design

Designing a layout of a facility or a building is important as any deficiencies can result in health and environmental issues during its operation. In this section, some guidelines for design have been included.

General

- The facility should be large enough to provide health service delivery for target populations. Coherent and responsive planning should be included based upon present and projected needs.
- Facility design features must assure adequate space and equipment for health service delivery.

Equipment-related Specifications

- Appropriate standards for non-medical equipment (solar hot water, pumping systems, sanitary equipment, etc) are to be in compliance with Bureau of Indian Standards.
- Specifications for medical equipment should be in compliance with applicable norms.

Bio-Medical Waste Management Facilities

- Medical waste segregation, collection, storage, treatment and disposal are to be practised or outsourced as per the Bio-Medical Waste Management Rules.
- In designing the layout of a facility, proper waste movement should be planned.
- Storage bins and collection equipment for different categories of waste should be provided.
- Lockable storage space should be provided for segregated infectious waste prior to disposal or transport to other facilities for disposal.
- Areas should be earmarked for sharps pit and deep burial pits, if there isn't any access to centralized bio-medical waste treatment facilities.

Building-related Specifications

- Proper ventilation and natural lighting should be provided as they may cause adverse health impacts. Lighting and ventilation standards should be in compliance with Indian norms.
- Good indoor air quality and ventilation should be ensured in the building design.
- The flooring design should be such that it does not lead to falls, slippage, and retention of infectious material
- Good construction practices should be planned. This should include the usage of environment friendly construction products such as fly ash.
- Building materials should be fire resistant and there should be provision for evacuation in the event of fire.
- Building materials should preferably not contain asbestos

Food Prepared at the Health Care Facility

- Keep Clean - This stops microorganisms from growing and spreading. Wash hands thoroughly with lots of soap and plenty of clean water before cooking, preparing food or even touching food
- Separate Raw and Cooked - This stops microorganisms from spreading.

- Cook Thoroughly - This kills microorganisms.
- Keep Food at Safe Temperatures - This stops microorganism from growing.
- Use Safe Water and Raw Materials - This stops microorganisms and chemicals

Water Supply and Quality

- Adequate provision for storage of sufficient volumes of water should be provided to ensure continuous availability of water to all designated locations within the building during any period and when water supply is interrupted.
- Water supply must be assured on a regular basis. A fallback mechanism should be made, if the water supply fails.
- Water supply and distribution standards should be in compliance with Indian norms.
- Water supply should be planned to all required points of use in the facility in sufficient volumes and pressure to satisfy needs.
- Wherever possible the facility should get the water supply from the water board and adequately treat it and make it potable.
- Water quality must meet acceptable norms. If not, provisions for clean drinking water in sufficient quantities should be made. Specific plans to address any particular issues of water quality, such as arsenic and fluoride contamination, should be made if that is required.
- Water quality should be monitored and controlled periodically.
- Rainwater harvesting systems should be planned in all the buildings in the facility.

Waste water and Sanitation

- Sanitary standards for waste water treatment storage and disposal should be in compliance with Indian norms
- Possible improper and indiscriminate disposal of solid waste, garbage, blocked drains, stagnant water within and outside the health facilities need to be addressed at the planning stage itself.
- Sufficient number of toilets should be provided.
- Waste water and effluents should be treated and recycled wherever feasible.
- Provisions should be made for septic tanks and soak pits in all Healthcare Facilities.
- Adequate drainage and evacuation arrangements should be made at all points where water is available.

General / Communal Solid Waste

- Sufficient number of bins should be provided to collect general / communal solid waste
- Wherever the collection of garbage / municipal solid waste is not streamlined by the municipality / panchayat, a pit to decompose organic waste should be provided for.
- For recyclables, storage locations should be planned.

Miscellaneous

- The facility / building should have an emergency access.
- Easy access for the physically challenged should be provided.
- Unsafe building materials such as asbestos should be avoided
- Lead-based paints, anti-termite chemicals and other pesticides should be avoided

4.12 Construction of Management Guidelines

Any construction of a building / facility creates environmental impacts, which can be minimized through good construction management practices.

- Generation of dust is common in a construction site. In order to reduce dust emissions, periodic watering should be done. In addition, temporary fencing should be provided along the boundary so that the emissions do not affect the immediate neighbours.
- Construction should be carried out only during the daytime and as per permitted timings. If there is an educational institution in the neighbourhood, proper temporary noise barriers should be erected to reduce construction-related noise impacts.
- Labour camps on site should be as per Indian norms.
- Construction waste generated should be properly stored on site and disposed by filling low-lying areas after obtaining the required local permissions.
- Possible lubricant, fuel and oil spillages in the site should be attended at the earliest in order to minimize land & groundwater contamination.
- Construction workers, managers and visitors to the site should use personnel protective equipment such as helmets, gloves, safety boots and goggles.
- Clean water and well-maintained toilets should be made available at the construction site.
- If there is any eco-sensitive habitat in the vicinity of the construction site, care should be taken to ensure that there are no adverse impacts on the habitat.

4.13 Drug Expiry Management

Expired drugs need to be carefully managed, so that they do not re-enter the treatment chain nor do they harm the environment. Better management practices based more on demand , less on supply driveness, can help reduce the quantum of accululate drugs that will end up become expired.

All health facilities need to maintain an inventory of drugs along with their expiry dates. Periodic check of the inventory to review expiration dates of the drugs will be necessary and arrangements for disposal or removal by the drug distributor / manufacturer needs to be determined. The quantity of drugs returned by a particular facility will be used to determine how much allocation that facility should get in future.

5

Awareness and Training

5.1 Awareness

Every state should plan and undertake general awareness raising activities for IMEP, which should include all levels of healthcare facilities and officers. All IMEP related awareness activities should be fully integrated with those being undertaken under the other national health programmes. Since the IMEP is in English, each State will arrange to translate the two volumes into local language(s).

Professional bodies like Federation of Obstetrics and Gynaecological Societies of India, Indian Academy of Paediatrics, Indian Medical Association and Trained Nurses Association of India can be involved in enhancing understanding and promoting good practices. At the health facilities, appropriately located display of IEC materials is most effective in ensuring that workers follow segregation, treatment and infection control practices.

5.2 Training

The state will be responsible for training its healthcare workers and officers in IMEP implementation. It is recommended that there be two types of training modules – (i) train-the-trainer and (ii) regular on-going training within the health facilities.

The state IMEP nodal officer should undertake a needs identification to facilitate planning and allocation of budget for this activity.

It is advisable that all health care facilities in the country have officially recognized trained health personnel who will be responsible for bio-medical waste management.

Existing awareness and training materials can be used to further develop the skills for the sound management of bio-medical care wastes. These resources are available with a number of agencies, specialized bodies, academia and NGO's. Examples include:

- The Indira Gandhi National Open University, School of Health Sciences, offers a 6 month certificate course in the "Sound Management of Healthcare Waste", that is officially recognized by the Indian Government. More at: http://www.ignou.ac.in/
- Centre for Environmental Education has developed a complete "National Kit of Education Material on Bio-Medical Waste Management". More at: http://www.ceeindia.org/cee/waste_m.html#bio

- Toxics Link, an NGO, offers awareness and training materials for the Management of Health Care Waste and specifically for the management of mercury spills. More at: www.toxicslink.org
- World Health Organisation has useful tools available online at– www.Healthcarewaste.org

6

Monitoring & Evaluation

Monitoring & Evaluation will be done through a mix of internal and external approaches. MoHFW, the State DoHFW, District Health Officers and the individual health facilities will be involved in regular internal monitoring. External monitoring will be done by an independent agency. This chapter covers what and how these two broad types of monitoring will be done.

6.1 Internal

As a part of the NRHM, quarterly progress monitoring is to be done at all levels, i.e. District to State and State to MoHFW. In turn, MoHFW will have to submit quarterly progress monitoring reports to the multilateral and bilateral agencies providing financial support.

These quarterly progress reports should include a collation / aggregation of the data / information compiled in each healthcare facility and also other IMEP implementation issues. No separate IMEP implementation reports are required to be submitted. These should be a part of the NRHM progress reports.

IMEP implementation will be reviewed by MoHFW, as a part of the RCH-II PIP Appraisal process and the Joint Review Missions (JRM), in collaboration with the donor partners of RCH-II. The review will cover the following:

- Status of IMEP implementation, positive outcomes and how to improve poor performance.
- Training implementation and its effectiveness.
- Need for modifications to existing operational guidelines or introduction of new guidelines

A set of monitoring indicators for IMEP implementation should be merged with the overall Management Information Systems (MIS) that has been established and maintained under the NRHM.

6.2 External

State-level Implementation Audits

Each State should commission an independent evaluation after 24 months of implementation experience. At the very minimum, the audit will cover one district that is performing well and another that has been slack in performance.

The agency to conduct the IMEP implementation audit will be chosen based on its background and experience in the State's health sector, environmental auditing and reputation for reliability. The chosen agency will submit an audit report, with its findings, conclusions and recommendations.

The recommendations of the audit should be developed into an action plan to improve the existing system. It is expected that the IMEP Policy Framework and Operational Guidelines will be revised and updated by the states, depending on their implementation experience.

7

Action Plan

The Action Plan provides generic guidance on the main tasks to be undertaken at the National and State levels. This includes a brief description of the tasks, assignment of responsibility and timelines for their completion from the start date.

Table - 7.1: Action Plan for Year I and II

No.	Tasks	Responsibility
A.	**Organisational Arrangements**	
A1	Appointment of the National IMEP Nodal Officer	MoHFW
A2	Appointment of the State IMEP Nodal Officer in the different states	Respective State DOHFW
A3	Appointment of the Capacity-building consultants	MoHFW
A4	Formation of the National IMEP Committee and conduct of its first meeting	MoHFW
B.	**Awareness, Training and Communication**	
B1	National Workshop for State IMEP Nodal Officers	MoHFW
B2	Training development	MoHFW
B3	Training implementation – Year I	MoHFW & State DoHFW
B4	Training needs assessment for planning Year II training	State DoHFW
B5	Training implementation – Year II	State DoHFW
B6	Training needs assessment for planning Year III training	State DoHFW
B7	Awareness-building workshops & other initiatives	State DoHFW
C.	**Monitoring & Evaluation**	
C1	Streamlining of IMEP monitoring as a part of the overall quarterly progress reporting	MoHFW & State DoHFW
C2	External audit (once every 2 years of IMEP implementation	MoHFW & State DoHFW
C3	Appointment of the Capacity-Building consultants	MoHFW
C4	Formation of the National IMEP Committee and conduct of its first meeting	MoHFW
D.	**IMEP Implementation Review**	
D1	Review (National / State) for Year I	MoHFW / State DoHFW
D2	Review (National / State) for Year II	MoHFW / State DoHFW
E.	**Budget Allocation**	
E1	Budget planning for Year II (National PIP / State PIP)	MoHFW / State DoHFW
E2	Budget planning for Year III (National PIP / State PIP)	MoHFW / State DoHFW

8

Budget

IMEP implementation requires funds for assets such as creating disposal arrangements or purchase of an autoclave for waste treatment or maintenance of civil works / equipment at the Healthcare Facility. Additionally, budgetary support will be needed for other initiatives such as awareness seminars / workshops, training programmes and communication activities. As a part of the State Programme Implementation Plan (PIP) that is prepared annually, a separate budget item for the IMEP implementation has to be included. States will ensure that the budgeting exercise is done prior to the budget finalization and this is properly included.

9

References

Table 9.1 gives a list of references used in developing the IMEP Policy Framework. This includes information in print form or on the web or both. Particular references are provided to enable quick and easy access to this additional information.

Table 9.2 gives a list of participants of the IMEP Consultation

Table 9.1 Literature References

No.	Title / Description
1	Centre for Environmental Education - National Kit of Education Material on Bio-Medical Waste Management, Developed by Centre for Environment Education, 2004
2	CPCB - Universal Immunisation Programme, CPCB Guidelines.
3	IGNOU - Certificate Program on Bio-medical Waste Management developed by IGNOU and WHO, SEARO
4	MoEF - Bio-Medical Waste (Management and Handling) Rules, 1998 and supporting guidelines issued by CPCB.
5	State Guidelines - Hospital Waste Management Manuals and Training Guides developed by State Health systems Development Projects, Karnataka and West Bengal.
6	Toxics Link - Lurking Menace – Mercury in the health-care sector, Toxics Link, June 2004.
7	Toxics Link / Srishti - Managing Hospital Waste, A Guide for Healthcare Facilities, Srishti, September 2000
8	Toxics Link - Understanding and Simplifying Bio-medical Waste Management- A training manual for trainers, Toxics Link, 2005
9	World Bank - Safe Management of Healthcare Wastes Corporate Guidance Note on the Application of the World Bank's Environmental Assessment Policy, The World Bank.
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12	WHO - Decision-Making guide for managing health-care waste from primary health-care centres, WHO, 2001.
13	WHO - "First, do no harm", Introducing auto-disable syringes and ensuring injection safety in immunisation systems of developing countries, WHO, 2002.
14	WHO - Rushbrook P. and R. Zghondi, Better Healthcare Waste Management, An Integral Component of Health Investment, WHO, 2005.
15	WHO - Healthcare Waste Management – www.Healthcarewaste.org , WHO Website.

Table 9.2 List of Participants

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