Republic of Zambia
Ministry of Health

CURRICULUM

For

CERTIFICATE IN HEALTH-CARE WASTE MANAGEMENT

September, 2019

Forward

Health-care services inevitably create waste that may itself be hazardous to health and as a result the Ministry of Health (MoH) in its aims of reducing health problems and eliminating potential risks to people's health has felt it necessary to prioritise healthcare waste management at all its health facilities. This is because waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. This therefore calls safe and reliable methods for its handling wherever waste is generated.

This curriculum is designed to prepare participants / learners to understand and appreciate the impact of inadequate and inappropriate handling of health-care waste that it may have serious public health consequences and a significant impact on the environment. This therefore means that provision of sound management of healthcare waste, training of personnel, and raising public awareness are crucial and essential components of environmental health protection for successful healthcare waste management.

Acknowledgement

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List of Abbreviations & Acronyms

ADR:	European agreement concerning the international carriage of dangerous goods by road
Blue Book:	Shortened title for this handbook, Safe management of wastes from health-care activities
CQI :	Continuous Quality Improvement
GEF :	Global Environment Facility
HCWM:	Healthcare waste Management
I- RAT:	Individualized Rapid Assessment Tool
IC :	Infection Control
IPC :	Infection Prevention and Control
MoH :	Ministry of Health
POPs :	Persistent Organic Pollutants
PVC :	Polyvinyl chloride
ToRs :	Terms of Reference
UNDP :	United Nations Development Programme
UPOPs:	Unintended Persistent Organic Pollutants
WASH FIT:	Water and Sanitation for Health Facility Improvement tool
WHO :	World Health Organisation
ZEMA :	Zambia Environmental Management Agency

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1.0 BACKGROUND

This curriculum on "Reducing Unintended Persistent Organic Pollutants (UPOPs) and Mercury Releases from the Health Sector in Zambia has made provision to address shortfall in human resource required in the efficient management of healthcare waste. Furthermore, non-incineration healthcare waste treatment technologies and mercury-free medical devices for reducing harmful releases from the health sector have been introduced. The main aim is to minimize or eliminate releases of UPOPs in order to help Zambia meet its obligations under the Stockholm Convention on Persistent Organic Pollutants (POPs). It also seeks to support phasing out use of medical devices and products containing mercury and this is done while improving practices of managing mercury containing wastes. It is envisaged that the release of mercury will be reduced, thus protecting human health, the environment and fostering Zambia's compliance with the obligations under the Minamata Convention. This course will also contribute to the reduction of spread of infections both at healthcare facility level and in places where healthcare waste is handled through support to the improvement of healthcare waste management systems (e.g. through improved classification, segregation, storage, transport and disposal).

2.0 RATIONAL FOR THE COURSE

The health sector has been in the limelight to reduce unintended UPOPs and Mercury releases, due to improper healthcare waste management system in the healthcare facilities. The health science curricula in Zambia address some of Healthcare Waste Management (HCWM) aspects but leaves out those in-service healthcare providers who completed their training before inclusion of HCWM in their curricula. This demand has put pressure on policy makers, health facility managers, waste management practitioners and cooperating partners to seek for better ways of handling healthcare waste in the Healthcare facilities. The demand has made it imperative for Zambia to review curricula in schools of health sciences, legal and regulatory framework in the management of healthcare waste at the health facility.

The critical issue was human resources charged with the responsibility of supervising and undertaking actual handling of healthcare waste management related activities. The capacity gaps in terms of handling of healthcare waste at the facility level became evident during the distribution of healthcare equipment and related products. This created the need to enhance capacity building initiatives that would equip in-service staff who were trained before the aspects of HCWM was included in the curricula. This was also applicable to other staff at the facility level mandated with the responsibilities but not formally trained in the rudiments of healthcare waste management.

3.0 PROCESS FOLLOWED FOR THE CURRICULUM DEVELOPMENT

The development of the curriculum followed recommendations of the contractual Terms of Reference (ToRs) for curriculum development. The job descriptions for Health Managers in healthcare facility overseeing healthcare waste management were considered. The process also included examination of the roles, functions and responsibilities for managers of healthcare waste management at healthcare facility. Other documents consulted included guidelines on healthcare waste focusing on the constraints and difficulties faced in system and consequent on human health and the environment in general.

4.0 DETAILED HEADINGS FOR CONTEXTUAL SESSION DESCRIPTION

The sessions are the restructured to provide a logical flow based on three-day period allocated for the training programme. This structure is further explained in more detail, using the following contextual heading:

- Session: name of the session
- Estimated Time: duration in contact minutes of the Session
- Session overview: why and what is the relevance of the topic, tool and skills addressed in this session from the perspective of the Health Managers in healthcare facility overseeing healthcare waste management should be able to do, explain, apply and present after completing the session.
- Learning Objectives: main objectives of the session
- Contents: elements reserved for that part
- Teaching methods: more general approach of teaching in the block descriptions, the more specific teaching methods used are described
- Assessment methods: in what way the learning objectives of that specific Session will be tested. This can be a supervised report, oral answer questions, etc.
- Student References: Links to other authors in order to stress the coherence

5.0 AIMS AND GENERAL APPROACH OF THE COURSE

The purpose of this course is to prepare healthcare professionals and workers in healthcare facilities overseeing healthcare waste management to acquire knowledge and skills that would enable them to effectively manage healthcare waste in health facilities so as to maximise the quality of public health services, within the limits of resource constraints. Thus in order to respond to their needs, the course is based on the tasks of these managers. Therefore, a detailed task description of the manager of healthcare waste has been used to develop the aims, and derived from that, the detailed learning objectives of the course.

5.1 Profile

A typical “Healthcare Waste Officer” is part of the team of health workers that is able is to manage healthcare waste at health facility level. In a participatory process with other team members they are able to develop realistic plans to meet health needs. This is because he/she is responsible for the organisation, monitoring, and evaluation of routine healthcare waste. The Healthcare Waste Officer, working with other managers at the health facility are also responsible for coordinating healthcare waste and takes initiatives for safeguarding healthcare waste management. This is done while acknowledging multisectoral causes and consequences of health problems.

5.2 General objectives of the course

The overall objectives of this short course are to:

1. Train healthcare providers and handlers on safe and environmentally friendly Healthcare Waste Management (HCWM) practices and systems.
2. Ensure consistency with national standards and guidelines on Healthcare waste management.
3. Meet training needs in healthcare waste management especially for staff who did not receive training in HCWM

5.3 Specific objectives

At the end of this course participants/candidates should be able to:

1. Describe the importance of healthcare waste management in healthcare facilities.
2. Demonstrate knowledge gained to improve healthcare waste management within their facilities.
3. Train and support staff training activities in their health facilities.
4. Plan and budget for healthcare waste management activities in their strategic and annual action plans
5. Appreciate the benefits of non-incineration technologies over low temperature incineration.
6. Understand basic operation and maintenance of treatment technologies.
7. Implement health and safety measures to support HCWM.
8. Conduct monitoring of healthcare waste management activities at facility level.
9. Keep and maintain healthcare activity records related to their healthcare facility level

5.4 Training competences

After participating in this course, participants/ candidates should be able to effectively carryout the following tasks:

- Describes the importance of healthcare waste management in healthcare delivery.
- Applies and impacts the knowledge gained to improve healthcare waste management within their facilities.
- Trains and supports staff training activities in their health facilities.
- Plans and budgets for healthcare waste management activities in their facilities
- Appreciates the benefits of non-incineration technologies over low temperature incineration.
- Understands the basic operation and maintenance of the treatment technologies.
- Implements health and safety measures to support HCWM.
- Conducts monitoring of healthcare waste management activities at facility level.
- Keeps and maintains record of healthcare related activities at the facility level

5.5 Target Audience

The Basic Healthcare Waste Management course is designed for health personnel in healthcare facility overseeing healthcare waste management. The first course will comprise twenty (20) participants while subsequent courses are going to be determined by course management from among the following health professionals:

- Administrative personnel
- HCWM coordinators
- Facility managers
- Healthcare professionals
- Healthcare waste workers
- Facility support staff
- Environmental professionals
- Policy makers
- Other positions within the facility

5.6 General teaching approach

The course is aimed at providing participants with background knowledge and essential skills, enabling them to analyse their current practices, exchange experiences among each other and improve upon them. During the course interactive and participatory teaching methods will be used, based on the principles of adult education. Teachers will be asked to use as much as possible case studies, exercises and role-plays aimed at developing a critical and curious attitude. Participants will be continuously challenged to question the information offered to them. As these methods are crucial to the success of the course, special attention will be paid to the development of appropriate course material (case studies, exercises). Teachers may need support from the course management in developing teaching materials, which stimulate this attitude. The teachers will also be asked to involve experienced participants in the presentation and facilitation of the course, in order to use and build upon the experience present in class.

The training approach of the course adheres to the following principles:

- The starting point of any session will be the knowledge and experience of the participants. Most participants have been working already for some time as Healthcare Waste Officers;
- The training is problem oriented: the emphasis during the learning process is on how to deal with problems and how to solve problems.
- The approach is competency based: aimed at improving the practical skills of participants to implement and evaluate different approaches to solve health problems rather than just absorbing new facts and the ability to reproduce them.
- The emphasis is on the practical application of the course content. Additionally, participants will be asked to discuss and solve problems which are derived from real working situations, either from their own experience or those from the teachers.

5.7 Professional Trainer

The core team of master trainers will be those who received intensive training in content, effective teaching methods, evaluation tools, and Training of Trainers in Kenya. These comprise of six (6) Zambian officers who will include other complementary experts drawn from health/medical training institutions/organisations within Zambia. A one day ToT refresher workshop will be organized before start of the first course, in order to develop a common vision among trainers and course management on the teaching methods.

The topics taught in the course will apply integrated approach with a balance in classroom lectures, discussion and practical application in the field. During the entire teaching process a continuous link will be made between theoretical principles, best practices from elsewhere and opportunities for practical application within the health facility. The aim is to stimulate critical thinking about interventions and service delivery that are currently practiced in the field.

Although this course is not primarily meant to teach technical (medical) knowledge, technical inputs may be given to clarify and illustrate principles and control strategies when required. In addition, literature will also be present in the resource package so that participants who may need to update their technical knowledge will be able to do so.

6.0 COURSE OUTLINE

The duration for this course is three (3) days; the structure is essentially based on theory, which is intertwined with practical field visits. The duration for classroom sessions will be for two (2) days and these comprise; presentations, exchange and feedback on fieldwork tasks.

The participants during the course will acquaint with one another and they will be asked to reflect on their own roles/job descriptions, in an exercise to make them aware of their learning needs and roles.

6.1 General structure of the healthcare waste management course

Session Description	Duration in Minutes	General Content	Responsibility
Day One			
Introductions welcoming of participants	15	Pre-test	MoH Representative
Welcoming remarks	15		"
Objectives of Session and course expectations	30	Why are we here?	"
1. General Environmental	30	This session discusses in general healthcare waste as it affects the environment in relation to the natural cycle as it impacts on human health. It also discusses sources	Mrs. Florence Kabinga Mwale

and Waste Information		of health hazards that are associated with the healthcare waste stream.	
2. Basic Microbiology	45	This session discuss common pathogens (bacteria, viruses, fungi and parasite) that are commonly found in healthcare waste. It also provides various classes ad types of pathogens for easy understanding of pathogen that are mostly involved in Nosocomial Infection such as; Staphyloccocus (gram+), Enterobacter (gram-), and Pseudomonas (gram-).	Ms. Munyinda Nosiku
Break	**15**		
3. Risks from healthcare activities and wastes	45	Health workers may be exposed to hazardous chemicals during their work while in the case of patients this may occur during their treatment. This means that if hazardous healthcare waste is not properly disposed of, will result in waste handlers and the public being exposed which may lead into environmental contamination.	Ms. Perine Kasonde
4. Environmental Health – Infection control	45	Environmental Health and Infection Control discuss different routines of standard precautions that should be provided whenever providing care to patients. This is done in order to protect healthcare workers from contact with body fluids: blood, secretions, excretions, based on procedure and despite the patient's diagnosis, symptoms in order to minimize spread of infection to healthcare workers or other patients An effective method to prevent healthcare workers and others from getting an illness is to know the route of transmission, and take precautions to prevent the pathogen from being transmitted.	Mr. Brian Nkandu
5. Definition and Classification of Healthcare Wastes (WHO & ZEMA)	45	This session defines and classifies healthcare waste as non-hazardous general wastes (comparable to domestic wastes) and potentially hazardous waste (waste associated health risks). Since bulk of healthcare waste is general (non-hazardous) waste, participants will be introduce them to start thinking of the possibility of recycling general waste to minimize the impact on the environment, comparability with data from their own facilities and how to gather new information.	Mr. Sibu Bbuku
Lunch	**45**		
6. Definition and classification of waste	45	This session defines and classifies healthcare waste as non-hazardous general wastes (comparable to domestic wastes) and potentially hazardous waste (waste associated health risks). Since bulk of healthcare waste is general (non-hazardous) waste, participants will be introduce them to start thinking of the possibility of recycling general waste to minimize the impact on the environment, comparability with data from their own facilities and how to gather new information.	Mrs. Florence Kabinga Mwale
7. Segregation of healthcare wastes	45	Health-care facility managers have a responsibility to ensure that waste is kept under control at all times	Ms. Munyinda Nosiku

		within a health-care facility and disposed of safely either onsite or offsite. This Session discusses proper healthcare waste segregation, and demonstrate onsite storage, waste classifications, why waste segregation is important, colour-coding, and waste containers. It also provides a continuous sequence of safe keeping at each step in the process, from the point of generation of waste to its final treatment or disposal.	
Break	**30**		
8. storage and Management methods for different types of waste	60	The storage and management facilities for healthcare waste should fulfil relevant general requirements for most types of health-care facilities while taking into consideration amount of waste produced and needs central storage facilities. This is because storage of waste like; blood, radioactive substances, and chemicals may only be produced at large and specialized medical facilities.	Ms. Perine Kasonde
Day Two			
Recap	**15**		
9. Responsibilities for healthcare waste management	30	This session discusses responsibilities, duties, and codes of practice for each of the categories for personnel of the hospital who, through their daily work, will generate waste and be involved in the segregation, storage, and handling of the waste. It also clearly defines responsibilities of hospital attendants and ancillary staff involved in collecting and handling wastes where special practices are required, e.g. for radioactive waste or hazardous chemical waste	Mr. Brian Nkandu
10. Alternative Treatment Technologies	45	This session discusses different types of autoclaves that are being used to sterilize medical instruments and they have since been adapted for the treatment of healthcare waste. Removal of air from the autoclave is essential to ensure penetration of steam. Autoclaves are subcategorized according to the method of air removal as gravity displacement autoclaves, pre-vacuum or high vacuum autoclaves, and pressure pulse autoclaves.	Mr. Sibu Bbuku
Break	**15**		
11. Sharps: Handling & Mitigation Measures	45	This session defines sharps and other medical instruments that are necessary for carrying out healthcare work and could cause an injury by cutting or pricking the skin. This includes immunization practice that puts all healthcare workers at risk as 37% of hepatitis infections among them come from occupational exposure. Thus as a result workers needs to be protected from infections like HBV by receiving immunization early in their careers.	Mrs. Florence Kabinga Mwale
12. External transportation of healthcare waste	45	The transport services onsite should take place during less busy hours while at the same time, hazardous and non-hazardous waste should always be transported separately. Offsite transportation of hazardous health-	Ms. Munyinda Nosiku

		care waste should comply with Zambian regulations/guidelines.	
13. Introduction to WASH-FIT Methodology	45	This session discusses 4 main domains (water, sanitation, hygiene and management) for assessing WASH FIT. The risk assessment also demonstrates that it can be done either as group work/team to produce responses which are agreed collectively or on an individual basis. This methodology at all levels of the health facility demands that everyone is involved.	Ms. Perine Kasonde
Lunch	**60**		
14. Mercury Spill management in healthcare facilities	45	This session discusses hazards associated with mercury spill. Mercury is used in several medical devices and if not separated might be set free into wastewater. Mercury wastes are generated by spillage from broken clinical equipment and should be recovered immediately to avoid spilt drops entry into wastewater through drains because it is environmentally persistent and bio-accumulates in the food chain.	Mr. Brian Nkandu
15. Sanitation	60	This session discusses minimum requirements for sanitation on how to share knowledge and skills that are designed to improve sanitation services in healthcare facilities. This also includes usage and maintenance of sanitation facilities in healthcare facilities	Mr. Sibu Bbuku
16. Occupational Health and Safety	45	Health-care waste should be considered as a reservoir of pathogenic microorganisms, which can cause contamination and give rise to infection if waste is not managed properly. Workers at risk include health-care providers, hospital cleaners, maintenance workers, operators of waste treatment equipment, and all operators involved in waste handling and disposal within and outside health-care establishments. This calls upon individuals responsible for management of health-care waste ensure risks are identified and suitable protection is provided.	Mrs. Florence Kabinga Mwale
Break	**15**		
17. International Conventions and National HCWM laws	60	This session has been designed for participants to compare their facilities to specific international, national, and local laws, regulations and guidelines for HCWM. It also discusses how to address possible gaps or inconsistencies that may exist.	Ms. Munyinda Nosiku
Day Three			
Recap	**30**		
18. Introduction to Individualized Rapid Assessment Tool (I- RAT)	60	This rapid assessment tool is a part of an overall strategy developed by WHO which aims at reducing the disease burden caused by poor healthcare waste management (HCWM) through the promotion of best practices and the development of safety standards.	Ms. Perine Kasonde
19. Individualized Rapid	165	This session provides practical exercise on how to conduct Individualized Rapid Assessment Tool (I-	Mr. Brian Nkandu

Assessment Tool (I-RAT) Practical		RAT) at a health facility. This provides hands-on practical exercise for easy understanding the tools that will be used in the fields of operation while taking into consideration issues to be considered in the feedback.	
IRAT feedback	120	Practical	Mr. Sibu Bbuku
Break	**15**		
20. Gender Equality and Human Rights Mainstreaming in Healthcare Waste Management	45	This session looks at gendered and other social differences that make men, women, children and other groups vulnerable to infections from healthcare waste in different ways and further increase or decrease their capacity and knowledge for protection. Most of the information is derived from the social and environmental injustice assessment and analysis, including gender dimensions in healthcare waste management.	Mr Allan Mbewe
21. Healthcare Waste Management Planning	45	This session is designed to improve infection control and increase the health-care waste-management options. The plan cover issues related to: location and organization of segregation, collection, transport and storage facilities; design/performance specifications, required material and human resources, responsibilities, procedures and practices, and monitoring and training.	Mrs. Florence Kabinga Mwale
Lunch	**60**		
22. Financing Healthcare Waste Management in budgeting	45	This session discusses allocation of financial resources to ensure proper management of HCW that has an even greater financial cost on the medium-long run in terms of morbidity and mortality and as well as environmental damage that will impact negatively on peoples' health in the end. This is because of the reasons that surrounds invest in HCWM which depends on ethical, legal and financial considerations.	Ms. Munyinda Nosiku
Break	**30**		
End of the course	15	Wrap up and Evaluation	Mrs. Florence Kabinga Mwale
Total duration	1530 min (25.50 hr)	Total duration includes travel to and from workshop venue	

7.0 DESCRIPTION OF THE SESSION

7.1 DAY ONE

Session 1: General environmental and waste information

Estimated Time	30 minutes
Session overview	This Session discusses in general healthcare waste as it affects the environment in relation to the natural cycle as it impacts on human health. It also discusses sources of health hazards that are associated with the healthcare waste stream.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Explain the natural cycle of the environment 2. Explain the impact of natural cycle on human health 3. Identify sources of health hazards associated with the waste stream
Content	1. Natural circle of the environment 2. Hazardous substances in the natural circles 3. Health hazards, sources: e.g. Mercury in the food chain 4. Waste streams in the daily environment 5. Hazardous waste
Teaching methods	• Lecture • Group discussions • Demonstration
Assessment method	Oral questions and answers
Materials Needed	• Sly Video on environmental health:- Save live: clean your hands (day 1) • Simulations • Practical demonstrations/Role play • Focus Group Discussions
Student References	1. International Centre for Journalism. Medical Waste Recycling: Uncovering a Lucrative Trade (video). 2009 http://www.icfj.org/content/medical-waste-recycling-uncovering-lucrative-trade 2. World Health Organization, 2006. Management of Waste from Injection Activities at District Level: Guidelines for District Health Managers. http://www.who.int/water_sanitation_health/medicalwaste/mwinjections.pdf

Session 2: Basics Microbiology

Estimated Time	30 Minutes
Session overview	This Session discuss common pathogens (bacteria, viruses, fungi and parasite) that are commonly found in healthcare waste. It also provides various classes ad types of pathogens for easy understanding of pathogen that are mostly involved in Nosocomial Infection such as; Staphyloccocus (gram+), Enterobacter (gram-), and Pseudomonas (gram-).
Learning Objectives	At the end of presentation, participants will be able to: 1. Describe classes of pathogen 2. Identify pathogen that are mostly involved in Nosocomial Infection (NI)
Content	1. Definitions 2. Classes of Pathogens: Bacteria, viruses, fungi and parasite 3. Pathogen and Nosocomial Infections (NI): Staphyloccocus (gram+), Enterobacter (gram-) and Pseudomonas
Teaching methods	• Lectures • Questions and answers • Group discussions
Assessment method	Oral questions and answers
Materials Needed	• LCD / Projector • Sky video - Save live: clean your hands • Simulations • Exercises
Student References	1. Blue Book, chapter 2, 3 2. World Health Organization, Salkin, Ira F. Review of Health Impacts from Microbiological Hazards in Healthcare Wastes, 2004. http://www.who.int/water_sanitation_health/medicalwaste/en/microbhazards0306.pdf

Session 3: Risks from healthcare activities and wastes - infectious, neurotoxic, ergonomic

Estimated Time	30 minutes
Session overview	Health workers may be exposed to hazardous chemicals during their work while in the case of patients this may occur during their treatment. This means that if hazardous healthcare waste is not properly disposed of, will result in waste handlers and the public being exposed which may lead into environmental contamination.
Learning Objectives	By the end of this presentation, the participant will be able to: 1. Describe general principles of threats from handling and transportation of medical waste 2. Describe waste management generated in a health facility in relation to risks from poor transport, handling and reuse of medical devices 3. Identify risks to human health associated with exposure to hazardous chemicals 4. Describe the importance of healthcare waste management to human health and the environment 5. Demonstrate the process involved in healthcare waste risk assessment
Content	1. General Principles of healthcare waste: Threats from medical waste, risks from poor transport and handling 2. Waste Management: Waste produced in a hospital, Risks from poor transport and handling, Reuse of medical devices 3. Hazardous chemicals exposure: Zinc, Mercury, Glutaraldehyde health effects, Impacts of pharmaceuticals 4. Healthcare waste management: a human rights issue, and dioxins 5. Environment and mortality: Health impact of pollution, dioxins from medical waste incineration in the food chain, mercury medical device manufacturing, PVC, and pharmaceutical waste
Teaching methods	• Lectures • Exercises • Practical demonstrations / Role play • Group discussions
Assessment method	Oral questions and answers
Materials Needed	• LCD / Projector • WS 1: Risk assessment including limited report back
Student References	1. World Health Organization, 2006. Management of Waste from Injection Activities at District Level: Guidelines for District Health Managers. http://www.who.int/water_sanitation_health/medicalwaste/mwinjections.pdf 2. Wilburn, S., Eijkemans G. Preventing Needle stick Injuries Among Healthcare Workers. Int. J. Occup. Environ. Health, 2004, vol. 10. 451-456 http://www.who.int/occupational_health/activities/5prevent.pdf

Session 4: Environmental Health & Infection Control

Estimated Time	30 minutes
Session overview	Environmental Health and Infection Control discuss different routines of standard precautions that should be provided whenever providing care to patients. This is done in order to protect healthcare workers from contact with body fluids: blood, secretions, excretions, based on procedure and despite the patient's diagnosis, symptoms in order to minimize spread of infection to healthcare workers or other patients An effective method to prevent healthcare workers and others from getting an illness is to know the route of transmission, and take precautions to prevent the pathogen from being transmitted.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Explain the meaning of Environmental Health & Infection Control 2. Explain the meaning of Standard Precautions 3. List the main elements of Standard Precautions
Content	1. Introduction to environmental health (EH) 2. EH for healthcare facilities 3. Infection prevention and control (IPC) general information 4. The Disease Transmission Cycle: The Task, and Infection Control (IC) 5. Source of infection in healthcare setting: Use standard precautions for avoid risky environments! 6. Standard precautions in healthcare
Teaching methods	• Lectures • Group discussions • 3. Demonstration
Assessment method	Oral questions and answers
Materials Needed	• LCD / Projector
Student References	1. Blue Book, chapter 2, 3 2. Wilburn, S., Eijkemans G. Preventing Needle stick Injuries Among Healthcare Workers. Int. J. Occup. Environ. Health, 2004, vol. 10. 451-456 http://www.who.int/occupational_health/activities/5prevent.pdf 3. Prüss-Üstün, Rapiti & Hutin, 2003. Estimation of the Global Burden of Disease Attributable to Contaminated Sharps Injuries Among Health-care Workers. http://www.who.int/quantifying_ehimpacts/global/7sharps.pdf

Session 5: Definition and Classification of Healthcare Wastes (WHO & ZEMA)

Estimated Time	30 minutes
Session overview	This Session defines and classifies healthcare waste as non-hazardous general wastes (comparable to domestic wastes) and potentially hazardous waste (waste associated health risks). Since bulk of healthcare waste is general (non-hazardous) waste, participants will be introduce them to start thinking of the possibility of recycling general waste to minimize the impact on the environment, comparability with data from their own facilities and how to gather new information.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Define healthcare waste: WHO and Zambia Environmental Management Agency (ZEMA) 2. Describe sources and examples of healthcare waste 3. Describe general characteristics of healthcare waste 4. Provide examples of different classifications of healthcare waste
Content	1. Definition of Healthcare Waste 2. Sources of Healthcare Waste 3. General Types of Healthcare Waste 4. Categories of Healthcare Waste 5. WHO Waste Classifications 6. Waste Classifications: Infectious wastes, chemical wastes, pharmaceutical wastes, radioactive wastes, and non-hazardous general waste 7. General Wastes 8. Waste Segregation 9. General Principles: Colour coding for bags and containers, safety boxes
Teaching methods	• Lectures case studies • Simulations • Practical exercises • Focus Group discussions
Assessment method	Oral questions and answers Review Questions
Materials Needed	• LCD/Projector • Practical demonstrations / Role play
Student References	1. Read Chapters 2 and 3 in Blue Book 2. The Environmental Management Act No. 12 of 2011. The Environmental Management (Licencing) Regulations, 2013. SI No. 112 of 2013

Session 6: Classification and Generation Rates of Healthcare Waste

Estimated Time	45 minutes
Session overview	Health-care facility managers have a responsibility to ensure that waste is kept under control at all times within a health-care facility and disposed of safely either onsite or offsite. This Session discusses proper healthcare waste segregation, and demonstrates onsite storage, waste classifications, why waste segregation is important, colour-coding, and waste containers. It also provides a continuous sequence of safe keeping at each step in the process, from the point of generation of waste to its final treatment or disposal.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Explain why segregation is important 2. Demonstrate segregation of healthcare waste 3. Discuss acceptable options for commercial colour-coded bags and sharps containers 4. Create informational posters and signs specific to waste segregation
Content	1. General Principles: Why Segregate Healthcare Waste; Review of Waste Classifications 2. Waste Segregation: WHO-Recommended Segregation Scheme; Example of a More Complex Segregation Scheme 3. Specifications and Alternatives: Low-Resource Settings; Containers for Waste Collection; Health post segregation stand; Treatment trolley with needle cutter and segregation bins; Sharps Containers; Needle cutters and destroyers; and Reusable high capacity sharps bins 4. Colour Coding for Bags and Containers: Bags for Waste Collection; Safety Boxes; Where Do You Place Bins?; Problems of Segregation; Dealing With Segregation Errors; Educational Segregation Poster; and Multi lingual and pictorial signage
Teaching methods	• Lectures case studies • Segregation quiz (day 7) • Simulations • Practical exercises • Focus Group discussions
Assessment method	Oral questions and answers Review Questions
Materials Needed	• LCD/Projector • Practical demonstrations / Role play
Student References	1. Blue Book Chapter 7 2. GEF3 Project-Green Hospitals. Mod 9 & 10 *3.* Kwakye G, Pronovost PJ, Makary MA. Commentary: *A call to go green in healthcare by reprocessing medical equipment*. Acad Med. 2010;85(3):398–400

Session 7: Segregation of Healthcare Wastes

Estimated Time	45 minutes
Session overview	This session provides an opportunity for the participant to review waste classifications and describe why waste segregation is important at health facility level and general public engaged in waste picking. It also describes color-coding of waste containers in detail in addition to demonstration of segregation process of healthcare waste
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Explain why segregation is important 2. Demonstrate segregation of healthcare waste 3. Discuss acceptable options for commercial color-coded bags and sharps containers 4. Create informational posters and signs specific to waste segregation
Content	1. General principles: why segregate healthcare waste?; and review of waste classifications 2. Waste Segregation 3. WHO-Recommended segregation scheme: example of a more complex segregation scheme; minimum level of segregation recommended by who; specifications and alternatives for low-resource settings 4. Containers for waste collection: health post segregation stand; and reusable high capacity sharps bins 5. Potential for job creation 6. Colour coding for bags and containers: bags for waste collection; safety boxes; and where do you place bins? 7. Problems of segregation: dealing with segregation errors; sample of an educational segregation poster; and multi lingual and pictorial signage
Teaching methods	• Lectures • Workshop 2 segregation quiz Exercises • WS segregation ‘a’ and ‘b’
Assessment method	Oral questions and answers
Materials Needed	• LCD/Projector • Flip chart and marker pens and/or board and chalk
Student References	1.

Session 8: Storage and management at central facilities for different types of waste

Estimated Time	60 minutes
Session overview	The storage and management facilities for healthcare waste should fulfil relevant general requirements for most types of health-care facilities while taking into consideration amount of waste produced and needs central storage facilities. This is because storage of waste like; blood, radioactive substances, and chemicals may only be produced at large and specialized medical facilities.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Discuss various waste reception procedures for waste treatment facilities in relation to their reporting duties 2. Conduct visual inspections for healthcare waste 3. Discuss reporting requirements for information on the origin, waste generation and quality of waste segregation 4. Assess the waste contents in order to prevent possible damage of the treatment equipment.
Content	1. Introduction 2. Waste reception procedures 3. Reporting requirements 4. General Requirements for Central Storage Areas
Teaching methods	• Lectures • Simulations • Exercises • Focus Group discussions
Assessment method	Oral questions and answers
Materials Needed	• Projector/LCD • Practical demonstrations/Role play • WS 2 operation and management *at central facilities*
Student References	1. Blue Book *2.* Operation and monitoring guidelines- Healthcare Waste Treatment Centre - GEF

7.2 DAY TWO

Session 9: Roles and responsibilities for healthcare waste management

Estimated Time	15 Minutes
Session overview	This Session discusses responsibilities, duties, and codes of practice for each of the categories for personnel of the hospital who, through their daily work, will generate waste and be involved in the segregation, storage, and handling of the waste. It also clearly defines responsibilities of hospital attendants and ancillary staff involved in collecting and handling wastes where special practices are required, e.g. for radioactive waste or hazardous chemical waste
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Describe HCWM management 2. Explain Typical Waste Management Structure in a hospital setting 3. Explain a typical waste management team at a hospital/ health facility 4. Outline various responsibilities for the waste management team
Content	1. HCWM management 2. Typical Waste Management Structure 3. Waste Management Team 4. Overall committee responsibilities: Head / Medical superintendent of hospital responsibilities; Waste management officer responsibilities; Infection control office responsibilities; Chief pharmacist/radiation officer responsibilities; Procurement officer responsibilities; Hospital administrator/engineer responsibilities; Waste Management Team
Teaching methods	• Lectures • Focus Group discussions
Assessment method	Oral questions and answers
Materials Needed	• Projector/LCD
Student References	1. WS 2 Operation and management of central facilities 2. Blue Book

Session 10: Alternative Treatment Technologies

Estimated Time	30 minutes
Session overview	This session discusses different types of autoclaves that are being used to sterilize medical instruments and they have since been adapted for the treatment of healthcare waste. Removal of air from the autoclave is essential to ensure penetration of steam. Autoclaves are subcategorized according to the method of air removal as gravity displacement autoclaves, pre-vacuum or high vacuum autoclaves, and pressure pulse autoclaves.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Learn about the different types of waste treatment technology 2. Discuss the factors to consider in the selection of treatment technologies 3. Know where to look for information about treatment technologies and where to purchase them
Content	A. Non-incineration technologies: 1. Low-heat thermal processes: Autoclave, Microwave, Frictional heat systems, Dry heat technology, Effluent decontamination systems, and Incineration (Costs for incinerators that meet international standards, e.g. high temperature, dual chamber incinerators with air pollution controls) 2. Chemical processes: Reagents to denature cytostatics, UNDP GEF project Argentina Technology Development Component, Alkaline hydrolysis/ tissue digester, Alkaline hydrolysis 3. Biological processes: Organic waste treatment, Biodigestion, Biodigester design, 4. Mechanical processes: Shredding, Benefits of needle cutters, Encapsulation, Disinfection Technology Comparisons 5. Technology choice- key resources B. Autoclaves and Co – way of working: 6. Steam treatment systems, Pressure cooker, Gravity flow autoclave, Pre-Vacuum autoclave, and Pulsed autoclave 7. Operation of steam treatment system 8. Loading and Unloading of autoclaves 9. Fractionated pre-vacuum autoclaves
Teaching methods	• Lectures • Simulations • Exercises • Focus/Group discussions • Practical demonstrations/Role play
Assessment method	Oral questions and answers
Materials Needed	• LCD / Projector • Video on Autoclave treatment
Student References	1. Blue Book, chapter 8 and Centre - GEF 2. Operation and monitoring guidelines- Healthcare Waste Treatment

Session11: Sharps - Handling and Mitigation Measures

Estimated Time	30 minutes
Session overview	This Session defines sharps and other medical instruments that are necessary for carrying out healthcare work and could cause an injury by cutting or pricking the skin. This includes immunization practice that puts all healthcare workers at risk as 37% of hepatitis infections among them come from occupational exposure. Thus as a result workers needs to be protected from infections like HBV by receiving immunization early in their careers.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Describe precautionary principles that deal with sharps in the prevention sharp injuries 2. Explain elements of post exposure management from a needle stick injury 3. Discuss measures to be taken in handling sharps 4. Discuss mitigation measures against sharps in an event of a needle stick injury
Content	1. Introduction 2. Background 3. Mitigation measures: Safer design, collection containers, training, PPE, and vaccination/ immunization 4. Post exposure management 5. Disposal measures of sharps 6. Recording sharps incidents 7. Disposal
Teaching methods	• Lectures • Simulations • Demonstrations • Practical • Focus /Group discussions
Assessment method	Oral questions and answers
Materials Needed	• LCD / Projector • Video play on Sharps and other devices • WS 3: Sharp Incident – Hand-out for Training Participants • Reporting Sharp Incident form
Student References	1. Blue Book, chapter 2, 8, 12 2. Wilburn, S., Eijkemans G. Preventing Needle stick Injuries among Healthcare Workers. Int. J. Occup. Environ. Health, 2004, vol. 10. 451-456 http://www.who.int/occupational_health/activities/5prevent.pdf 3. Prüss-Üstün, Rapiti & Hutin, 2003. Estimation of the Global Burden of Disease Attributable to Contaminated Sharps Injuries among Health-care Workers. http://www.who.int/quantifying_ehimpacts/global/7sharps.pdf

Session12: External transportation of healthcare waste

Estimated Time	30 minutes
Session overview	The transport services onsite should take place during less busy hours while at the same time, hazardous and non-hazardous waste should always be transported separately. Offsite transportation of hazardous health-care waste should comply with Zambian regulations/guidelines.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Overview of Legislation for transporting waste on the road 2. Introduction to the ADR Regulations 3. Classification of Dangerous goods 4. Introduction to Class 6.2 Infectious Substances 5. Introduction to UN 3291 Infectious Healthcare Waste 6. Demonstrate removal of mercury spillages
Content	1. Waste Transport Regulations 2. Introduction to the ADR Regulations 3. Classification of Dangerous Goods: Infectious Substances; UN Numbers and Proper Shipping Names 4. Categorisation Scheme: Category A; Category B; Cultures & Stocks; Exemptions; Package marking and Labelling 5. ADR General Requirements: Vehicle Markings; Documentation; and Drivers Checklist
Teaching methods	• Lectures • Focus/Group discussions • Practical demonstrations / Role play • Simulations • Exercises
Assessment method	Oral questions and answers
Materials Needed	• LCD / Projector • Video Mercury spill management in health facilities (day 3) • Work shop 19. Mercury spillage (day 3)
Student References	1. GEF 3 2. Wilburn, S., Eijkemans G. Preventing Needle stick Injuries among Healthcare Workers. Int. J. Occup. Environ. Health, 2004, vol. 10. 451-456 http://www.who.int/occupational_health/activities/5prevent.pdf

Session 13: Introduction to Water and Sanitation for Health Facility Improvement tool (WASH FIT) Methodology (in class).

Estimated Time	60 minutes
Session overview	This Session discusses 4 main domains (water, sanitation, hygiene and management) for assessing WASH FIT. The risk assessment also demonstrate that it can be done either as group work/team to produce responses which are agreed collectively or on an individual basis. This methodology at all levels of the health facility demands that everyone is involved.
Learning Objectives	At the end of the session, participants should be able to: 1. Explain use of WASH FIT methodology vs. global monitoring 2. Identify types of facilities meant for WASH FIT 3. Explain benefits of implementing WASH FIT methodology 4. Discuss the WASH FIT Methodology 5. Explain the four main WASH FIT domains 6. Conduct facility assessment 7. Develop Implementation plan
Content	1. Use of WASH FIT methodology 2. Types of facilities meant for WASH FIT 3. Benefits of implementing WASH FIT methodology 4. The four main WASH FIT domains 5. Conduct facility assessment 6. Develop Implementation plan 7. Latrine is blocked and unusable 8. Risk of infection
Teaching methods	• Lectures • Simulations • Exercises • Focus/Group Discussions
Assessment method	Oral questions and answers
Materials Needed	• Projector/LCD • Practical demonstrations / Role play • Tools (WASH FIT)(Indicator assessment)
Student References	1. WHO (2008). Essential environmental health standards in health care. http://www.who.int/water_sanitation_health/hygiene/settings/ehs_hc/en/ 2. WHO (2015). Sanitation safety planning: manual for safe use and disposal of wastewater, greywater and excreta. *http://www.who.int/water_sanitation_health/publications/ssp-manual/en/*

Session 14: Mercury Spill management in healthcare facilities

Estimated Time	15 Minutes
Session overview	This session discusses hazards associated with mercury spill. Mercury is used in several medical devices and if not separated might be set free into wastewater. Mercury wastes are generated by spillage from broken clinical equipment and should be recovered immediately to avoid spilt drops entry into wastewater through drains because it is environmentally persistent and bio-accumulates in the food chain.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Manage small to large scale mercury spill at a healthcare facility 2. Describe step-by-step clean up procedure for a small mercury spill 3. Develop waste handling and storage procedures
Content	1. Small – large spill 2. General: Mercury Spill Kits 3. Managing a Small Mercury Spill 4. Procedure to clean up a small mercury spill 5. What NOT to do during a mercury spill
Teaching methods	• Lectures • Exercises • 3. Case studies
Assessment method	Oral questions and answers
Materials Needed	• LCD/Projector • WS 4 Mercury spillage • Thermometers fact sheet
Student References	1. WHO (2005). *Mercury in health care*. Policy paper. Geneva, World Health Organization Department of Protection of the Human Environment. 2. Washington Toxics Coalition: Mercury Thermometers Fact Sheet. May 2002 http://watoxics.org/files/mercury-thermometers 3. The Environmental Management Act No. 12 of 2011. The Environmental Management (Licencing) Regulations, 2013. SI No. 112 of 2013 4. Blue Book, Chapter 4

Session 15: Sanitation

Estimated Time	45 minutes
Session overview	This Session discusses minimum requirements for sanitation on how to share knowledge and skills that are designed to improve sanitation services in healthcare facilities. This also includes usage and maintenance of sanitation facilities in healthcare facilities
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Discuss the importance of safe handling and disposal of sanitation 2. Explain global sanitation standards, requirements and cleanliness 3. Describe management and maintenance of sanitation facilities 4. Outline WASH FIT sanitation indicators
Content	1. Importance of safe sanitation; Sanitation Aspects 2. Global Sanitation Standards; Sanitation requirements 3. Management and maintenance of sanitation facilities: 4. WASH FIT sanitation indicators
Teaching methods	• Lectures • Simulations • Exercises • Practical demonstrations / Role play • Focus/Group discussions
Assessment method	Oral questions and answers
Materials Needed	• Projector/LCD
Student References	1. WHO (2015). Sanitation safety planning: manual for safe use and disposal of wastewater, greywater and excreta. *http://www.who.int/water_sanitation_health/publications/ssp-manual/en/* 2. WHO (2008). Essential environmental health standards in health care. http://www.who.int/water_sanitation_health/hygiene/settings/ehs_hc/en/ 3. WHO/UNICEF (2015). Water, sanitation and hygiene in healthcare facilities: Status in low-and middle-income countries and way forward. *http://www.who.int/water_sanitation_health/publications/wash-health-care-facilities/en/* 4. Swedish Red Cross (Ed.) (2008): Slide show of Swedish Red Cross water and sanitation Session 4O ERU deployed in Philippines. Stockholm: Swedish Red Cross. URL: *http://www.ifrc.org/Global/sw-watsan-eru-philippines0808.pdf [Accessed: 20.03.2015].* 5. Peal, Andy; Evans, Barbara; Van der Voorden, Calolin (2010): Hygiene and Sanitation Software: An Overview of Approaches. Geneva: Water Supply & Sanitation Collaborative Council

Session 16: Occupational health and safety with first aid measures

Estimated Time	45 Minutes
Session overview	Health-care waste should be considered as a reservoir of pathogenic microorganisms, which can cause contamination and give rise to infection if waste is not managed properly. Workers at risk include health-care providers, hospital cleaners, maintenance workers, operators of waste treatment equipment, and all operators involved in waste handling and disposal within and outside health-care establishments. These calls upon individuals responsible for management of health-care waste ensure risks are identified and suitable protection is provided.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Identify workplace hazards and who is at risk 2. Apply the hierarchy of controls to reduce or eliminate risk 3. Demonstrate proper hand hygiene 4. Discuss use and limitations of personal protective equipment 5. Demonstrate the proper donning and removal of personal protective equipment 6. Discuss the functions of an occupational health and safety committee
Content	1. Principles of Worker Health and Safety; Healthcare is Hazardous to Workers 2. Hierarchy of Controls: In Order From Most to Least Effective 3. Occupational Health Program: Training, Handling Sharps Containers, Handling Contaminated Linen, Handling of Cytotoxic Waste, 4. Personal Hygiene: Gloves, Safety Glasses, Goggles and Face Shields, Coveralls and Aprons, Shoes, Sequence of Donning PPE, Sequence of Removing PPE 5. Immunization; Incident Report 6. Medical Surveillance: Fire Safety, Importance of an OHS committee, Reasons to Eliminate Glutaraldehyde, Reasons to Eliminate: Ethylene Oxide (EO), Alternatives to Ethylene Oxide, Safety Data Sheet "Quick Look" and Latex Allergy
Teaching methods	• Lectures • Simulations • Exercises • Practical demonstrations / Role play • Focus/Group Discussions
Assessment method	Oral questions and answers
Materials Needed	• LCD / Projector
Student References	1. Blue Book, chapter 11 2. Wilburn, S., Eijkemans G. Preventing Needle stick Injuries among Healthcare Workers. Int. J. Occup. Environ. Health, 2004, vol. 10. 451-456 http://www.who.int/occupational_health/activities/5prevent.pdf

Session 17: International Conventions and National HCWM Laws MEA and Conventions

Estimated Time	105 minutes
Session overview	This Session has been designed for participants to compare their facilities to specific international, national, and local laws, regulations and guidelines for HCWM. It also discusses how to possibly address gaps or inconsistencies that may exist.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Review the Minamata Convention on Mercury and specify the requirements for mercury elimination in healthcare settings 2. Describe the role of the health sector in the adoption and implementation of the Minamata Convention on Mercury 3. Identify resources to assist Ministries of Health with implementation 4. Understand basic environmental guiding principles of waste management 5. Understand purpose of Stockholm and Basel conventions 6. Understand the structure and provisions of Zambian laws and regulations specific to HCWM and how they apply to your facility
Content	1. Minamata Convention on Mercury; Mercury (Hg)– a potent neurotoxicant 2. WHO guidance: developing a national strategies to phase out mercury thermometers and sphygmomanometers; and Resources on Mercury 3. Basel and Stockholm Conventions: Introduce basic environmental principles, and Guiding principles of waste management 4. World Health Organization's policy and the core principles for achieving safe and sustainable management of healthcare waste 5. The country's obligations under the Basel and Stockholm Conventions as they relate to healthcare waste management (HCWM) 6. National HCWM laws and regulations
Teaching methods	• Lectures • Exercises • 3. Case studies
Assessment method	Oral questions and answers
Materials Needed	• LCD/Projector • Student hand-outs: slides, exercise, homework • Flip chart and marker pens and/or board and chalk • Local legal standard: ➢ The Environmental Management Act No. 12 of 2011. ➢ The Environmental Management (Licencing) Regulations, 2013. SI No. 112 of 2013
Student References	1. The Environmental Management Act No. 12 of 2011. The Environmental Management (Licencing) Regulations, 2013. SI No. 112 of 2013 2. Blue Book, Chapter 4

7.3 DAY THREE

Session 18: Introduction to Individualized Rapid Assessment Tool (I-RAT)

Estimated Time	45 Minutes
Session overview	This rapid assessment tool is a part of an overall strategy developed by WHO which aims at reducing the disease burden caused by poor healthcare waste management (HCWM) through the promotion of best practices and the development of safety standards.
Learning Objectives	At the end of the session, participants should be able to: 1. Know the purpose of monitoring 2. Understand continuous quality improvement 3. Consider areas for monitoring 4. Identify those responsible for monitoring 5. Discuss how to respond to monitoring data
Content	1. Introduction to I-RAT ➢ Principles of continuous quality improvement (CQI) / Potential for Improvement ➢ Applying CQI to HCWM ➢ Areas to consider for CQI 2. Monitoring tools ➢ Overview: I-RAT, Baseline assessment, HCWH daily monitoring tools, Hippocrates; and WHO costing tools ➢ I-RAT categories of questions ➢ Costing tool to estimate capital, operating, and maintenance costs for HCWM
Teaching methods	• Lectures • Simulations • Exercises • Focus/Group discussions • Practical demonstrations / Role play
Assessment method	Oral questions and answers
Materials Needed	• Checklist – Sample inspection checklist site visit. • Projector/LCD
Student References	1. GEF3 2. Ministry of Health (2015). National Health-Care Waste Management Plan 2015 – 2019. Lusaka. MoH Publication 3. Peal, Andy; Evans, Barbara; Van der Voorden, Calolin (2010): Hygiene and Sanitation Software: An Overview of Approaches. Geneva: Water Supply & Sanitation Collaborative Council

Session 19: Individualized Rapid Assessment Tool (I-RAT) Practical

Estimated Time	60 minutes
Session overview	This Session provides practical exercise on how to conduct Individualized Rapid Assessment Tool (I-RAT) at a health facility. This provides hands-on practical exercise for easy understanding the tools that will be used in the fields of operation while taking into consideration issues to be considered in the feedback.
Learning Objectives	At the end of the session, participants should be able to: 1. List issues to be considered in the feedback 2. Conduct assessment of a healthcare waste system by visiting a healthcare facility or a waste treatment facility
Content	1. Conduct assessment of a healthcare waste system 2. Complete the I-RAT form 3. Organize notes from the visit to include: ➢ How the facility classifies and segregates, handles and collects, transports, stores, and disposes of healthcare waste ➢ Observes control strategies for reducing exposure to workers, training programs etc. 4. Prioritize areas for improvement 5. Participants may prepare questions based on facility and areas they will be visiting.
Teaching methods	• Focus/Group discussions • Simulations • Exercises • Practical demonstrations / Role play
Assessment method	Questions and answers Group feedback
Materials Needed	• Projector/LCD
Student References	1. GEF3 2. Ministry of Health (2015). National Health-Care Waste Management Plan 2015 – 2019. Lusaka. MoH Publication 3. Peal, Andy; Evans, Barbara; Van der Voorden, Calolin (2010): Hygiene and Sanitation Software: An Overview of Approaches. Geneva: Water Supply & Sanitation Collaborative Council

Session 20: Gender Equality and Human Rights Mainstreaming in Healthcare Waste Management

Estimated Time	45 minutes
Session overview	This session looks at gendered and other social differences that make men, women, children and other groups vulnerable to infections from healthcare waste in different ways and further increase or decrease their capacity and knowledge for protection. Most of the information is derived from the social and environmental injustice assessment and analysis, including gender dimensions in healthcare waste management.
Learning Objectives	At the end of this presentation, participant will be able to: 1. Provide basic knowledge on gender equality and human rights mainstreaming in healthcare waste management 2. Train skills in analyzing problems in relation gender equality and human rights mainstreaming in healthcare waste management (with a case study from Ghana) 3. Provide some ideas on how to mainstream gender equality and human rights concerns in healthcare waste management project implementation (with reference to Ghana) 4. Provide basic exercises
Content	The module is divided into five major sections as shown below: 1. Understanding core themes: • Gender equality and human rights mainstreaming • Healthcare waste management issues • Gender equality and human rights issues in healthcare waste management 2. Gender equality and human rights mainstreaming in the healthcare waste management project implementation • Barriers to involvement • Training and extension: 3. Exercises
Teaching methods	• Lecture • Group discussions • Demonstration
Assessment method	• Oral questions and answers
Materials Needed	• Projector • Colour paper and pen, • Tape • Envelopes or paper or plastic bags • Tokens (beans, stones, or other voting materials) • Power point • Flip chart • Cards

	• Newsprint • Markers
Student References	1. Gender Dimensions of Hazardous Chemicals and Waste policies under the Basel, Rotterdam, and Stockholm Conventions, Case Studies from Nigeria and Indonesia, 2017. 2. McGuire, Geraldine. 2003. Environmental Impacts of Mining on Women in Indonesian and Northern Australia, Melbourne, World Bank. 3. Yokoyama, Hisashi. 2018. Mercury Pollution in Minamata, Springer Briefs in Environmental Science. http://www.who.int/water_sanitation_health/medicalwaste/mwinjections.pdf 4. https://www.forestresearch.gov.uk/tools-and-resources/urban-regeneration-and-greenspace-partnership/greenspace-in-practice/practical-considerations-and-challenges-to-greenspace/social-and-environmental-justice/ 5. Mainstreaming gender at the GEF, Global Environment Facility, 2013.

Session 21: National Healthcare Waste Management Planning

Estimated Time	45 minutes
Session overview	This session is designed to improve infection control and increase the health-care waste-management options. The plan cover issues related to: location and organization of segregation, collection, transport and storage facilities; design/performance specifications, required material and human resources, responsibilities, procedures and practices, and monitoring and training.
Learning Objectives	At the end of this presentation, the participant will be able to: 1. Discuss characterization of main waste streams in relation to infectious waste, chemical & pharmaceutical waste, pathological waste, and other hazardous waste 2. Describe what is meant by weight versus Volume 3. Identify strategy development points to obey in relation to costs, logistic aspects and others 4. Describe waste stream strategy 5. Discuss issues for decision making process in; pharmaceutical and chemical, possible chemical logistic strategy; and pathological waste
Content	1. Introduction: What do we want 2. Characterization main waste streams: ➢ Infectious waste ➢ Chemical & Pharmaceutical waste ➢ Pathological waste ➢ Other hazardous waste 6. Weight versus Volume 7. Strategy Development – Points to obey 8. Waste stream strategy 9. Overview – Simplified Strategy 10. Decision making
Teaching methods	• Lecture • Group discussions • Demonstration
Assessment	Oral questions and answers
Materials Needed	• Sly Video on Doing the right thing:- Disposing or expired pharmaceuticals in a responsible manner • Simulations • Practical demonstrations/Role play • Focus Group Discussions
Student References	1. Read Blue Book Chapter 5 2. Module 22: Contingency Planning and Emergency Response to Healthcare Waste Spills

Session 22: Financing Healthcare Waste Management in budgeting

Estimated Time	45 Minutes
Session overview	This session discusses allocation of financial resources to ensure proper management of HCW that has an even greater financial cost on the medium-long run in terms of morbidity and mortality and as well as environmental damage that will impact negatively on peoples' health in the end. This is because of the reasons that surrounds invest in HCWM which depends on ethical, legal and financial considerations.
Learning Objectives	At the end of this presentation, participant will be able to: 1. Explain the rational for investing in HCWM program 2. Describe the process involved in costing and financing healthcare waste 3. Use the costing tool to plan a budget for your HCWM program 4. Describe the process involved in the calculation and reporting scheme and the cost per kilo in improving HCWM program
Content	1. Rational for investing in HCWM 2. The costs of healthcare waste 3. Financing the HCW system 4. Calculation and Reporting Scheme 5. 'Cost per kilo'
Teaching methods	• Lecture • Group discussions • Demonstration
Assessment method	• Oral questions and answers
Materials Needed	• Simulations • Practical demonstrations/Role play • Focus Group Discussions
Student References	1. Blue Book Chapter 13 for Training, Chapter 10 for Costing, 2. Module 24: Institutionalization of HCWM Organization, Training, Financing, and Quality Improvement 3. International Centre for Journalism. Medical Waste Recycling: Uncovering a Lucrative Trade (video). 2009 http://www.icfj.org/content/medical-waste-recycling-uncovering-lucrative-trade

8.0 APPENDICES

Appendix 1: Reference Materials

1. Blue Book
2. Environmental Council of Zambia (2007). Technical Guidelines on Sound Management of Health-care Wastes. Lusaka. ECZ Publication.
3. GEF3 Project-Green Hospitals. Mod 9 & 10
4. International Center for Journalism. Medical Waste Recycling: Uncovering a Lucrative Trade (video). 2009 http://www.icfj.org/content/medical-waste-recycling-uncovering-lucrative-trade
5. International Committee of the Red Cross (2011). Medical Waste Management. Geneva. International Committee of the Red Cross
6. Kwakye G, Pronovost PJ, Makary MA. Commentary: *A call to go green in health care by reprocessing medical equipment*. Acad Med. 2010;85(3):398–400
7. Ministry of Health (2015). National Health-Care Waste Management Plan 2015 – 2019. Lusaka. MoH Publication
8. Peal, Andy; Evans, Barbara; Van der Voorden, Calolin (2010): Hygiene and Sanitation Software: An Overview of Approaches. Geneva: Water Supply & Sanitation Collaborative Council
9. Prüss-Üstün, Rapiti & Hutin, 2003. Estimation of the Global Burden of Disease Attributable to Contaminated Sharps Injuries among Health-care Workers. http://www.who.int/quantifying_ehimpacts/global/7sharps.pdf
10. Swedish Red Cross (Ed.) (2008): Slide show of Swedish Red Cross water and sanitation Session 4O ERU deployed in Philippines. Stockholm: Swedish Red Cross. URL: *http://www.ifrc.org/Global/sw-watsan-eru-philippines0808.pdf [Accessed: 20.03.2015]*.
11. The Environmental Management Act No. 12 of 2011. The Environmental Management (Licencing) Regulations, 2013. SI No. 112 of 2013
12. Washington Toxics Coalition: Mercury Thermometers Fact Sheet. May 2002 http://watoxics.org/files/mercury-thermometers
13. WHO (2005). *Mercury in health care*. Policy paper. Geneva, World Health Organization Department of Protection of the Human Environment.
14. WHO (2008). Essential environmental health standards in health care. http://www.who.int/water_sanitation_health/hygiene/settings/ehs_hc/en/
15. WHO (2015). Sanitation safety planning: manual for safe use and disposal of wastewater, greywater and excreta. *http://www.who.int/water_sanitation_health/publications/ssp-manual/en/*
16. Wilburn, S., Eijkemans G. Preventing Needle stick Injuries among Healthcare Workers. Int. J. Occup. Environ. Health, 2004, vol. 10. 451-456 http://www.who.int/occupational_health/activities/5prevent.pdf
17. World Health Organization (2005). Management of Solid Health-Care Waste at Primary Health-Care Centres. Geneva: WHO press.

18. World Health Organization (2014). Safe management of wastes from health-care activities. 2nd edition. Geneva. WHO press.
19. World Health Organization, 2006. Management of Waste from Injection Activities at District Level: Guidelines for District Health Managers. http://www.who.int/water_sanitation_health/medicalwaste/mwinjections.pdf
20. World Health Organization, 2006. Management of Waste from Injection Activities at District Level: Guidelines for District Health Managers. http://www.who.int/water_sanitation_health/medicalwaste/mwinjections.pdf
21. World Health Organization, Salkin, Ira F. Review of Health Impacts from Microbiological Hazards in Healthcare Wastes, 2004. http://www.who.int/water_sanitation_health/medicalwaste/en/microbhazards0306.pdf

Appendix 2: Student Session Evaluation Form

Title of the Session: ……

Name of the Facilitator: ……

Your views are important to us. This therefore calls for your honest evaluation as it will help us in planning future short term course(s) in Healthcare Waste Management. Please take a few minutes to complete this evaluation form.

Using the scale provided, choose the range that best describes your view

Category of evaluation	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
	1	**2**	**3**	**4**	**5**
1. **Presenter/Preceptor**					
a) Knowledgeable about topic	1	2	3	4	5
b) Answered questions completely	1	2	3	4	5
c) Delivered material in a clear and understandable manner	1	2	3	4	5
2. **Presentation material**					
a) Visual aids were clear and easy to understand	1	2	3	4	5
b) Audio-visuals enhanced the presentation	1	2	3	4	5
c) Well-organized	1	2	3	4	5
d) Hand-outs were legible and clear	1	2	3	4	5
3. **Organization/ content**					
a) Presentation was well-organized	1	2	3	4	5
b) Objectives of session were met	1	2	3	4	5
c) Time allocated for presentation was appropriate	1	2	3	4	5
d) Information provided is useful to my subject	1	2	3	4	5
e) I am interested in learning more about this subject	1	2	3	4	5

4. Overall, how would you rate this session:
   a) Excellent
   b) Good
   c) fair
   d) Poor
   e) No opinion
5. What is the most useful part of this session?_____
6. What was the least useful part of this session?_____
7. What information were you hoping would be covered during this session but was not?_____
8. Will you be able to apply the information provided in this session to your public health work?
   - Yes
   - No
   - No opinion
9. Other comments:……...

Appendix 3: Student Course Evaluation Form

Please help us improve the course by responding candidly by circling the most appropriate statements:

Category evaluation	**Strongly disagree** **1**	**Disagree** **2**	**Neutral** **3**	**Agree** **4**	**Strongly agree** **5**
1. Course objectives were well communicated	1	2	3	4	5
2. The training was built to match the way I need to do my job	1	2	3	4	5
3. Adequate time was allocated for explanations/practice	1	2	3	4	5
4. The training materials were well written	1	2	3	4	5
5. Job aids are available to support what I learnt	1	2	3	4	5
6. I know where to get assistance when I return to my job	1	2	3	4	5
7. Overall the class was satisfactory	1	2	3	4	5

8. What did you like most about the course? .....
   ……
9. How can we improve the course? .....
   ……
10. Do you have any additional questions regarding this topic? .....
    ……
11. If you wish us to contact you, please provide the following information: …….
    …….

Appendix 4: Sample Certificate

REPUBLIC OF ZAMBIA

MINISTRY OF HEALTH

Certificate in Health-care Waste Management

This is to certify that

_____

Having successfully completed all training requirements of the Ministry of Health and GEF/UNDP has been duly awarded a Certificate in Health-care Waste Management

on this……..day of……..in the year……

---------- ----------

DIRECTOR, HEALTH PROMOTION, EDUCATION AND SOCIAL DETERMINATES

DIRECTOR GEF/UNDP REPRESENTATIVE

Empowered lives. Resilient nations.

World Health Organization

Health Care Without Harm

gef

No…….

Appendix 5: Terms of Reference for Developing in Healthcare Waste Management Course(s)

1. Training Objectives of the short courses

- To train healthcare providers and handlers on safe and environmentally friendly Healthcare Waste Management (HCWM) practices and systems.
- To ensure consistency with national standards and guidelines on Healthcare waste management.
- To meet training needs in healthcare waste management especially for staff who didn't train in HCWM

2. Course content

The course content shall introduce trainee to:

- General information about healthcare waste management;
- Universal definitions (WHO & ZEMA);
- Classification and generation rates of healthcare waste;
- Aspects of segregation, handling, storage, collection and transportation (internal and external) of waste within the healthcare facilities & beyond
- Management methods for different types of waste;
- Responsibilities for healthcare waste management;
- Treatment options and/or methods for different type of waste e.g. infectious waste; with emphasis on autoclaved waste.
- Water, Sanitation and Hygiene (WASH) and HCWM;
- Occupational safety aspects and first aid measures.
- MEA and Conventions i.e. the Stockholm & Minamata.

3. Category of Staff to be trained

The staffs recommended for the short course training programme are managers in any healthcare facility who oversee health care waste management and these include: Administrators, Environmental Health Officers, Occupational Health and Safety (O.H.S) / Infection Prevention and Control (IPC) officers or Clinical Engineering officers.

4. Teaching Methodology

Participants in these short courses will receive short intensive training (3 -5 days) in content with respect to HCWM, through effective teaching methods and evaluation tools. The course will be a mix of informative theoretical lessons and interactive workshops.

The developed short - term courses should be designed to meet the following lessons:

- Simulations
- Questions and answers
- Exercises
- Practical demonstrations/Role play
- Focus Group Discussions
- A day's field visit/trips

5. Training Expectations

After participating in this course, participants/ candidates should be able to:

- Explain the importance of health care waste management in health care delivery.
- Apply and impact the knowledge gained to improve health care waste management within their facilities.
- Train and support staff training activities in their health facilities.
- Plan & budget for health care waste management activities in their facilities.
- Appreciate the benefits of non-incineration technologies over low temperature incineration.
- Understand the basic operation and maintenance of the treatment technologies.
- Implement health and safety measures to support HCWM.
- Conduct monitoring of healthcare waste management activities at facility level.
- Keep record of healthcare related activities at the facility level.

6. Training Evaluation

At the beginning of each Session, self-evaluation questionnaire (pre-test) will be provided to assess the participant's knowledge in HCWM.

At the end of each Session, self-evaluation questionnaire (post-test) will be provided to assess the participant's learned knowledge, skills and competencies based on the learning objective stated. Participants will be given the opportunity to also evaluate the resource persons and the training programme. Both results will be compared to see how far learning has taken place

7. Duration of course

The refresher short courses should be developed in such a way that they are delivered in three to five (3 – 5) days excluding travel and arrival dates.

Note: The refresher short courses once completed must be administered (to a group of 20 or more participants) and lessons learnt should then be used to complete the curriculum for health sciences institutions to include healthcare waste management.

Appendix 6: Draft timetable for the healthcare waste management course

Session Number	Session Description	Duration in Minutes	Facilitator
	Day One		
	Introductions welcoming of participants	08:30 – 08:45	MoH Representative
	Welcoming remarks	08:45 – 09;00	"
	Objectives of Session and course expectations	09:00 – 09:30	"
1	General Environmental and Waste Information	09:00 – 09:30	Mrs. Florence Kabinga Mwale
2	Basic Microbiology	09:30 – 10:15	Ms. Munyinda Nosiku
	Break	**10:15 – 10:30**	
3	Risks from healthcare activities and wastes	10:30 – 11:45	Ms. Perine Kasonde
4	Environmental Health – Infection control	11:45 – 12:30	Mr. Brian Nkandu
5	Definition and Classification of Healthcare Wastes (WHO & ZEMA)	12:30 – 13:15	Mr. TSibu Bbuku
	Lunch	**13:15 – 14:00**	
6	Definition and classification of waste	14:00 – 14:45	Mrs. Florence Kabinga Mwale
7	Segregation of healthcare wastes	14:45 – 15:30	Ms. Munyinda Nosiku
	Break	15:30 – 16:00	
8	Storage and management at central facilities for different types of waste	16:00 – 17:00	Ms. Perine Kasonde
	Day Two		
	Recap	08:15 – 08:30	
9	Roles and Responsibilities for healthcare waste management	08:30 – 09:00	Mr. Brian Nkandu
10	Alternative Treatment Technologies	09:00 – 09:45	Mr. TSibu Bbuku
	Break	09:45 – 10:00	
11	Sharps: Handling & Mitigation Measures	10:00 – 10:45	Mrs. Florence Kabinga Mwale
12	External transportation of healthcare waste	10:45 – 11: 30	Ms. Munyinda Nosiku
13	Introduction to WASH-FIT Methodology	11:30 – 12:15	Ms. Perine Kasonde
	Lunch	12:15 – 13:00	
14	Mercury Spill management in healthcare facilities	**13:00 – 14:00**	Mr. Brian Nkandu
15	Sanitation	14:00 – 15:00	Mr. TSibu Bbuku
16	Occupational Health and Safety	15:00 – 15:45	Mrs. Florence Kabinga Mwale
	Break	15:45 – 16:00	
17	International Conventions and National HCWM Laws	16:00 – 17:00	Ms. Munyinda Nosiku
	Day Three		

	Recap	08:30 – 08:45	
18	Introduction to Individualized Rapid Assessment Tool (I-RAT)	08:45 – 09:45	Ms. Perine Kasonde
	Break	09:45 – 10:00	
19	Individualized Rapid Assessment Tool (I-RAT) Practical	10:00 – 11:00	Mr. Brian Nkandu
	a) IRAT feedback	12:00 – 13:00	Mr. Sibu Bbuku
	Lunch	13:00 – 14:00	
20	Gender Equality and Human Rights Mainstreaming in Healthcare Waste Management	14:00 – 14:45	Mr Allan Mbewe
21	Healthcare Waste Management Planning	14:45 – 15:30	Mrs. Florence Kabinga Mwale
22	Financing Healthcare Waste Management in budgeting	15:30 – 16:15	Ms. Munyinda Nosiku
	Break	16:15 – 16:30	
	End of the course	16:30 – 17:00	Mrs. Florence Kabinga Mwale
	Total duration	24.75 hr.	