

Module 11. Environmental Management and Energy

Ministry of Health Liberia
Division of Environmental & Occupational Health

WASH & EH Package – Early recovery & Resilience Building from EVD outbreak



Learning objectives

- **To describe elements of a safe Healthcare Facility environment**
- **To identify energy efficiency practices**
- **To emphasize the use of renewable energy at facility level**



Learning Outcomes

At the end of this topic participants will be able to understand:

- **Key components of a safe Healthcare Facility environment**
- **Required interventions towards safer HF environment**
- **Required resources to ensure environmental management**



A safe healthcare facility environment

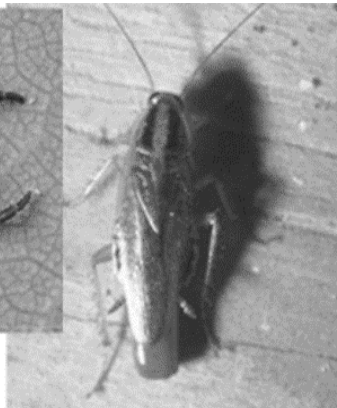
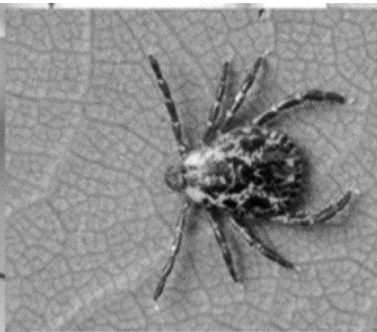
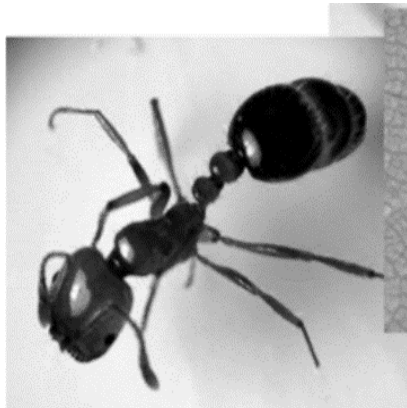
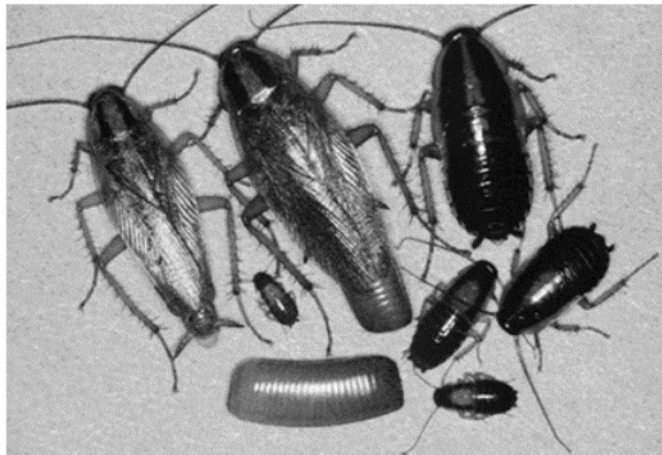
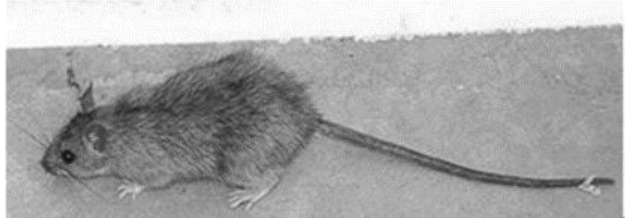
A safe healthcare facility environment is free from:

- Pest organisms or biological entities that compete with humans for food, shelter, water and attention
- Smoke, dust or other types of air pollution
- Inappropriate chemical use and disposal
- Wastewater and storm water
- Accumulated garbage or inappropriate disposed of HCW

A safe healthcare facility SHOULD have sufficient power to ensure adequate lighting and operation of water pumps, refrigeration and sterilization equipment. In addition, there should be enough fuel/energy to support treatment of healthcare waste.



Common pests & animals in HCFs in Liberia



Integrated pest & animal management

A combination of **cultural, mechanical, biological**, and **chemical** technologies designed to control pest and animals. It includes:

- Improving hygiene standards by **eliminating** food, water, garbage and hiding places for pests
- Removing pests **manually** by using hands, setting traps, use of extreme weather to kill them (**get rid of them**)
- Habitat manipulation, cultural control or pest/animal proofing including mosquito nets, solid fence, window screens, etc.
- Using biological control products
- Not attracting pests
- Keep HCF environment clean and free from feces, wastewater and stagnant water



Why integrated pest and animal management?

- **It is environmentally safe and more effective because it is proactive**
- **It is less expensive because it leverages existing operations**
- **It is sustainable because it is based on ecological foundations**
- **It is precautionary regarding risks to environmental health**
- **It is implementable**



Environmental management at facility level

Ensure environmental management by implementing the following:

- **Assign** personnel (EHT) to foresee environmental management
- Conduct **assessment** and implement pollution prevention and control measures
- Ensure environmental **compliance**
- Ensure **training and awareness** among healthcare works
- Incorporate **environmental planning** and HF decision-making into facility plans
- Implement green procurement at HCF level
- Keep records and documentation
- Continuing program evaluation and improvement
- Involvement patients and general community in environmental management



Key environmental management interventions

Implement pollution prevention and control measures. Key interventions are:

- **Ensure proper functioning & maintenance of incinerators to reduce air pollution from black smoke and toxic materials (Dioxins and furans/POPs)**
- **Ensure proper collection, storage and disposal of used oil resulting from generator maintenance to prevent water and soil contamination by hydrocarbons**
- **Ensure proper fueling of various equipment to prevent fuel spills**
- **Prevent soil erosion by planting grass (vegetation cover)**
- **Ensure safe disposal of laboratory reagents and chemical waste**
- **Ensure fencing of healthcare facilities to prevent animals**

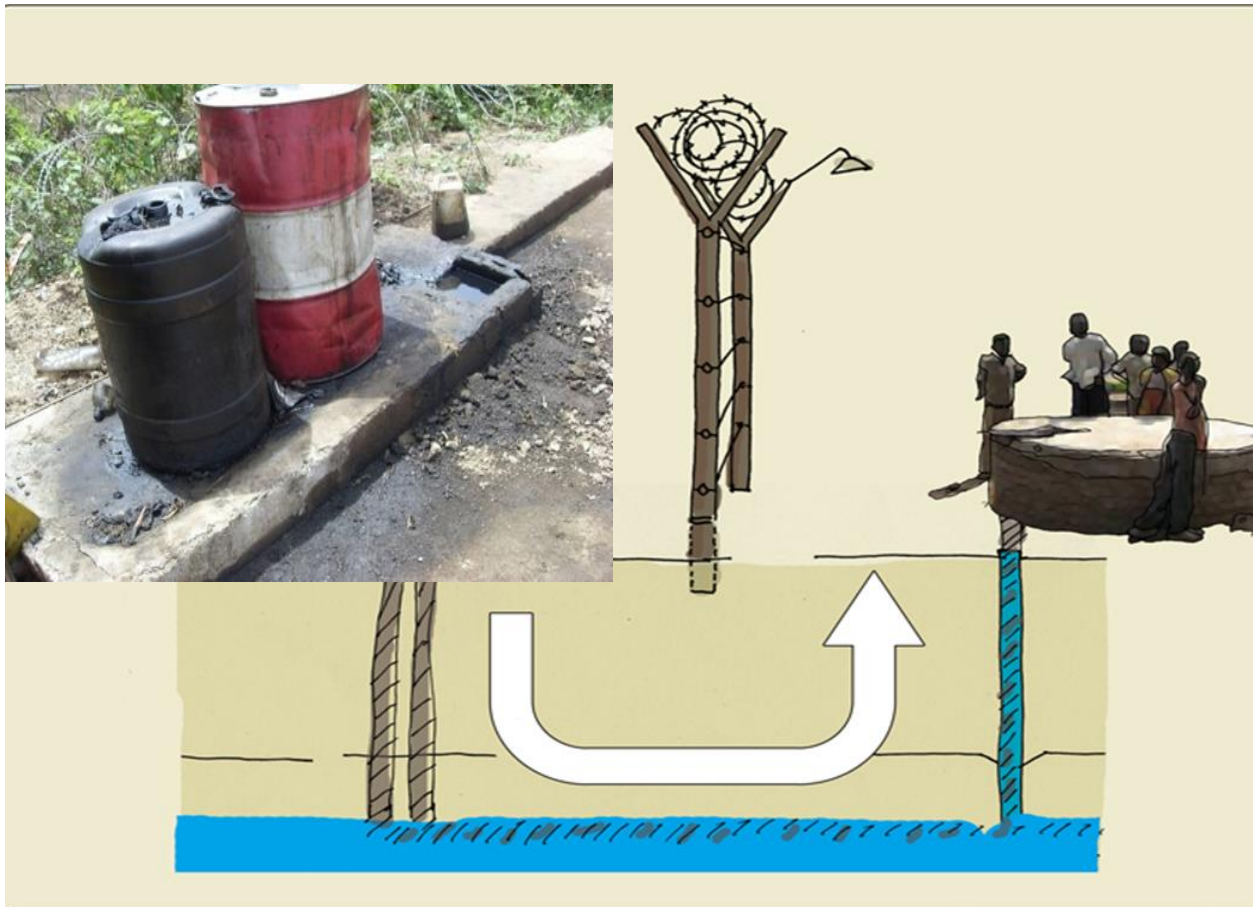


Water leakages and overflows must be immediately reported and repaired



Petroleum, Oil and Lubricants (POL) products

MUST be collected and disposed of in environmental friendly way to avoid ground water contamination. Examples of POL products: Oil, Gasoline, Hydraulic fluids, Kerosene, Diesel, etc.



Effects of POL contamination

- **Pollution of water sources: percolates easily to reach ground water sources**
- **Air pollution**
- **Health effects in human beings**
- **Affects ecosystem**
- **Can be persistent**



Preventing spills and proper storage of fuel and used oil



Management of Spills

- **Take steps to prevent spills from generator location**
- **Have clean-up materials such as rags, saw dust and oil sponge readily available.**
- **Stop the oil from flowing at the source to reduce contamination. If a leak from a container/tank or generator cannot be stopped, recover the oil in another holding container.**
- **Contain spilled oil by isolating the contaminated area, closing the effluent, or spread oil sponge or other clean-up materials over the oil and surrounding area.**
- **Implement bioremediation of POL contaminated sites**



Bioremediation

- **Degradation of organic contaminants such as Oil, Gasoline, Hydraulic fluids, Kerosene, Diesel, organic sludge etc. in the soil or water, by the action of cultured microorganisms selected for their ability to metabolize the specific contaminants.**
- **An example of cultured microorganism is oil sponge**
- **In absence of cultured microorganism, use poultry manure to grow microorganisms for bioremediation**



Oil Sponge

- Bacteria that metabolize hydrocarbons/POL into carbon dioxide and water
- The reaction occurs within seven minutes after adding the bacteria into the media and further decomposition occurs in final disposal site.



Capacity of oil sponge in Bioremediation

- **Oil sponge is capable of metabolizing Oil, Gasoline, Hydraulic fluids, Kerosene, Diesel, organic sludge, etc**
- **1.6 pounds (lbs) of oil sponge degrade 1 gallon of oil/gasoline etc.**
- **30 pounds (lbs) of oil sponge degrade 18 gallons of oil/gasoline etc.**



Why are we concerned about energy?

- Energy is necessary to ensures adequate lighting for safe provision of healthcare including at night
- Energy is key in sterilization of equipment, water pumping, refrigeration, machine-laundry activities, etc.

Proper use of energy in healthcare facilities mitigates climate change effects



Renewable energy

- **Renewable energy is the energy generated from resources which are naturally replenished on a human timescale such as sunlight, wind, rain, tides, waves, and geothermal heat.**



Non-renewable energy

- **Non-renewable energy is the energy generated from original organic material that, with the aid of heat and pressure, becomes a fuel such as oil or gas. They are non-sustainable (they replenish with time). *(Fossil fuels causes green houses gases)***



Energy efficiency practices

- **Turn on air conditioners when required and establish a minimum temperature (24°C=75°F).**
- **Turn off lights, computers and other equipment at the end of the day.**
- **Unplug equipment that uses energy even when they are not in use.**
- **Use solar power for water supply, refrigeration, etc.**
- **Use energy efficient bulbs**



Examples of solar energy use at HFs

Use solar power for water supply, refrigeration, light etc.



INCREASES EFFECTIVENESS OF HEALTH PROGRAMS

1. Use of a solar electric lighting systems by rural health centers increases the quality of health care provided. Solar electric systems improve patient diagnoses through brighter task lighting and use of electrically-lit microscopes.



Examples of solar energy use at HFs

Use solar power for water supply, refrigeration, light etc.



Stecca 160 Liter Vaccine/goods refrigerator freezer



References

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