REPUBLIC OF NAMIBIA

PERFORMANCE AUDIT REPORT OF THE OFFICE OF THE AUDITOR-GENERAL ON THE

MINISTRY OF HEALTH AND SOCIAL SERVICES

MEDICAL WASTE MANAGEMENT

FOR THE FINANCIAL YEARS: 2012/2013, 2013/2014 & 2014/2015

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REPUBLIC OF NAMIBIA

TO THE HONOURABLE SPEAKER OF THE NATIONAL ASSEMBLY

I have the honour to submit herewith my performance audit report on the main study on the Ministry of Health and Social Services - Medical Waste Management, for the financial years 2012/2013, 2013/2014 and 2014/2015 in terms of Article 127(2) of the Namibian Constitution. The report is transmitted to the Honourable Minister of Finance in terms of Section 27(1) of the State Finance Act, 1991, (Act 31 of 1991) to be laid upon the Table of the National Assembly in terms of Section 27(4) of the Act.

WINDHOEK, December 2016

JUNIAS ETUNA KANDJEKE
AUDITOR-GENERAL

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LIST OF ACRONYMS

ABBREVIATION	DEFINITION
APPO	Atmospheric Pollution Prevention Ordinance
HBV	Hepatitis B Virus
HCF	Health Care Facility's
HCRW	Health Care Risk Waste
HCW	Health Care Waste
ICC	Infection Control Committee
ICN	Infection Control Nurse
IHCWMP	Integrated Health Care Waste Management Plan
IPCG	Infectious Prevention and Control Guideline
MOHSS	Ministry of Health and Social Services
MOWT	Ministry of Works and Transport
NGO's	Non-Governmental Organisations
NWMP	National Waste Management Policy
PHC	Primary Health Care
WIS	Waste Information System
IPC	Infectious Prevention and Control

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GLOSSARY OF TERMS

Anatomical waste: refers to body parts, organs, blood and other body fluids (urine, saliva, other secretions), fetuses.

Contamination: presence of infectious agent in blood and other body fluids, on body surface and medical equipment, clothing and supplies.

Disinfection: the inactivation of nonsporing microorganisms using either thermal (heat) or heat and water or chemicals means – to clean something so as to destroy disease- carrying microorganisms and prevent infection and marking it safe to use.

Health Care Risk Waste: refers to all waste that can be considered dangerous or hazardous to either human health or the environment.

Health Care Worker: any person trained to provide patient care (medical, nursing, paramedical, emergency room nurses, community health workers).

Health Facilities: any hospital, health centre or clinic with inpatient facilities. Also, any facility providing emergency or primary health care services.

Incineration: is a complete burning process of organ materials and / or substances destroying microbes and pathogens, using very high temperature (up to 1600℃) to manage waste.

Infection: invasion or multiplication of harmful microorganisms in the body tissue.

Infectious Waste: waste that has the potential of causing infections to human. It includes items contaminated with blood and body fluids from isolation wards, laboratory specimens and stools.

Personal Protective Equipment: Mask, gloves, gowns, eyeglasses, caps, aprons and boots. Provide protection against splashes or spills of infectious material when examining suspected VHF cases or handling infectious waste and laundry.

Sharps: refers to discarded syringes, needles, blades, knives, lancets, scalpels, broken glass, and surgical instruments.

Treatment: to change the biological and chemical character of waste, minimizing its potential to cause harm.

Waste generators: refers to the doctors and nurses that are producing waste during the handling processes.

Waste Handlers: are people who are employed for collection, treatment and disposal of waste.

EXECUTIVE SUMMARY

The Auditor-General is authorized to carry out performance audits in terms of Section 26(1)(b)(iv) of the State Finance Act, 1991 (Act 31 of 1991) which reads as follows: (The Auditor-General), *"may investigate whether any moneys in question have been expended in an efficient, effective and economic manner."*

Furthermore, Section 26 (3) of the State Finance Act authorised the Auditor-General to carry out special audits of which environmental audit is one.

The purpose of the audit report is to assess whether the Ministry of Health and Social Services is effective in the management of Health Care Risk Waste and the impact on the environment and human health.

The main findings of the audit are as follows:

- The MOHSS has developed the National Waste Management Policy (NWMP) of 2011, Infection Prevention and Control Guideline (IPCG) of 2010 and the Integrated Health Care Waste Management Plan (IHCWMP) of 2012 to manage Heath Care Risk Waste (HCRW). However, these guidelines are not complied with because there is no uniformity in the management of Heath Care Risk Waste (HCRW) at all the State health facilities visited. As a result, there is improper management of HCRW at the State health facilities. These are discussed as follows:

    - The HCRW was not properly segregated at the point of generation (ward and clinic levels) due to ignorance since health care workers are receiving pre- and in-service trainings. As a result, this poses health risk to all those who come in contact with the waste when disposed-off;

    - The HCRW bags are collected twice internally from the hospital wards and screening rooms to the designated storage areas. However, collection from external health facilities' storage area (those without incinerators or if non-functional) is done weekly instead of within two days due to a lack of exclusively designated vehicles for HCRW. As a result, bacteria growth and odours are not minimized;

    - There were no separate trolleys for the removal of HCRW bags and were transported with inappropriate trolleys or by hand. As a result, this poses health

risk to waste handlers during transportation since there is contact by hand and body;

- The designated storage areas at all the State health facilities visited are not well-managed and did not conform to the storage requirements as stipulated in the IHCWMP. As a result, it poses a health risk to waste handlers and lead to cross-contamination.

- There are no designated vehicles exclusively for the transportation of HCRW at visited health facilities. As a result, this poses health risk to health workers and patients as vehicles are used for multiple functions;

- The routine maintenance and repair on the incinerators by the maintenance division under the Ministry of Works and Transport were not conducted as required, because the artisans do not have the skills and knowledge to maintain and repair the incinerators. As a result, the MOHSS relies on a private contractor, Central Technical Supplies (CTS) which is the only service provider that maintain and repair incinerators in the country which can be costly as they monopolies the industry;

- Incineration was the standard method of treating HCRW for all State health facilities visited. However, the Incinerator operators at Oshakati Intermediate and Opuwo District Hospital were burning HCRW at the Municipal dump site and on-site burial pit which causes air pollution and poses a health risk to humans and the environment.

- The residues from the incinerators were disposed on surface ground and shallow pits at the municipal dump site and hospital premises although sharps and vials were not completely destroyed. As a result, uncovered residue poses health risk to scavengers and children who might be injured by sharps as some houses are closely located to the municipal dumping sites i.e. Oshakati;

- All the State health facilities visited did not implement the Waste Information System (WIS) as stipulated in the National Waste Management Policy and there is no database on waste generated. As a result, it could lead to poor planning of the HCRW management system.

- The incinerators at all State health facilities visited were designed with a specific load capacity as required. However, the incinerator operators are not adhering to

the prescribed loading guidelines. The operators indicated that adherence to the prescribed loading guidelines is time consuming which results in overloading of the machine. As a result, toxic dark smoke is emitted into the environment which poses a health hazards to those living in the vicinity of the incinerator;

- The Viral Hepatitis B vaccine were available at all State health facilities visited for the immunization of all health care workers and waste handlers exposed to Hepatitis B virus (HBV). However, not all health care workers and waste handlers exposed to Hepatitis B virus (HBV) had completed the three doses and no proper records were kept. As a result, health care workers and waste handlers are exposed to Hepatitis B virus infections;

- Waste handlers and Incinerator operators were not provided with the minimum standard of protective clothing as required. As a result, this poses a health risk to the waste handlers during handling because body contact is not limited; and

Not all State hospitals visited had the Infection Control Committees established and active to ensure proper management of HCRW at State health facilities. Furthermore, the Infection Control Nurses are responsible to educate and train health care workers and waste handlers on HCRW management practices at State health facilities. However, the staff establishments did not make provision for all State hospitals to have Infection Control Nurses posts. Therefore, there is inadequate training and awareness amongst staff members regarding the HCRW management practices. As a result, there is improper management of HCRW at the State health facilities.

CONCLUSION

The IHCWMP and the Public and Environment Act are in contradiction with regard to the burning of HCRW waste.

The Atmospheric Pollution Prevention Ordinance 11 of 1976 dealing with the aspects of hazardous waste management is outdated.

The State health facilities are not conforming to the National Waste Management Policy (NWMP) of 2011, Infection Prevention and Control Guideline (IPCG) of 2010 and the Integrated Health Care Waste Management Plan (IHCWMP) of 2012 with regard to the management of Heath Care Risk Waste (HCRW) practices.

RECOMMENDATIONS

The MOHSS should ensure that the IHCWMP and the Environmental Act are harmonized.

The MOHSS should follow-up on the Pollution Control and Waste Management Bill of 2003 with the Ministry of Environment and Tourism in order to repeal the Atmospheric Pollution Prevention Ordinance 11 of 1976.

The Ministry of Health and Social Services (MOHSS) should put measures in place to ensure that all State health facilities are conforming to the policy and guidelines with regard to the management of Heath Care Risk Waste practices.

Comments received from the Ministry of Health and Social Services

"We would like to inform you that the Public Environmental Act 1 of 2015 is not in force yet. The regulations are still under drafting and they will make provision for requirements relating to waste management practices.

Matters addressed in the findings, Chapter 4 of the report will be addressed through oversight supervision to ensure the guides, policies and relevant documents are implemented and enforced."

The Ministry of Environment and Tourism did not comment on the relevant findings in the report despite several reminders and telephonic conversations.

CHAPTER 1

1. INTRODUCTION

1.1 Background of the Audit

Health Care Risk Waste (HCRW) also known as infectious waste or hazardous waste is defined as waste generated within the Health-care Sector as a result of diagnosis, testing, treatment, research or production of biological products and immunization of humans or animals. As such, improper management of HCRW can have direct or indirect negative impacts on patients, health workers, local communities and on the environment. This waste poses biological, physical, chemical and radiological hazards to those involved in their handling, treatment and disposal.

It is a public health risk when people come in contact with untreated HCRW. Improper treatment methods can result in public health problems and pollute the environment. Therefore, it is the responsibility of Government to effectively manage HCRW.

1.2 Audit Motivation

The audit was motivated by problems that were identified after conducting a preliminary audit. These are identified as follows:

- Improper segregation, collection and storage of HCRW;
- Inappropriate disposal of HCRW at disposal sites;
- Failure to properly treat HCRW at disposal sites;
- Non-adherence to the Waste Management Policy and the Integrated Health Care Waste Management Plan of 2012 (IHCRWMP); and
- Lack of uniformity among State health facilities and failure to effectively implement the IHCWMP.

In the view of the above stated problems, the Office of the Auditor-General decided to conduct a main study with an environmental focus on the management of Health Care Risk Waste.

1.4 The Mandate, Vision and Mission statement

Mandate

"The mandate of the Ministry of Health and Social Services (MOHSS) is derived from the Namibian Constitution, Article 95 where the State is required to maintain the welfare of the people by putting in place legislation that seeks to provide health care of the people and also to ensure social welfare for the people including the weak and vulnerable members of the society."

"The Ministry shall have an overall function to develop essential health care programmes based on Primary Health Care (PHC) approach which is scientifically sound and socially acceptable based on standards and latest technology, universally accessible to individuals and families in the communities with their full participation and at a cost that the country can afford to maintain at every stage of the development in the spirit of self-reliance and self-determination. To provide information, advice and training communities to understand PHC approaches and its contribution to the health promotion and prevention of diseases and rehabilitation of those who are in need."

Vision

"The Ministry of Health and Social Services, the leading provider of quality health care and social services."

Mission Statement

"To provide integrated affordable, accessible quality health care and social services responsive to the needs of the population."

1.5 Organisation Structure

1.5.1 The Ministry of Health and Social Services

The Ministry is headed by the Minister. The Permanent Secretary reports to the Minister and there are ten Directorates headed by Directors who reports to the Deputy Permanent Secretary whom then reports to the Permanent Secretary.
The ten Directorates are as follows: Primary Health Care; Developmental Social Welfare Services; Regional Health and Social Welfare Services; Special Disease Programmes; Tertiary Health Care Services; Policy, Planning and Human Resources Development; Human Resources Management and General Services; Referral Hospital Services; Finance and Logistics; and Automatic Energy and National Radiation Protection Regulator. The audit focused on the Directorate of Primary Health Care. The main responsibilities of the directorate are as follow:

1.5.1.1 Primary Health Care

- Policy design, standard setting and quality assurance;
- Operational research for various programmes;
- Provision of technical support to regional and district levels;
- Resources and information management;
- Networking and linkages with other sectors; and
- Monitoring and periodic evaluation of programme implementation.

1.6 Finance

The budgeted and actual expenditure relating to HCRW management could not be specifically identified on the budgets of the Auditee. This is due to waste management budget that is integrated in the regional budget. Thus, making it difficult to include expenditure figures that are specifically attributed towards HCRW management.

1.7 Staffing

Staffing for the Primary Health Care Directorate could not be specifically identified as only the staff establishment which was approved in 2003 could be provided.

CHAPTER 2

2. AUDIT DESIGN

2.1 Audit Scope

The audit focused on assessing whether the management of Health Care Risk Waste at the State health care facilities is in compliance with the laws, guidelines and regulations, and what the impact is on the environment. The State health facilities visited during the audit included a national referral hospital, two intermediate hospitals, three district hospitals, five health centres and six clinics.

Three financial years were covered which are 2012/13-2014/15 in order to establish a trend for the periods under review and for comparison purposes.

2.2 Areas of Coverage

2.2.1 Audit Objective

To determine whether medical waste management practices at the State health facilities are in compliance with the laws, guidelines and regulations as well as the impact on the evironment.

2.2.2 Geographical Coverage

The audit covered all the 14 regions of which four regions were visited namely Khomas, Oshana, //Kharas and Kunene. The selection was based on the regions visited during the Pre-study, namely the Khomas and //Kharas regions.

Additionally, the Oshana and Kunene regions were visited. The Oshana region, which has an intermediate referral hospital was selected because it provides incineration services to all private and State health facilities within the region. This include neighboring regions such as Omusati, Ohangwena, Kunene and Oshikoto if the incinerators were not functional. The Oshakati intermediate hospital can be compared with the Katutura Intermediate referral hospital in the Khomas region. Kunene region was added for comparison purposes with the //Kharas region in particular with the Luderitz District Hospital.

2.3 Audit methodology, Assessment Criteria and Methods of Data Collection

Audit questions	Assessment criteria	Sources of data collection	Objectives
1. To what extent is the management of HCRW in compliance with the laws, guidelines and regulations of the Ministry? 2. What are the causes of inappropriate management of HCRW at the State health facilities?	The criteria used were derived from the following sources: • Public and Environmental Health Act No. 1 of 2015; • National Health Act No. 2 of 2015; • National Waste Management Policy of 2011; • Stockholm Convention of 2001; • Basel Convention of 1989; • Integrated Health Care Waste Management Plan of 2012; and • Infection Prevention and Control Guideline of 2010.	**Documentary reviews** Ministry's Integrated Health Care Waste Management Plan (2012 and the Infection Prevention and Control Guideline (2010). **Interviews** Management and staff involved in the medical waste management from the MOHSS. **Physical Observation** A walk-through test was done.	To determine whether medical waste is segregated correctly according to categories

CHAPTER 3

3.1 SYSTEM DESCRIPTION

The mandate of the MOHSS is derived from the following acts, policy, conventions and guidelines:

3.1.1 National Health Act 2015, No. 2 of 2015

The Ministry of Health and Social Services (MOHSS) is mandated by the National Health Act 2015, (No. 2 of 2015) "…. to provide a framework for a structured uniform health system within Namibia; to consolidate the laws relating to State hospitals and State health services, and to regulate the conduct of state hospitals and State health services; to provide for financial assistance for special medical treatment of State patients; and to provide for incidental matters."

3.1.2 Public and Environmental Health Act, 2015 (No. 1 of 2015)

The Public and Environmental Health Act, 2015 (No. 1 of 2015) states that the MOHSS should: "provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.

Section 52, Subsection 3 of the Public and Environmental Health Act, 2015 (No. 1 of 2015) states that, "… a person or local authority engaged in activities contemplated in subsection (1) or (2) must ensure that the waste generated on the premises concerned is kept and stored –

(a) under conditions that cause no harm to human health or damage to the environment; and
(b) in accordance with applicable laws."

Section 53, Subsection 4 of the Public and Environmental Health Act, 2015 (No. 1 of 2015) states that "… a person may not burn waste either in a public or private or at a waste disposal site."

3.1.3. Stockholm Convention of 2001

According to the Stockholm Convention on Persistent Organic Pollution, article 6(1)(d)(i) states that, "… take appropriate measures so that such wastes, including products and articles upon becoming wastes, are handled, collected, transported and stored in an environmentally sound manner."

3.1.4 The National Waste Management Policy of 2011

According to the National Waste Management Policy (NWMP) of 2011, the MOHSS "… shall develop and review legislation, standards and guidelines on waste management." The MOHSS is responsible:

- "To design appropriate means of safe and sustainable waste management;
- To develop capacity and training on waste management for sustainable and sound waste management;
- To create community awareness on safe waste management and minimize unsafe waste practices that could lead to diseases;

- To promote inter-sectorial collaboration in waste management;
- To promote research in waste management; and
- To provide a legal framework for development of waste management legislation."

3.1.5 Integrated Health Care Waste Management Plan

According to the Namibian Integrated Health Care Waste Management Plan (IHCWMP) of 2012, "each institution, small or larger, generating HCRW should have a HCRW Management Plan and establishes an appropriate infrastructure and mechanisms to manage HCRW. This should include establishing waste management committees for larger facilities and/ or Infection Control Committees."

3.2 Role and Responsibilities of key players

3.2.1 Hospital Infection Control Committees

According to Infection Prevention and Control Guideline (IPCG) of 2010 for MOHSS, the functions of the hospital Infection Control Committee (ICC) are to:

- "Identify the needs of the facility in relation to infection control (e.g. waste management, food safety, sterilization etc.)
- Prioritize needs and develop a strategic plan (3-5 years) and make recommendation for adequate funding to present to management;
- Analyse infection control risks and make recommendations to acquire new equipment, pharmaceuticals, and products for effective infection control practices;
- Develop an annual infection control programme budget in relation to agree upon priorities, resources needs and scheduled activities;
- Develop monitoring and evaluation tools and product regular monitoring and evaluation visits to review the infection control programme implementation;
- Participate in regular review of infection control guidelines and practices;
- Ensure regular review and adaptation of policies and guidelines to local priorities;
- Ensure regular training, surveillance and auditing for effective infection control practices;
- Ensure regular cleanliness surveys are conducted and regular hand washing campaigns;
- Ensure the identification of structural needs for infection control as part of facility repair and maintenance;
- Ensure the development of a hospital outbreak response protocol;
- Conduct regular management meetings to review programme implementation; and
- Scrutinize and approve infection control reports for submission to Regional and National level."

3.2.2 Infection Control Nurse

According to the Infection Prevention and Control Guideline (IPCG) of 2010 for MOHSS, "A nurse formally trained in Infection Control is able to provide specialist and appropriate guidance to health care workers in the hospital and district on infection control practices. Detailed responsibilities include:

- Training in infection control practices (formal and informal), at induction and on a continuous basis;
- Continuous education on infection control for implementers with assistance of link nurses;

- Auditing the environment for compliance to standard practices, using monitoring and evaluation tools (hand washing, safe waste disposal);
- Respond on issues of concern on daily and ad hoc basis;
- Routine screening of patients (surveillance) in high-risks areas;
- Risk management to prevent infection, protect staff and patients and detect outbreaks;
- Monitoring infectious disease management in isolation and surveillance laboratory testing;
- Collect process and analyse data to review and manage the programme;
- Report to the Infection Control Committee on monthly basis;
- Conduct regular meetings with the link nurse to identify issues of concern and support nurses in addressing such issues effectively;
- Maintain infection control equipment inventory;
- Ensure compliance with local and national guidelines; and
- Liaise with relevant district health structures and others where appropriate.

3.2.3 Control Environmental Health Practitioners

According to the duty sheet, the Environmental Health Practitioners are responsible for the:

- "Planning and budgeting for environmental health services in the region;
- Supervision and management of environmental health services in the region;
- Monitor and evaluate environmental health projects in the region;
- Statutory control of public places;
- Facilitating in the implementation of public and environmental health policies, guidelines and legal tools;
- Liaise with other line Ministries, Non-Governmental Organisations (NGO's) and other relevant stakeholders to improve environmental health services;
- Inspections and registration of business places;
- Management of environmental health services at point of entry in the region;
- Ensure timely response to emergencies and management of epidemics;
- Food safety assurance;
- Hygiene and sanitation promotion;
- Ensure safety at work places; and
- Review environmental health impacts assessment reports and action plans."

3.2.4 Waste Handlers (Cleaners)

According to the Infection Prevention and Control Guideline (IPCG) of 2010 for MOHSS waste handlers are responsible to:

- "Implement regular and routine cleaning of all surfaces and maintain a high level of hygiene in the facility;
- Ensure that cleaning areas are classified according to their varying need for cleaning and implement the policy accordingly;
- Determine appropriate work systems to ensure cleaning, laundry and waste disposal are efficiently executed on a daily basis;
- Regularly inform maintenance on building problems, repairs, cracks, and defects;
- Prevent and monitor for the presence of pests and report to the local Health Inspector;
- Provide training to new staff and regular updates on new techniques and procedures; and
- Develop and execute extensive training on an annual basis to address the pertinent aspects of: - hand washing, cleaning methods, correct use of diluting agents and equipment, waste disposal."

3.2.5 Ministry of Works and Transport

According to the National Waste Management Policy (NWMP) of 2010, "... MOWT is responsible for a routine maintenance and contingency plan for Health Care Risk Waste as well as maintenance and repair of buildings and equipment (incinerator)."

3.2.6 Central Technical Suppliers (CTS)

According to the CTS guideline, CTS assist with incineration needs, providing incinerators that can destroy hazardous, medical, domestic and animal waste. The incinerators range from a small load capacity to over 200kg/hour, and are either gas or diesel fired. Not only can CTS provide the incinerator, but also installation virtually at any site within Namibia as well as routine servicing.

3.3 Process Description

3.3.1 Health Care Risk Waste Management

According to the Namibia Integrated Health Care Waste Management Plan of 2012, "... health care waste risk management is a process to ensure proper health facility hygiene and safety. It also minimizes the risks associated with the waste outside of the facility".

3.3.2 Health Care Waste Stream

The following are the key steps under the Health Waste stream: generation, collection and on-site transport, on-site storage, off-site treatment and disposal methods inside and outside the facility.

3.3.2.1 Generation of Waste

Generation of waste refers to any waste which is created during diagnosis, treatment or immunization of human beings in a hospital, health centre and clinic.

3.3.2.1.1 Segregation

According to the Integrated Health Care Waste Management Plan of 2012, "... Segregation is the process of separating different types of waste and keeping them isolated from each other. This process should be done correctly at the point of generation. Segregation of waste relies on designated staff to correctly identify waste according to its category. Correct segregation ensures that the correct treatment and disposal of waste occurs".

Segregation of waste

Waste should be identified according to waste categories and placed in appropriate containers as discussed below:

3.3.2.1.1.1 General Health Care Waste

According to Integrated Health Care Waste Management Plan of 2012, "... this waste should join the domestic refuse stream for disposal. Color-coded containers should be used i.e. black containers for non-infectious dry waste (e.g. bottles, cans, paper and cartons) while yellow plastic bags should be used for non-infectious wet waste (e.g. kitchen waste). It is important that the types of containers used at the point of generation are bags. Aerosol containers may be collected with general HCW once they are completely empty. Aerosol containers should not be burnt or incinerated".

3.3.2.1.1.2 Infectious Waste

According to Integrated Health Care Waste Management Plan of 2012, "... Place the waste in a RED, leak-proof and strong plastic bag container and mark "INFECTIOUS".

- Small amounts of chemical or pharmaceutical waste may be collected together with infectious waste;
- Highly infectious waste, whatever possible, must be sterilized immediately by autoclaving;
- Never re-sort waste. If general waste and infectious waste are mixed by accident in one bag, it should be treated as infectious waste;
- Place red bag in a container such as a pedal bin or wheelie bin in a location not easily accessible to passers-by or to children;
- Seal red bag with a tape or plastic tie when 3/4 full to reduce the risk of spilling or breaking;
- If the red bags are not available, use any of the available color bag and mark with the Biohazard Stickers – Universal biohazard waste symbols;
- If the biohazard sticker is not available, prepare a label with the following information: type of waste, origin or where produced in the hospital, date collected, for incineration".

3.3.2.1.2 Body Parts/Human Tissues

According to the Integrated Health Care Waste Management Plan of 2012, "... handling practices for body parts and human tissue are as follows:

- Wrap body parts/tissue in an intact plastic bag;
- Re-wrap in the red plastics bag;
- Place in a prescribed biohazard box, or any strong box;
- Seal the box with the biohazard stickers; and
- Write the following information on the box: date collected, origin and destination of the waste."

3.3.2.1.3 Cytotoxic waste

According to the Integrated Health Care Waste Management Plan of 2012, "... most of which is produced in major hospitals or research facilities, should be collected in strong, leak-proof containers clearly labeled "Cytotoxic wastes." Precautions must be taken during the handling of cytotoxic pharmaceuticals. The release of these products can have adverse environmental impacts. The management of these wastes, in covered and impermeable containers, must therefore be strictly controlled. Solid containers must be used for collection".

3.3.2.1.4 Sharps

According to the Integrated Health Care Waste Management Plan of 2012,

- "Place sharps waste in a YELLOW or other relevant sharps box. When such containers are not available, use plastic containers or other rigid and mark with the words "SHARPS" and indicate with biohazard Symbol;
- Sharps should all be collected together, regardless of whether or not they are contaminated;
- Containers should be puncture-proof [usually made of cardboard (per UNICEF/WHO recommendations) or metal or high-density plastic] and fitted with covers;
- Sharps require that the measures taken to prevent injury and infection during their handling within and outside of the HCFs;
- Containers should be 3/4 full;
- Containers should be tied or placed in a trolley and not the floor;
- Use the appropriate shape and size containers for the sharps to be discarded;
- Do not press sharps to make room for more; and
- When 3/4 full, seal the sharps container and place in a red bag for incineration".

3.3.2.1.5 Hazardous chemicals/ Pharmaceuticals

According to Integrated Health Care Waste Management Plan of 2012,

- "Large quantities of chemicals should be parked in chemicals resistant containers and sent to a designated facility. The identity of the chemical should be clearly marked on the containers. Hazardous chemical waste of different types should never be mixed;
- Large quantities of obsolete or expired pharmaceuticals stored in hospital wards or departments should be returned to the pharmacy for disposal. Other pharmaceuticals waste generated at this level, such as expired medicines or packaging containing drug residues should not be returned because of the risks of contaminating the pharmacy. It should be deposited in a specific container at the point of generation; and

- Waste with high content of heavy metals (e.g. cadmium or mercury) should be collected separately. This waste should be sent to designated facility".

3.3.2.1.6 Radioactive Waste

According to Integrated Health Care Waste Management Plan of 2012,

- "Place waste in a lead box and label with the radioactive symbol; and
- Radioactive waste should be segregated according to its physical form; solid and liquid and according to its half-life or potency; and short-live in specifically marked containers".

3.3.3 Collection and On-site transport within the health facilities

3.3.3.1 On-site and off-site Collection

According to the Integrated Health Care Waste Management Plan of the year 2012, "the proper collection and transportation is important in health care waste management. Its implementation requires the direct involvement of the HCF maintenance services, housekeeping services, fleet services and cooperation of all health personnel".

The following are recommendations that should be followed by health care personnel directly:

- Staff members should ensure that waste bags are tightly closed or sealed when they about three- quarters full.
    - ❖ Light gauge bags can be closed but tying the neck, but heavier gauge bags will most likely require plastic sealed tag of self-locking type; and
    - ❖ Bags should not be closed by stapling;

- Hazardous/ infectious waste should be collected on separate trolleys.
    - ❖ The trolleys should be marked with the corresponding color black/yellow and washed regularly.
- No bags should be removed unless they are labeled with their point of production (hospital ward or department) and contents.

Requirements for Packaging for Off-site Collection:

- The HCW generator is responsible for the safe packaging and adequate labeling of waste to be transported off-site and for authorization of its destination;
- Waste should be placed first in containers (e.g. cardboard boxes or wheeled, rigid, lidded plastic or galvanized bins) before it is loaded on to a designated vehicle;
- The bags/containers should be sealed to prevent any spillage during transportation and should be robust to withstand vibration or changes in temperature, or atmospheric pressure;
- Infectious and pathological waste should be bagged in appropriate color-coded bags or other special containers when transported; and

- All waste bags or containers should be labeled with basic information on their content and on the waste generator. This information may be written directly on the bag or container or on pre-printed labels, securely attached. Basic information should include but not limited to the following:

    - Types of HCW;
    - Form of waste and waste category; and
    - Date of collection".

3.3.3.2. On-site Transportation

According to the Integrated Health Care Waste Management Plan of 2012, "HCRW should be transported within the hospital or other facility by means of wheeled trolleys".

3.3.4 On-site storage

According to the Integrated Health Care Waste Management Plan of 2012, "... after wastes are placed in appropriate containers and segregated, the next step is to store the waste. The waste should be collected from the units/location where it was generated and stored in a designated waste storage area until transported to the treatment location. This area should be marked with a warning sign. Designated areas are usually a separate location, yet not too far, from the main building of the HCF. All hospitals, health centers and large clinics should have cold storage units. In facilities where there is a lack of such spaces, daily collection and disposal should be enforced".

"The following guidelines should be followed for temporary storage waste before treatment/ disposal:

- The waste must be kept in tight receptacles and under stable temperature (5-8°C) conditions when stored temporary for prolonged period of time;
- Biodegradable general and hazardous waste should not be kept longer than 2 days to minimize microbial growth, putrefaction and odors;
- If the waste must be stored longer than 2 days, application of treatment like chemical disinfections or refrigeration at 2°C or lower is recommended;
- Maximum storage time should not exceed 48 hours during summer and 72 hours during winter;
- Non-risk HCW should always be stored in a separate location from the infectious / hazardous HCW in order to avoid cross-contamination;
- Cytotoxic waste should be stored in lead containers that prevent dispersion; and
- The facility should be limited to unauthorized personnel".

Requirements for on-site and off-site storage facilities includes:

- "The storage areas should have an impermeable, hard-standing floor with rounded floor of concave edges and good drainage, it should be easy to clean and disinfect;
- There should be water supply for cleaning purposes;
- Easy access to storage areas for staff in charge of handling the waste;
- It should be possible to lock the storage areas to prevent access by unauthorized persons;
- Easy access for waste collection vehicles and not located near kitchen areas;

- Protection from the sun, rain, strong winds, floor, etc.; and
- Good lighting and adequate ventilation."

3.3.5 Off-site transportation

According to Integrated Health Care Waste Management Plan of 2012, "... this step in the chain of health care waste management involves transportation of waste to treatment or disposal facilities and certain rules need to be followed:

The requirement for off-site Collection Vehicles are:

- "The vehicles that transports special HCRW should be used exclusively for this purpose;
- Collection vehicles used for the transport of HCRW should not be used for the transport of any other materials that could be seriously affected by contamination such as food, livestock, people or retail goods;
- The HCRW should be transported only by an accredited transporter or carrier. The transporting organisation should be registered as per Registration and Licensing Strategy;
- The vehicle should have an enclosed leak proof body and capable of being locked to secure the waste;
- The vehicle must have a suitable body with a height of 2.2 meters;
- The vehicle must have a system to secure the load;
- The vehicle must have a separate compartment for emergency equipment;
- Must have an interior that will allow steam cleaning;
- Internal finishing of the vehicle should allow it to be steam-cleaned, and the internal angles should be rounded;
- The vehicle should be cleaned at the end of each day and in the event of any spillage;
- The vehicle should be marked with the name and address of the waste;
- The international hazard sign and emergency telephone number should be displayed on the vehicle or container;
- Empty plastic bags, suitable protective clothing, cleaning equipment, tools and disinfectant, together with special kits for dealing with liquids spills should be carried always and in a separate compartment; and
- The waste must always be properly documented and all vehicles should carry a consignment note from the point of collection to the treatment facility. The information to be indicated on the note must include date and place of production, waste quantity, category and destination.

According to article 4 section 2(d) of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal states that, "... each party shall take appropriate measures to: ensure that the transboundary movement of hazardous wastes and other wastes is reduced to the minimum consistent with the environmentally sound and efficient management of such wastes, and is conducted in a manner which will protect human health and the environment against the adverse effects which may result from such movement".

Furthermore, section 7(c) states that, "... each party shall require that hazardous wastes and other wastes be accompanied by a movement document from the point at which a transboundary movement commences to the point of disposal".

3.3.6 Off-site Treatment and Disposal of HCRW

3.3.6.1 Type of wastes that can be incinerated

According to Infection Prevention Control Guidelines (IPCGs) of 2010, incineration is recommended for the following wastes:

- "Needles and syringes;
- Used treatment materials and dressings;
- Non-reusable personal protective equipment; and
- Laboratory supplies."

3.3.6.2 Type of wastes that should not be incinerated

According to the Integrated Health Care Waste Management Plan of 2012, the following items should never be incinerated or send for incineration:

- "pressurized gas containers;
- Polyvinyl Chloride (PVC) plastics;
- Glass vials;
- X-ray / photographic materials; and
- Batteries".

Waste with heavy metals, particular mercury or cadmium should never be incinerated".

According to the Integrated Health Care Waste Management Plan of the year 2012, "... Incineration was the standard and most common technology to treat infectious waste for many decades. Incineration is the current practice used in Namibia for medical/clinical waste disposal. If not managed properly it can cause harmful substances; such as air pollution and other risks to human and the environment".

"Burning is not an advisable method of waste treatment but if practiced should be under strict supervision; incinerator ash remaining at the bottom of an incinerator after a burn down contains heavy metals that may leach out, as well as dioxins and furans and for this reasons, it should be handled as hazardous waste."

Treatment facilities, "once installed, on identification board would be displayed at the entrance of the facility. The name of the facility, the address and the telephone number of the operator and, the hours of operation and the telephone numbers of personnel to be contacted will be displayed on the signage".

Management of HCRW at the incinerators

According to Integrated Health Care Waste Management Plan of 2012, "... a number of rules should be applied when managing HCRW at the treatment facility:

- When HCRW is delivered to the incinerator plant, the packaging will be checked to ensure that it is undamaged;

- Facilities would be available at the incineration site for the cleaning and disinfections of transportation equipment, including vehicles;
- Automatic loading device for bags and containers rather than manual will be used to ensure protection of the safety of workers;
- HCRW will not be stored for more than 24 hours at the incineration plant;
- If HCRW is stored for more than 24 hours, a cooling facility will need to be established;
- The incinerator operator is required to wear protective clothing and wash hands regularly;
- The operator shall be vaccinated against Hepatitis B virus (HBV) and tetanus, and will have regular medical checkups (every six months);
- Adhere to the instructions in the manual to destroy medical waste deposited;
- The operator shall receive the consignment note / manifest document and verify the information and ensure that the form is signed appropriately;
- Complete the Waste Deposited form upon disposal of ash or treated waste;
- A single chamber, drum and brick incinerators will not be accepted;
- The incinerator chambers should not operate at a temperature below 850°C and there should be no cold regions; and
- Ampoules should not be burnt or incinerated as they will explode, possibly causing injury to operators and damage to the furnace or incinerator".

Furthermore, the repair and maintenance of the incinerators, according to the National Waste Management Policy of 2010 "... the MOWT is responsible for a routine maintenance and contingency plans for HCRW as well as maintenance and repair of buildings, and equipment (incinerators)".

3.3.6.3. Waste Information System

According to the National Waste Management Policy of 2010, "... waste information System shall be established under the Directorate of Primary Health Care to collect data, analyse and distribute it for use. Information resource shall be made available to the district, regions and the public at large. Research and survey results shall be accessible to all those who need it either for planning or proposal and project design".

3.3.6.4 Loading Capacity

According to the Integrated Health Care Waste Management Plan of 2012, "... each incinerator is designed with a specific load capacity".

Furthermore,

- "The operator shall verify that any waste received is appropriately packaged;
- The operator should weigh the waste and record it in the log book provided;
- If the waste is not packaged correctly, this will be reported to the supervisor;
- The operator shall weigh the waste to be incinerated and record the quantities on the Manifest Document;
- The operator shall incinerate the HCRW in accordance with "best practices";
- The operator shall submit all records regarding waste management to the supervisor on a monthly basis; and
- Keep a carbon copy of all records at the facility. These records must always be available for inspection at the site".

The prescribed Operational Guideline for incinerators states that, "… the operator must learn the best loading pattern by trial and error:

- He must not overload;
- He must not turn the fire bed;
- PVC should not be incinerated at a low temperature; and
- There should be no smoke."

3.3.7 Monitoring on Health Care Risk Waste Management Activities

It refers to the process of observing Health Care Risk Waste Management Activities in all State health facilities.

3.3.7.1 Infection Prevention Control Committees

According to the Infection Prevention and Control Guideline (IPCG) of 2015 for the MOHSS, which become operational on the 29th of April 2015, "an Infection Control Committee (ICC) should be established for each healthcare facility with clear terms of reference and representatives from the essential clinical and support services. It is a decision making body with financial and administrative powers. There should be one Infection Prevention Control (IPC) Committee per hospital. At health centre, clinic and community level, the Primary Health Care (PHC) Supervisor will coordinate IPC activities and forms part of the ICC.

The representation should be from the following cadres but other members can be co-opted as needed:

- Administration preferably the Medical Superintendent (at National and Intermediate hospitals) and Senior Medical Officers (SMO) (at District hospital) to chair the IPC Committee;
- IPC nurse practitioners (clinical practice coordinator);
- Pharmacist;
- Environmental Health practitioners;
- Engineering/technologist for the hospital;
- Clinical equipment management;
- Sterile services managers / PHC supervisors;
- Laboratory technicians;
- Administrative control officers;
- Support services (cleaning, catering, laundry and maintenance);
- Clinical specialist representative from acute services; and
- Other members can be co-opted."

Functions of the IPC Committee

According to the Infection Prevention and Control Guideline (IPCG) of 2015 for the MOHSS "there must be monthly meetings which make at least one decision at each sitting of the IPC Committee to ensure that the IPC programme moves forward and that all challenges are addressed. Minutes of each meeting must be in writing and available for the Monitoring and

Evaluation (M&E) teams to inspect if required. The matters which are addressed by the IPC Committee are wide, but essentially the following are included:

- Surveillance;
- Audit;
- Risk Management;
- Training of health care workers;
- M & E;
- Outbreak investigation and report; and
- Recording and Analysis."

Overall Management Responsibilities

- Ensuring infection control is one of the priorities in their strategic approach to quality health care provision by assigning focal persons at all levels to ensure organisation wide infection control awareness and accountability;
- Committing themselves in monetary terms to support the continuity of the programme. (Resources for training, monitoring and evaluation);
- Diverting adequate resources to preventative measures and control. (surveillance and supply support);
- Ensuring regular representation of infection control on management meetings;
- Ensuring regular quality training of infection control staff and continuous training of staff at implementation level to optimise the quality of work performance;
- Contributing to the development, review and implementation of policies, guidelines and procedures; and
- Establishing an infection control committee with clear terms of references and representative of the widest spectrum possible at the level of services delivery.

According to the National Waste Management Policy of 2010, "... human resources are the most important element in the implementation of this policy. The Ministries' should ensure qualified personnel are in place to implement the waste management policy and interventions.

3.3.7.2 Infection Prevention Control Practitioner

According to the Infection Prevention and Control Guideline (IPCG) of 2015 for the MOHSS "healthcare workers delivering IPC programme should be dedicated to IPC, with a clear job description which allows them to function effectively in a specialist IPC role and with strong management backing and support. There should be at least one formally trained IPC clinical practitioner at every district hospital or for every 200-250 acute beds per facility. In cases where IPC practitioner have more than one role such as Occupational Health and/or Quality Assurance, the IPC practitioner must have dedicated number of hours per week to complete the necessary tasks as defined by the IPC committee. At health centre and clinic level, there should be IPC focal persons at each healthcare facility working closely with the District IPC practitioner, who should also be trained so that adequate technical support can be provided."

3.3.7.3 Training

According to the Infection Prevention and Control Guideline (IPCG) of 2015 for the MOHSS "training is the most essential part of an infection control management programme and should be aimed at all health care workers in the health establishment, with specific training for IPC staff. The information given must be evidence based and well referenced, applicable to the work environment and constantly updated with refresher courses. All health care workers from top management down to support services must have had at least a basic course in IPC and regular in-service training in IPC activities, to ensure that they understand and support the IPC programme. The level of training should be structured according to the level of competence expected of the health care worker. All training activities must be recorded by the MoHSS to identify those that have been trained and to highlight for further training."

3.3.7.4 Vaccination against Hepatitis

According to the Integrated Health Care Waste Management Plan of 2012, "... Viral Hepatitis B and Tetanus should be provided for all health-care personnel and waste handlers. Each HCF is required to conduct immunization for all newly employed staff. The HCFs should maintain and keep long term records of vaccination.

3.3.7.5 Protective clothing

According to Integrated Health Care Waste Management Plan of 2012, "... when handling HCRW, housekeeping staff and Waste Handlers should always be provided with and wear appropriate protective clothing. As a minimum the following should be provided: overalls, or industrial aprons, boots and heavy duty gloves".

According to Treasury Instruction KJ 0202 replenishment of protective clothing and uniform garments shall be done according to scale, subject to the following conditions:

(a) Garments shall be exchanged on the one for one basis;
(b) Used garments must be scrutinized to determine whether it's unserviceability is due to fair wear and tear;
(c) Garments which became unserviceable to neglected or misuse must be taken back and the value thereof must be recovered from the wearer;
(d) Under no circumstances shall any additional items be issued in access of the scale whether free of charge or against payment thereof;
(e) Garments are issued by means of issue vouchers whereby the issues are posted in the relevant folio's in the main ledger and recorded on the "Personal Kit record" of each members;
(f) Garments which are exchanged must be dully accounted for in the main ledger under the appropriate folio "unserviceable and in the "Personal Kit record" of the members concerned; and
(g) On termination of a member's services, all protective clothing and uniform garments must be accounted for on the appropriate folio "unserviceable" in the main register by means of a receipt voucher and all deficiencies shall be recovered.

CHAPTER 4

4. Findings

This chapter presents the findings on the management of HCRW. The audit criteria against which the findings were measured are outlined in chapter 3.

4.1 General findings

4.1.1 Staffing

The MOHSS could not provide an updated staff establishment to the auditors. The latest staff establishment was approved in 2003 and has not been updated since then.

4.1.2 Legal Framework and Guidelines

- **Public and Environmental Act, 2015 (Act No. 1 of 2015)**

The audit found that the IHCWMP of 2012 is in contradiction with Section 53(4) of the Public and Environmental Act, 2015 (Act No.1 of 2015) which states that "... a person may not burn waste either in public or private places or at a waste disposal site" whereas the IHCWMP of 2012 states that "... burning of HCRW should take place under strict supervision".

As a result there is no uniformity in the handling of HCRW and consequently affecting the proper management of HCRW.

- **Atmospheric Pollution Prevention Ordinance 11 of 1976**

The audit found that the Atmospheric Pollution Prevention Ordinance 11 of 1976 that deals with aspects of hazardous waste management is outdated and were not repealed at the time of the audit. The MoHSS indicated that the Pollution and Control and Waste Management Bill of 2003 under the mandate of the Ministry of Environment and Tourism which would repeal the Atmospheric Pollution Prevention Ordinance No. 11 of 1976 are not yet finalized. As a result, there are no integrated sustainable waste management practices in the country for role players to guide them on the management of waste.

- **Health Care Waste Guidelines**

The audit found that the MOHSS has developed and adopted the Integrated Health Care Waste Management Plan (IHCWMP) in 2012, and Infection Prevention Control Guideline in 2010. However, they are not fully enforced at the State health facilities visited, and the staff members interviewed in the Oshana region could not provide the auditors with the IHCWMP of 2012. As a result, there is no proper management of HCRW at the State health facilities visited.

4.2 Specific Findings

4.2.1 Health Care Waste Stream

4.2.1.1 Generation and Segregation of Waste

At the time of the audit, and through physical observations it was observed that the State health facilities visited in the Khomas, //Karas and Oshana regions with the exception of the Kunene region, the HCRW was not correctly segregated into different waste categories at the points of generation which is in contravention with the IHCWMP, despite training being provided. As a result, there is a mixture of HCRW with general waste which might pose a health risk to waste handlers and all those who come into contact with the waste when disposed-off. This is illustrated by the following pictures:

Picture 1: General waste disposed incorrectly in the red bag instead of the black bag

Source: OAG picture taken on 24/02/2016 at Katutura Intermediate Hospital

Picture 2: Hospital linen disposed incorrectly in the red bag instead of the green bag

Source: OAG picture taken on 25/4/2015 at Windhoek Central Hospital

Picture 3: Examination gloves disposed incorrectly in the black bag for general waste

Source: OAG picture taken on 08/3/2016 at Khomasdal Health Center

Infectious Waste

Physical observations revealed that except for the Oshakati Intermediate Hospital which had stock-outs, all the other State health facilities visited used the red color-coded bags for HCRW. However, the bags were not marked "INFECTIOUS" which is in contravention with the IHCWMP. This is illustrated by the following pictures:

Picture 4: Red bags not marked "infectious"

Source: OAG picture taken on 25/04/2015 and 08/3/2016 Katutura and Oshakati incinerator

Furthermore, the Oshakati Intermediate Hospital in the Oshana region used the green color-coded bags as an alternative and have designed labels for labelling in the absence of the biohazard stickers as per the IHCMP. However, the labelling was either not done at all for example at the maternity and casualty wards and if labelled, the designed stickers lacked a date of collection and were falling-off during handling. As a result, the waste might be wrongly collected and disposed-off and poses a health risk to waste handlers. This is illustrated by the following picture:

Picture 5: Designed labels fallen-off and green bags not labelled

Source: OAG picture taken on 03 & 04/02/2016 at Oshakati Intermediate Hospital

The audit further found that the State health facilities visited in all the regions were using various waste bins for collection (refer to picture 7) and the bags were hanged on the trolleys and oxygen cylinder bottles and some were placed in cartons as illustrated in the picture below.

Picture 6: HCRW bags attached on trolleys and oxygen cylinder bottles

Source: OAG picture taken at Keetmanshoop District Hospital and Okuryangava Clinic

It was also found during the physical observations, that the waste bins were not having lids, wheels and foot pedals which is in contravention with the IPCG of 2010. As a result, the health care workers are exposed to infectious waste during handling. This is illustrated by the following picture:

Picture 7: Carton boxes used as waste bins

Source: OAG picture taken at Kamanjab Health Center, Oshakati Intermediate Hospital and Ohandungu Clinic

At all the State health facilities visited, the bags were overfilled and not securely sealed with a tape or plastic tie when ¾ full to reduce the risk of spilling or breaking which is in contravention with the IHCWMP. As a result, this poses a health risk to waste handlers when they collect the wastes which are hand-picked and loaded onto trollies. This is illustrated by the following picture:

Picture 8: Bags overfilled with vials and spillage of blood on the floor

Source: OAG picture taken at Katutura Health Center, Oshakati Intermediate Hospital and Keetmanshoop District Hospital

Sharps

Physical observations further revealed that all the State health facilities visited in the regions were placing the sharps in the yellow sharps boxes as required. However, at Keemanshoop district hospital sharps boxes were more than ¾ full whilst it was placed on the floor and not sealed at all the State health facilities visited which contravenes the IHCWMP. As a result, this poses a health risk to health care workers who do not wear protective shoes and anybody who comes in contact with the sharp boxes.

This is illustrated by the following pictures:

Picture 9: Overfilled yellow sharps boxes

Source: OAG picture taken at Keetmanshoop District Hospital

Picture 10: Yellow sharps boxes on the floor

Source: OAG picture taken at Opuwo and Keetmanshoop District Hospitals

4.3 Collection of Waste

4.3.1 On and off-site Collection

The interviews revealed that HCRW is collected twice per day internally (hospital wards and screening rooms at clinic level) to the designated storage areas. However, it was further revealed that the collection of waste from the external health facilities' storage areas (those without incinerators or if non-functional) is not in compliance with the IHCWMP because the waste is collected weekly instead of within two days as required. This is due to a lack of exclusive designated vehicles for HCRW. As a result, bacteria growth and odors might not be prevented since there is no treatment of waste.

The audit further found through physical observations that HCRW is not collected with separate trolleys, neither are they marked with corresponding colors nor washed regularly which is in contravention with the IHCWMP. As a result, it could lead to cross-contamination during waste collection. This is illustrated by the following picture:

Picture11: Collection of HCRW from the wards

Source: OAG picture taken at Windhoek Central Hospital and Luderitz District Hospital

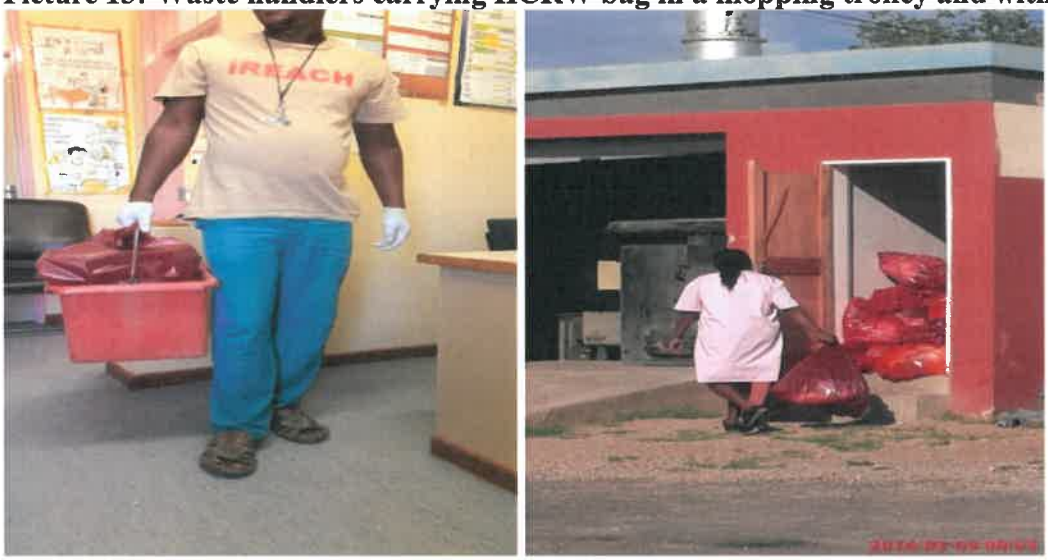
Picture 12: Trolleys used to collect both HCRW and general waste

Source: OAG picture taken at Oshakati Intermediate Hospital

4.3.2 On-site Transport

The audit found that all the other health facilities visited were having trolleys except Opuwo District Hospital, as well as all health centers and clinics. However, the trolleys were not sufficient except for the Oshakati Intermediate Hospital. Health facilities such as Luderitz District Hospital had only one trolley for waste collection whereas at the others, waste handlers were found transporting waste with hands or with equipment such as mopping trolleys which is in contravention with the IHCRWMP. As a result, this poses a health risk to the waste handlers during transportation of waste by using their hands. This is illustrated by the following picture:

Picture 13: Waste handlers carrying HCRW bag in a mopping trolley and with hands



Source: OAG picture taken at Opuwo District Hospital

4.4 On-site storage

The audit found that all the State health facilities visited have designated storage areas for HCRW but were not conforming to the requirements as stipulated in the IHCWMP of 2012 for example the storage area at Oshakati Intermediate Hospital is an open space and there were no warning signs to restrict unauthorized access.

Furthermore, the storage areas were not well managed because waste were:

- dumped in corridors, outside the cold storage, inside and outside the incinerators,
- stored together with general waste,
- spilled on the floors, and
- exposed to sun, rain and winds in open spaces.

This is illustrated by the following pictures below.

Picture 14: HCRW dumped outside the cold storage and stored together with general waste

Source: OAG picture taken at Katutura Intermediate Hospital and Keetmanshoop District Hospital

Picture 15: HCRW exposed to sun, rain and wind in open storage areas

Source: OAG picture taken at Oshakati Intermediate Hospital, Katutura and Khomasdal Health Centre, Ompundja and Okaukamasheshe clinics

It was also observed that all the other health facilities visited were not having cold storages except the Windhoek Central Hospital and Katutura Intermediate Hospital which have two and one respectively but one of the two cold storage facilities at the Windhoek Central Hospital was not functional since 2012. The audit found that HCRW is stored more than two days at the health facilities that do not have cold storages and incinerators.

This poses a health risk to waste handlers and lead to cross-contamination.

4.5 Off-site Transportation

The interviews and physical observations revealed that all the State health facilities visited except for Oshakati intermediate hospital, had no designated vehicles used exclusively to transport HCRW. The audit further found that HCRW were collected for incineration from the health facilities (those without incinerators or if non-functional) with any available vehicles such as pick-up bakkies, trucks and ambulances which were not disinfected. As a result, this poses health risk to health workers and patients as vehicles are used for multiple functions. This is illustrated by the following pictures:

Picture 16: A vehicles transporting HCRW for incineration

Source: OAG picture taken at Oshakati Intermediate Hospital and Opuwo District Hospital

The audit found that at all State health facilities visited except the Katutura Intermediate hospital, HCRW was transported from the health facilities (those without incinerators or if non-functional) without a consignment note. The reasons given were that the consignment note is not in place and the staff members responsible for the transportation and disposal of HCRW were not aware of the consignment note. As a result, waste cannot be tracked in order to determine the origin and type of waste at the incinerators.

4.6 On-site Treatment and Disposal of HCRW

Incineration

At the time of the audit, interviews and physical observations revealed that incineration was the standard method of treating HCRW for all State health facilities visited. All the incinerators were functional except for Opuwo and Keetmanshoop District hospitals. At the time of the audit, the incinerator at Opuwo District hospital was not functional for more than a month and the one at Keetmanshoop District hospital burned down. The incinerators at the Katutura Intermediate hospital were replaced with new ones.

It was further found that artisans in the Maintenance Division, MOWT do not conduct in-house routine maintenance and repair of incinerators. As a result, the MOHSS relies on a private contractor, Central Technical Supplies (CTS), which is the only service provider for maintenance of incinerators causing delays in the repair thereof.

Contingency plan

The audit found that the MOWT is responsible for a routine maintenance and contingency plans for health care risk waste as well as maintenance and repair of buildings, and equipment's including incinerators.
However, the auditors were not provided with the contingency plan by the MOWT despite the Ministry being required to develop it, by the National Waste Management Policy of 2010. As a result, the absence of the contingency plan for HCRW could cause the MOHSS to incur additional costs.

Burning of HCRW

It was found during the physical observations that the Oshakati Intermediate Hospital was burning HCRW at the municipal dump site even though the incinerator was functional.

As a result, burning of HCRW at municipal dump sites causes air pollution and poses a health risk to humans and the environment, as houses are located at the vicinity of the dump site and scavengers were also found at the site. This is illustrated by the following pictures below and also refers to picture 20.

Picture 17: HCRW disposed and burned at municipal dump site

Source: OAG pictures taken at Oshakati Municipal dump site

Physical observations further revealed that banned items such as spray cans and vials were found in the residue of the incinerated waste at all State health facilities visited except Katutura Intermediate Hospital due to poor segregation of waste at ward and clinic levels. As a result, burning restricted items expose operators to explosion and cause frequent break-downs of the incinerator. The following pictures illustrate the residue from the incinerators:

Picture 18: Residue from the incinerator

Source: OAG pictures taken at Kamanjab, Luderitz and Bethanie incinerators

Picture 19: Vials in the incineration ashes

Source: OAG picture taken at the Oshakati and Kamanjab incinerators

Furthermore, the signage boards were not displayed at the entrance of the incinerators at all State health facilities visited as required. As a result, there is no restriction for unauthorized access.

The physical observations revealed that all visited State health facilities with incinerators, except Katutura Intermediate hospital disposes residue from the incinerators on surface ground and shallow pits at the municipal dumping sites and hospital premises although sharps and vials were not completely destroyed. The interviews indicated that residue was disposed on surface ground and shallow pits because local authorities in the regions visited do not dig pits for the disposal.

On confirmation with the local authorities in the regions visited, it was indicated that the MOHSS never made a formal request to be provided with such a service.

As a result, residue poses a health risk to scavengers and children who might be injured by sharps as some are closely located to the municipal dumping sites. The following picture illustrates residues discarded on surface ground and shallow pits:

Picture 20: Discarded residue from the incinerators

Source: OAG picture taken at Oshakati Intermediate Hospital, Luderitz and Keetmanshoop District hospitals and Bethanie Health Centre

4.6.1 Waste Information System

At the time of the audit the Waste Information System at all visited State health facilities was not implemented as stipulated in the National Waste Management Policy of 2010. As a result, it could lead to poor planning of the HCRW management.

For the financial years under review, the audit found that none of the State health facilities visited were recording and generating statistics on waste generated at ward and clinic level.

The audit further found that HCRW bags and sharps boxes were counted and recorded manually at the incinerators at Katutura and Oshakati Intermediate, and Opuwo District hospitals. The audit found an inconsistency in the counting and recording of HCRW bags and sharps boxes recorded. The physical observations revealed that the cleaners were not recording the correct number of bags and sharps boxes brought to the incinerator in the logbook / manifest document. As a result, the audit could not establish how much HCRW is generated or incinerated at each health facility.

4.6.2 Loading Capacity

The audit found that, the incinerator operators at all visited State health facilities were not loading the bags in accordance with the prescribed guidelines.

During the physical observations the incinerator operators at Oshakati and Katutura intermediate hospitals were found loading four to five bags every two-to-three minutes into the combustion chambers instead of one full bag for every four minutes; or half a bag for every two minutes. Furthermore, the incinerator operators at Bethanie Health Centre were loading two full bags every fifteen minutes or one bag every five minutes instead of one full bag for every five minutes or one full bag for every two and a half minutes.

Weight Scales

The audit further found that incinerators at all visited State health facilities were not having weight scales as required by the IHCWMP of 2012. It was also advised by the suppliers to avoid overloading as it causes smoke as illustrated in the picture below. Smoke, due to overloading of the incinerators, is emitted into the environment which poses a health risk to those living in the vicinity of the incinerators. This is also illustrated by the following picture:

Picture 21: Emission of thick dark smoke from the chimneys at the incinerators

Source: OAG picture taken at Oshakati and Katutura Intermediate Hospitals.

- **Automatic Loading Device**

The audit found that the HCRW were loaded manually into the combustion chambers because the incinerators were not fitted with automatic loading devices as required by the IHCWMP of 2012. As a result, operators are exposed to extreme heat, toxic pollutants and explosives if ampoules explode, since all operators except at Katutura intermediate hospital and Bethanie Health Centre were not provided with the required protective clothing. This is illustrated by the following pictures:

Picture 22: Manual loading into a Combustion Chamber

Source: OAG picture taken at the incinerator near Katutura Intermediate Hospital.

Picture 23: Incinerator operators with no proper protective clothing

Source: OAG picture taken at Oshakati Intermediate Hospital and Luderitz District Hospital.

4.7 Occupational Health and Safety

4.7.1 Vaccination against Hepatitis B Virus

The IHCWMP of 2012 requires that Viral Hepatitis B and Tetanus should be provided for all health-care personnel and waste handlers. The audit found that, the Viral Hepatitis B vaccine were available at all State health facilities visited for the immunizations of all health care workers and waste handlers exposed to the Hepatitis B Virus (HBV), which are vaccinated in three doses of three intervals (1st dose all newly employed staff, 2nd and 3rd dose follow-up vaccinations after three and six months respectively). However, the data analysed revealed that not all health-care personnel and waste handlers that are exposed to the HBV had completed the three doses. The table below illustrates the vaccination statistics at Opuwo District Hospital:

Table 1: The number of health care workers and waste handlers vaccinated against Hepatitis B virus (HBV) for Opuwo District hospital

Financial Year	Total number of health workers and waste handlers exposed to potentially infectious material	Total number of health workers and waste handlers who completed the three doses	Percentage of of health workers and waste handlers who completed the three doses	Total number of health workers and waste handlers who completed the 1st and 2nd doses	Percentage of of health workers and waste handlers who did not yet completed the three doses
2012/2013	174	73	42%	101	58%
2013/2014	179	77	43%	102	57%
2014/2015	191	90	47%	101	53%

Source: Opuwo district hospital vaccination statistics.

The table above indicates a significant number of health care workers and waste handlers that did not complete the three doses of the Viral Hepatitis B vaccine. As a result, health care workers and waste handlers are exposed to the Hepatitis B virus infection.

Furthermore, the audit could not establish how many health care workers and waste handlers were vaccinated at all the other State health facilities visited because the information provided was incomplete.

4.7.2 Protective Clothing

At the time of the audit, it was found that the waste handlers replenished garments in accordance with Section KJ 0202 (a – g) of the Treasury Instructions. However, the audit further found that all State health facilities visited, 22 out of 26 waste handlers interviewed were not provided with protective shoes due to a lack of shoe sizes, when ordered from the internal storerooms. This poses a health risk to the waste handlers when getting in contact with sharp boxes. This is illustrated by the following pictures:

Picture 24: Waste handlers wearing private shoes

Source: OAG picture taken at Oshakati Intermediate Hospital, Ohandungu clinic, Luderitz District Hospitals and Aus Clinic.

4.8 Monitoring of Health Care Risk Waste Management Activities

4.8.1 Infection Control Committees

At the time of the audit, it was found that all the other State hospitals visited had an Infectious Control Committee established with clear terms of reference to ensure proper management of HCRW at State health facilities except at Windhoek Central hospital whereas the committees at Opuwo and Luderitz District Hospitals were dormant. As a result, there is improper coordination between units because the committees are not able to identify and prioritize needs for HCRW management.

4.8.2 Infection Prevention and Control Practitioner

At the time of the audit, all the other hospitals visited except Opuwo and Luderitz District hospitals were having an Infection Prevention Control Practitioner/Nurse as per the staff establishment of 2003 to manage infection control practices and provide training to health care workers and waste handlers on HCRW management.

The audit found through interviews that continuous training is not provided to health care workers and waste handlers on HCRW management at all the State health facilities visited. As a result, healthcare workers and waste handlers are not continually educated and updated on HCRW management practices which could lead to improper management of HCRW.

4.8.3 Environmental Health Officers

At the time of the audit, all the State health facilities visited were having Environmental Health Officers at Regional level as per the staff establishment of 2004 to manage environmental health services and conduct inspections on how HCRW is generated, segregated, stored and disposed at State health facilities and regions. However, the audit could not establish whether the inspections were conducted at all the State health facilities visited except Oshakati Intermediate Hospital due to a lack of information.

Furthermore, at the time of the audit it was found that the recommendations by the Environmental Health Practitioners at Oshakati intermediate hospital were not implemented by the hospital management. As a result, there is improper management of HCRW.

CHAPTER 5

CONCLUSION

The IHCWMP and the Public and Environment Act are in contradiction with regard to the burning of HCRW waste.

The Atmospheric Pollution Prevention Ordinance 11 of 1976 dealing with the aspects of hazardous waste management is outdated.

The State health facilities are not complying with the National Waste Management Policy (NWMP) of 2011, Infection Prevention and Control Guideline (IPCG) of 2012 and the Integrated Health Care Waste Management Plan (IHCWMP) of 2012 because there is no uniformity in the management of Heath Care Risk Waste (HCRW). These are summarized as follows:

- There is no proper waste segregation at ward (hospital level) and clinic levels;
- The collection of HCRW from the external State health facilities' storage areas (those without incinerators or if non-functional) is done weekly instead of within two days;
- There were no separate trolleys for the removal of HCRW bags and those were transported on-site with inappropriate trolleys or by hand;
- The storage facilities did not conform to storage requirements as stipulated in the IHCWMP;
- Five out of six State hospitals visited have no designated vehicles exclusively to transport HCRW; and
- The HCRW is not properly treated and disposed-off at all State health facilities visited.

CHAPTER 6

RECOMMENDATIONS

The MOSHSS should ensure that the IHCWMP and the Environmental Act are harmonized.

The MOHSS should follow-up on the Pollution Control and Waste Management Bill of 2003 with the Ministry of Environment and Tourism in order to repeal the Atmospheric Pollution Prevention Ordinance 11 of 1976.

The Ministry of Health and Social Services (MOHSS) should put measures in place to ensure that all State health facilities are conforming to the policy and guidelines with regard to segregation, storage, on-site and off-site transportation, treatment and disposal of Heath Care Risk Waste.

ANNEXURE A: PHYSICAL OBSERVATIONS CONDUCTED

Area Visited	Maternity Ward	Casualty Ward	Theatre Ward	Dressing Room	Consulting Rooms	HCRW Storage Areas	Incineration Areas	HCRW Disposal Areas
Khomas Region								
Katutura Intermediate Hospital	x	x	x			x	x	
Windhoek Central Hospital	x	x	X			x		
Khomasdal Health Centre				x	x	x		
Katutura Health Centre				x	x	X		
Okuryangava Clinic				x	x	x		
Oshana Region								
Oshakati Intermediate Hospital	x	x	x			x	x	x
Ondangwa Health Centre				x	x	x		
Ompundja Clinic				x	x	x		
Okaukamasheshe Clinic				x	x	x		
Kunene Region								
Opuwo District Hospital	x	x	x			x	x	x
Kamanjab Health Centre				x	x	x	x	x
Orumana Clinic				x	x	x		
Ohandungu Clinic				x	x	x		
//Kharas Region								
Keetmanshoop	x	x	x			x	x	x

District Hospital								
Luderitz District Hospital	x	x	x			x	x	x
Bethanie Health Centre				x	x	x	x	x
Keetmanshoop Clinic				x	x	x		
Aus Clinic				x	x	x		

ANNEXURE B – Interviews Conducted

NUMBER	POSITIONS
4x	Regional Directors;
4x	Medical Superintendent;
2x	Senior Medical Superintendent;
4x	Matrons;
2x	Control Environmental Health Officers / Practitioners;
2x	Chief Environmental Health Officers / Practitioners;
2x	Focus group Environmental Health Officers / Practitioners;
1x	Assistant Environmental Health Officer / Practitioner;
5x	Infection Prevention and Control Nurses;
3x	Senior Registered Nurses;
15x	Registered Nurses;
5x	Enrolled Nurses;
5x	Leader Cleaners;
21x	Cleaners;
7x	Administrative Officers; and
7x	Incinerator Operators
STAKEHOLDERS	
1x	Managing Director: Central Technical Suppliers; and
5x	Maintenance Officers: Ministry of Works and Transport

ANNEXURE C - DOCUMENTS ANALYZED

Number	Document Analysed	Information Obtained
1.	Checklist for waste violation management;	To determine if there is violation on HCRW management with regard to segregation, storage and disposal of HCRW at State health facilities.
2.	Environmental health officers' quarterly reports;	To determine if the Environmental health officers are conducting environmental health services and inspections on how HCRW is generated, segregated, stored and disposed of at State health facilities.
3.	Hepatitis B vaccination data;	To determine if health workers and waste handlers exposed to potential HBV infections are vaccinated and completed the three doses as required.
4.	Infection control committee minutes;	To determine if the Infection control committees are ensuring proper management of HCRW at State health facilities.
5.	Infection Prevention and Control Guideline of 2012;	Criteria
6.	Inspection and annual reports by the Infection Prevention and Control Nurse for the 2013/14 and 2014/15 financial years;	To determine if the Infection Prevention and Control Nurse are conducting inspections on how HCRW is generated segregated, stored and disposed at State health facilities.

7.	Integrated Health Care Waste Management Plan of 2012;	Criteria
8.	Internal memorandums on HCRW management;	To determine the information shared internally by the Infection Prevention and Control Nurse on HCRW management practices and challenges.
9.	Internal requisition forms for color-coded bags;	To determine if State health facilities are provided with the number of requested color-coded bags from the internal store room.
10.	Job descriptions for staff members;	To determine the roles and responsibilities of staff members with regard to HCRW management.
11.	National Waste Management Policy of 2011;	Criteria
12.	Purchase order and claim forms for protective shoes from Government Store;	To determine if State health facilities are provided with the number of requested shoe sizes from the Government Store.
13.	Quarterly progress review matrix for 2012/13; 2013/14 and 2014/15;	To determine if State health facilities are achieving their targets as per management plans.
14.	Quick operating guide for incinerators;	To determine the prescribed loading capacity of the incinerators and if operators are adhering to them.
15.	Service request for the repair of incinerators; and	To determine if the service requests by the State health facilities have been executed and completed.
16.	Staff establishment for the Ministry of Health and Social Services; and	To determine if all positions related to HCRW management are filled.

ANNEXURE D: ORGANIZATIONAL STRUCTURE OF THE MOHSS