

REPORT ON HCRW GENERATION AND TREATMENT FIGURES 2013 – 2018

1. PURPOSE

To provide a report on healthcare risk waste (HCRW) generation and treatment figures 2013 – 2018.

2. BACKGROUND

In 2005, the then Department of Environmental Affairs and Tourism (DEAT), as part of the National Waste Management Strategy (NWMS, 1999) undertook a study on the generation and treatment of health care risk waste (HCRW)¹. This study included a projection of the volume of HCRW generated as well as the available treatment capacity in South Africa. According to the study approximately 28 000 tonnes was generated, with 88% treated by commercial service providers and the remaining 12% at facilities located within public or private hospitals which were either authorised or unauthorised. The authorised capacities were 37 561 tonnes per annum for commercial service providers and 64 tonnes per annum for hospitals, this compares with the projected quantities of 28 000 tonnes which gives an excess capacity of 10 000 tonnes per annum or an additional 36%.

In 2008 a study was published by the Department of Environmental Affairs (DEA) on the total volume of HCRW generated across the South Africa². The volume was estimated to be 42 200 tonnes with a treatment capacity of 52 350 tonnes spread between non-burn and incineration facilities (including facilities that do not have air-emission control mechanisms in place). It was also anticipated that an additional 36 860 tonnes would become available by the end of 2008, providing a total treatment capacity available as 89 210 tonnes.

Despite the spare treatment capacity available the sector was plagued by various incidents including illegal dumping, persistent shut down of operations, delays in payments of service providers resulting in stockpiling of waste on site, uneven playing fields in terms of tender specifications, non-compliance with legislation, poor segregation within healthcare institutions as well as uncooperative behaviour within the industry towards each other. As a result, the Department received and processed a number of applications to landfill untreated HCRW with the reasons provided as lack of available treatment capacity.

DEA responded by introducing a number of initiatives to deal with the issues which have included:

- development of a contingency plan dealing with disposal of untreated HCRW;
- establishment of a DEA-DoH task team meeting on a quarterly basis;
- reviewing the waste management licences of treatment facilities;
- inspections on treatment facilities; and
- establishment of a HCRW sector forum that meets on an annual basis.

In addition, the DEA has also introduced the requirement for treatment facilities to provide monthly reports on the volumes received and treated on site as well as the requirement for facilities to inform the DEA of any interruptions (planned or unplanned) resulting in operations ceasing for longer than eight (8) hours. This has allowed the DEA to anticipate and plan for potential shortages of treatment capacity. Since initiating the mechanisms above the treatment sector has demonstrated a significant improvement in operations. The last approval for disposal of untreated HCRW resulting from a lack of available treatment capacity was in 2015.

3. OBJECTIVE

This report aims to provide generation and treatment figures for the period 2013 – 2018 providing the DEA with information on the current state of HCRW management in South Africa.

4. INTRODUCTION

Health care waste (HCW) is waste generated in healthcare facilities, research institutions, laboratories, care facilities and households. It also includes waste generated from non-healthcare professionals including beauty salons, tattoo parlours etc. HCW is further divided into health care risk waste (HCRW) and health care general waste (HCGW).

4.1 Health care risk waste

HCRW is defined as any waste which is produced in the diagnosis, treatment or immunisation of human beings or animals, or waste that has been in contact with blood, body fluids or tissues from humans, or infected animals from veterinary practices. There are different categories/ types of HCRW as can be seen in table 1 below.

¹ Department of Environmental Affairs and Tourism, 2006. National Waste Management Strategy Implementation South Africa. Projections for Health Care Risk Waste Treatment. DEAT Report Number: 12/9/6.

² Department of Environmental Affairs and Tourism, 2008. Survey of Generation Rates, Treatment Capacities and Minimal Costs of Health Care Waste in the 9 Provinces of RSA.

Table 1: Types of Health Care Risk Waste

Type	Description	Major generators
Chemical waste	Discarded solid, liquid and gaseous chemicals used in providing a health care service.	Hospices
Infectious non-pathological waste	Waste which contains or may be reasonably presumed to contain infectious agents in sufficient concentrations or quantities to cause disease in susceptible hosts.	Blood banks and collection services
Laboratory waste	Waste generated from laboratory work that contains or may be reasonably presumed to contain infectious agents in sufficient concentrations or quantities to cause disease in susceptible hosts.	Animal research centres
Pathological waste	Includes human tissues, organs, body parts; placentas, blood and blood products; non-viable foetus; and deceased animals or animal body parts infected with zoonotic disease.	Mortuary and autopsy centres
Pharmaceutical waste	Expired, unused, spilt or contaminated pharmaceutical products, drugs, vaccines and sera which are no longer usable in human or animal treatment and includes items contaminated by or items contaminated with cytotoxic drugs.	Emergency medical care services
Radioactive waste	Solid, liquid, and gaseous materials contaminated with radionuclides, including waste produced as a result of procedures such as in-vitro analysis of body tissue and fluid, in-vivo organ imaging and tumour localization, and various investigative and therapeutic practices.	Dialysis centres
Sharps waste	Waste having acute rigid corners, edges or protuberances capable of cutting, piercing or puncturing.	Pharmacies
		Medical research institutions
		Minor generators
		Convalescent nursing homes
		Psychiatric hospitals
		Cosmetic salons
		Tattoo parlours
		Funeral services
		Ambulance services
		Home-based care
		Dental clinics
		Alternative health healers
		General Practitioners
		Veterinary Services
		Accident scene clean-up contractors
		Frail care centres

4.2 Health care general waste (HCGW)

HCGW is the non-hazardous component of HCW and is generated from housekeeping, kitchen and administrative functions within healthcare facilities and includes paper, cardboard, food, flowers, cans, glass etc. HCGW makes up between 75% and 90% of the waste produced by health care providers.

5. SOURCES OF HCRW

There are many different sources of HCRW and generators can be viewed as major or minor generators depending on the daily volume produced (Table 2). Major generators include all generators that generate more than 20 kilograms a day. Minor generators include all generators that generate less than 20 kilograms a day but do not include domestic generators. Examples of sources are listed in Table 2.

Table 2: Examples of major and minor generators

Major generators
Hospitals
Community Health Centres
Outpatient and mobile clinics
Obstetric and maternity clinics

6. IMPACTS ASSOCIATED WITH HCRW

The general waste fraction of HCW, which constitutes the larger component of HCW, is similar to municipal waste and would not pose any higher risk than household waste. The hazardous fraction of HCW i.e. HCRW needs to be managed in an environmentally sound manner so that the potential health and environmental risks associated with the waste are minimised.

The presence of any of the following result in the hazardous nature attributed to HCRW:

- Infectious agents
- Hazardous chemicals
- Radioactivity
- Sharps
- Cytotoxic or genotoxic constituent

Exposure could be caused through a variety of routes such as punctures, abrasions or cuts in the skin, inhalation through mucous membranes and ingestion. All individuals exposed to HCRW are potentially at risk, including those within health care institutions, waste contractors who collect, transport and manage this waste, and those who are exposed to it as a consequence of careless management and illegal disposal.

The major groups of persons at risk include:

- Doctors and nurses
- Patients

- Visitors
- Workers at the healthcare facility
- Workers collecting and transporting the waste
- Informal waste pickers
- Workers at waste management facilities
- Public (in cases of illegal dumping, accidents etc.)

7. GENERATION RATES

In 2019 a questionnaire was circulated to the nine provincial Departments of Health (PDoH) requesting information on the volume of HCRW generated within each province for the period 2016 – 2018. This followed on a similar questionnaire that was circulated in 2016 to gather the generation figures for 2013 – 2015. Although all nine provinces responded to the initial request in 2016 and provided the generation figures, only six of the provinces responded in 2019, namely Eastern Cape; Gauteng; Limpopo; Northern Cape and Western Cape. As such an annual increase has had to be estimated and applied to the three provinces that did not provide the figures i.e Free State, Kwazulu-Natal and North West. The increase rate applied (3%) was based on the average increase in volumes of HCRW reported as treated by the licensed HCRW treatment facilities. Kwazulu Natal generated the largest volume of HCRW followed by Gauteng and Eastern Cape. The Northern Cape was the smallest generator, averaging at 386 tonnes per annum. Figure 1 illustrates the percentage generated per province in 2018.

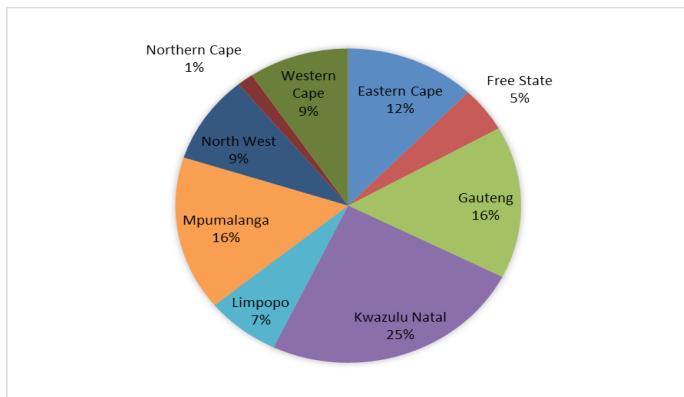


Figure 1: 2018 Percentage contribution from public health care facilities per province to generation rates

In 2019 a similar questionnaire was circulated to the four major private healthcare generators namely; MediClinic; Netcare; NHN and Life Healthcare, requesting information of the volume generated by each group for the period 2017-18. The highest generation rates were in Gauteng, followed by Kwazulu Natal and Western Cape. As per the public healthcare facility generation rates, Northern Cape was the smallest generator.

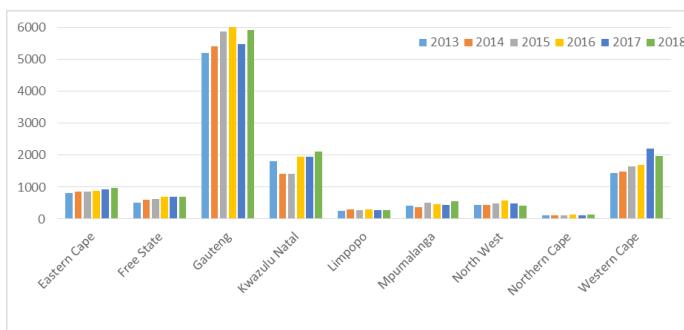


Figure 2: HCRW generation figures for private healthcare facilities 2013 - 2018

On comparison of the 2018 generation rates, the private sector accounts for 34% of the waste generated and the public sector accounts for 66%.

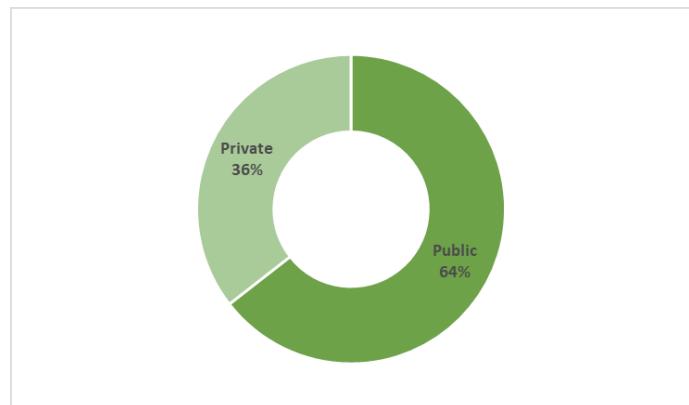


Figure 3: Contribution by public and private sector to generation figures in 2018

A comparison of the 2005, 2008 and 2018 generation figures is provided in Table 3. The generation rates in both the public and private facilities have demonstrated an overall decrease of 10% since 2008. The private sector generation rates have decreased by 20% whilst the public sector generation rates have decreased by 4%.

Table 3: Generation volumes 2005, 2008 and 2018

PROVINCE	INSTITUTION TYPE	2005 FIGURES (Tonnes)	2008 FIGURES (Tonnes)	2018 FIGURES (Tonnes)
EASTERN CAPE	PUBLIC	2540	3400	2990
	PRIVATE	870	1100	977
FREE STATE	PUBLIC	1127	1270	1136
	PRIVATE	495	630	693
GAUTENG	PUBLIC	3395	4150	3846
	PRIVATE	4141	5750	5929
KWAZULU NATAL	PUBLIC	4405	5770	6041
	PRIVATE	1031	2210	2112
LIMPOPO	PUBLIC	1846	2030	1707
	PRIVATE	87	120	282
MPUMALANGA	PUBLIC	1040	1390	3897
	PRIVATE	333	450	562
NORTHERN CAPE	PUBLIC	1253	1680	372
	PRIVATE	393	530	145
NORTH WEST	PUBLIC	1142	1470	2233
	PRIVATE	260	350	421
WESTERN CAPE	PUBLIC	2072	2080	2310
	PRIVATE	1443	2970	1979
TOTAL	PUBLIC	18820	23240	23781
	PRIVATE	9053	14110	13103
	All	27873	37350	36884

It must be noted that the above figures do not include the volume of HCRW generated by the Department of Defence (DoD), the mining sector or by small generators such as dentists, doctors, pharmacies, veterinarians etc. If the volumes indicated in the 2008 DEA report are used and an annual increase of 1.5% is applied (in line with annual population growth) to generation rates then it is estimated

that an additional 5 600 tonnes of HCRW would have been generated by this sector, increasing the generation figures to 42384 tonnes.

8. Treatment of HCRW

8.1 Number of licensed and operating HCRW treatment facilities

HCRW is required to be treated prior to final disposal at a landfill. Treatment technologies are differentiated into two categories, namely incineration and non-burn technologies. As of December 2018, and based on the number of HCRW treatment facilities licensed in terms of the National Environmental Management: Waste Act (Act No 59 of 2008), there were 18 facilities in operation. Of the 18 facilities, nine (9) were incineration technologies and 10 were non-burn technologies. The treatment facilities were spread across the country as indicated in Table 4. The discrepancy in numbers is where a facility has installed and operates two different technologies on the same site.

Table 4: Number of licensed and operating HCRW Treatment Facilities as of December 2018

Province	Number of non-burn treatment facilities	Number of incineration facilities
Eastern Cape	1	
Gauteng	5	6
Kwazulu Natal	2	
North West	1	1
Western Cape	1	2

8.2 Volume of HCRW treated 2013 - 2018

All licensed treatment facilities that were operating were required to submit monthly reports to the Department indicating the volume of HCRW treated on site as well as the volume sent off site for treatment and/or disposal. The monthly reports have been submitted since 2013 and are summarised in Figure 4 below.

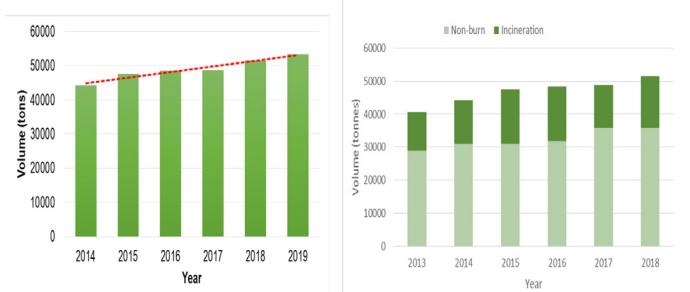


Figure 4: Volume of HCRW reported as treated for 2013 - 2019

On average 69% of the HCRW is treated via non-burn whilst 31% is treated via incineration. A comparison of the generation figures provided by the provincial DoH and the four private health care groups with the treatment figures provided by the licenced HCRW treatment facilities indicates that there is a relevant large volume (approximately an additional 10 – 12000 tons) of additional HCRW being received and treated by the facilities. It is assumed that this waste is emanating from the small generators such as dentists, doctors, pharmacies, veterinarians etc; the mining sector as well as from the Department of Defence (DoD), all of whom are not captured in the generation figures from public and private healthcare facilities.

9. Conclusion

The report provides a summary of HCRW generation and treatment figures recorded for 2013-2018 with the public sector accounting for 64% of the waste and the private sector 36%. The majority of the waste was treated by non-burn. However, it must be noted that the generation figures in this report do not include those from the Department of Defence, the mining sector or by small generators. Future work will need to be conducted to determine the contribution made by these generators.

