

## Medical Waste Disposal Practices in some Hospitals and Clinical Laboratories in the Accra Metropolis (Ghana)

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### Abstract

The improper handling or waste disposal of medical waste generated can pose serious health risk to the generator, solid waste collector and landfill personnel, and everyone in the community. Medical waste practices were assessed in some medical laboratories in the Accra metropolis. This includes some of the hospital and clinical laboratories through the use of questionnaires and onsite inspection. It was observed that, most of the laboratories were not aware of the EPA recommendations, while only a few segregate their waste before disposal. Most of them just pour their liquid waste down the drain without any treatment. The trucks used for disposal purposes do not carry the required biohazard sign. In conclusion waste disposal practices were in contravention of the EPA recommendations. This requires urgent attention and an appropriate punitive bill to sanitize the sector.

**Keywords:** *medical waste, hospital/clinical laboratories, disposal policies, environmental protection agency (EPA)-,Ghana*

### 1. Introduction

Medical waste is generally described as any solid/liquid waste that is generated in the course of diagnosis, treatment, or immunization of human beings, or animals, in research pertaining to, or in the production or testing of biological materials (EPA, 2005; OSHA, 1991), including but not limited to: -Blood-soaked bandages ;-culture dishes and other glass wares ;-discarded surgical gloves after surgery, discarded surgical instruments such scalpels, needles used to give shots or draw blood, cultures, stocks, swabs used to inoculate cultures, removed body organs like tonsils, appendices, limbs –(MWT, 1988).

Though not all medical waste are hazardous some waste from healthcare or medical facilities are high risk, hazardous and can affect human health as well as pollute the environment. In a working environment where poor health care waste management practices are the norm, exposure to infectious wastes due to blood borne pathogens could predispose healthcare workers, patients, and clients to infections (Johannessen *et al.* 2000; Sawalem *et al.*, 2009; Pruss *et al.*, 1999; Akter, 2000).

Some unsafe practices include dumping of waste without treatment into simple pits or placing them into open garbage bins on the roads. Some studies in Ethiopia and Nigeria confirm these practices in developing countries (Deneke *et a.*, 2011; Abah & Ohimain, 2011).

The improper handling and disposal of medical waste generated can pose serious health risk to the generator, solid waste collector, landfill personnel, and everyone in the community (UNM Anon).

It is unlawful to dispose off medically generated waste in a refuse container in countries, like the USA, Canada and the United Kingdom (Ramukowski, 1999).

What about Ghana? It is common knowledge that waste from some laboratories and clinics are disposed off directly by the Accra metropolitan authority (AMA) using private refuse trucks. It is questionable if the waste generated in the medical sector is properly handled, treated and discharged.

Though the EPA (Environmental Protection Agency) is responsible for policy drafting and implementation, they have no established policies or legislation on how medical waste is to be handled, except laws and

regulations pertaining to the environment and health (EPA 2002).

## 2. Materials and Method

This exercise was first carried out in Accra in 2006 and repeated in 2013, and also in three other cities and towns in 2007 and 2008 (Tema, Ho, Kumasi) in Ghana. These findings are based on the 2006 results since there was no significant departure from the earlier findings. There are almost 150 medical laboratories, both private and public in Accra. Forty-one of these laboratories gave their consent knowing that the work was purely academic and their confidentiality assured. The targets were the supervisors of the various laboratories, The survey targeted only how liquid and solid waste was handled before disposal and modes of disposal. Demographic information were not sought neither was their knowledge about waste management.

Questionnaires were prepared based on the recommendations of the EPA (Ghana) which is based on World Health Organization (WHO) guidelines. The questionnaire was prepared in English and required no translation since the primary language of instruction in all schools levels in Ghana is English. The questions were biased towards their respective waste policies and how they handle liquid and solid waste from their respective laboratories before discharging them and onsite inspection of their practices. The findings are listed below.

## 3. Results and Discussions

Out of the 41 laboratories sampled, 10% gave no response or idea about having a waste disposal policy, while 2% had no waste policy, and 88% had a waste disposal policy. The statistics gave an indication of a higher number of the laboratory management knowing the importance of having a waste disposal policy. Sixty-six percent of the laboratories indicated a waste policy change within the last three years, but only 30% of these could give reasons leading to the changes (fig.1).

With respect to the oversight agency on their waste disposal, 61% claimed, there is no organization overseeing how they dispose off their waste; 37% indicated that it is the AMA, while 2% indicated AMA and EPA. The above observation is disturbing, because it is quite apparent that, these laboratories do not really have any contact with the EPA. It is also an indication that the laboratories are not observing the EPA regulations. This observation is not the best for a developing country like Ghana (fig.2).

As to the number of times the oversight organization visits the premises, 20% indicated weekly, while 2% indicated biweekly, 20% monthly; 7% quarterly; 2% yearly, 25% gave no response, and another 20% indicated daily. It is possible that those who indicated daily and weekly, misconstrue the question to imply the number of times their waste are conveyed away from their premises (fig.3).

Fifty-six percent of the laboratories claimed to be paid surprise visits by either the EPA or the AMA; 15% claimed to be notified of an intended visit. 7% claim to experience both surprise and notified visits. 22% gave no indications of whether they are notified or paid surprise visits (fig.4).

All the laboratories indicated that syringes were incinerated or place in puncture proof containers.

Again all the respondents indicated a similar treatment of spoiled cotton and bandages. 37% claimed human tissues were placed in containers and incinerated. Sixty percent gave no indication whatsoever. Though the EPA guidelines recommended certain colors of the waste containers for certain materials, it was observed that, mostly every waste was placed in black rubber bags prior to disposal, though the EPA recommended black bags for general waste while yellow bags are recommended for infectious waste such as those generated in hospitals and medical laboratories. This observation implies that part of the guidelines is not being adhered to (fig.5).

All the laboratories indicated that their liquid waste was poured down the drain through the sink. Only 10% diluted the liquid waste or disinfected it, while 90% just poured the liquid waste down the drain without any treatment. This is a direct infringement on the EPA recommended guidelines. It is obvious that if proper monitoring is done as suggested, these practices will cease. The health hazards posed by this practice is significant, in that, there is no proper sewerage system in the Accra metropolis, secondly some of the water

from the drains are used by gardeners to water vegetables like, carrots, lettuces, cabbages, etc (fig.6).

Fifty-four percent of the laboratories have their sinks connected directly to the main drain running through the community. While 44% do not have such connections. 2% of the respondents did not give any response to questions on this aspect. This observation is not the best because there is a high possibility of the pathogenic and other liquid waste being disposed off down the drain without any dilution or disinfection. This is confirmed by the previous observation that only 10% of the respondents dilute or disinfects their liquid waste (fig.7).

Seven percent of the laboratories claim their sinks connect directly to the drain in the community. 39% had it connected to a septic tank, and 54% were not connected. Fifty percent of the 36, whose drains are connected to a septic tank, said they treat the waste in the tank before discharging it, in accordance with the EPA recommendations. 44% do not treat the waste in the tank. 6% gave no response. This observation poses a threat to the environment (fig.8).

Almost all (85%) of the respondents indicated that it was AMA trucks that transport their waste away, while 15% indicated that it was other waste disposal trucks. This observation was in contravention of EPA recommendations because none of these truck had a biohazard label, neither are they set aside solely for medical waste transportation (fig. 9).

Forty-one percent of the laboratories participating in the exercise had incinerators. 54% did not have. 5% gave no response. It was mostly the government hospital laboratories that had incinerators. A serious issue arises when waste requiring incineration is generated (fig.10).

#### 4. Conclusion

In the assessment of the Medical waste disposal practices in 41 laboratories made up of 31 private medical laboratories and 10 hospital laboratories in the Accra metropolis- it can be concluded that only a handful of laboratories are operating according to the guidelines of the EPA (Ghana), as a result of the following observations:- Almost all the laboratories (88%) have waste disposal policies, except about 12%. Sixty-one percent could not identify the agency overseeing their activities. Most of the laboratories gave varying visiting schedules from AMA and EPA officials, ranging from daily to monthly. Fifty six percent indicated that they experience surprise visits by the monitoring agencies, while 14% claimed they are notified. Ninety percent of the laboratories discharge their liquid waste into the drains without treatment, while only 31% have septic tanks and 50% treat the contents of the septic tank. This is a serious infringement of the recommendation of the EPA. Eighty-five percent of this laboratories indicated that AMA trucks are responsible for the removal of their waste. However, these trucks carry no biohazard symbols as required by the EPA recommendations, which is required to identify them from general waste trucks. Only 41% of the laboratories have incinerators, of which the majority is government hospital laboratories. These findings are in agreement with similar works carried out in other African countries which indicated that inadequate management practices are often implemented in most healthcare facilities particularly in developing countries (WHO 2004; Patwary 2009). Many findings in developing countries on healthcare wastes management revealed that segregation, collection of waste using recommended color coding container and storage of waste in isolated area were not satisfactory (Mostafa *et al.*, 2007; Coker, *et al.*, 2008, & (Patwary, 2011).

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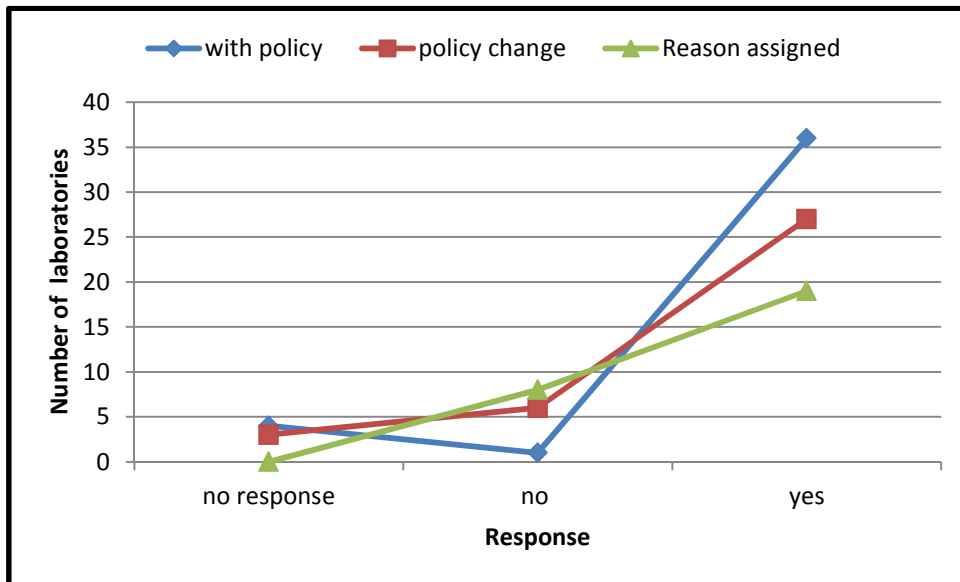


Figure 1: Distribution of laboratories with or without waste policies

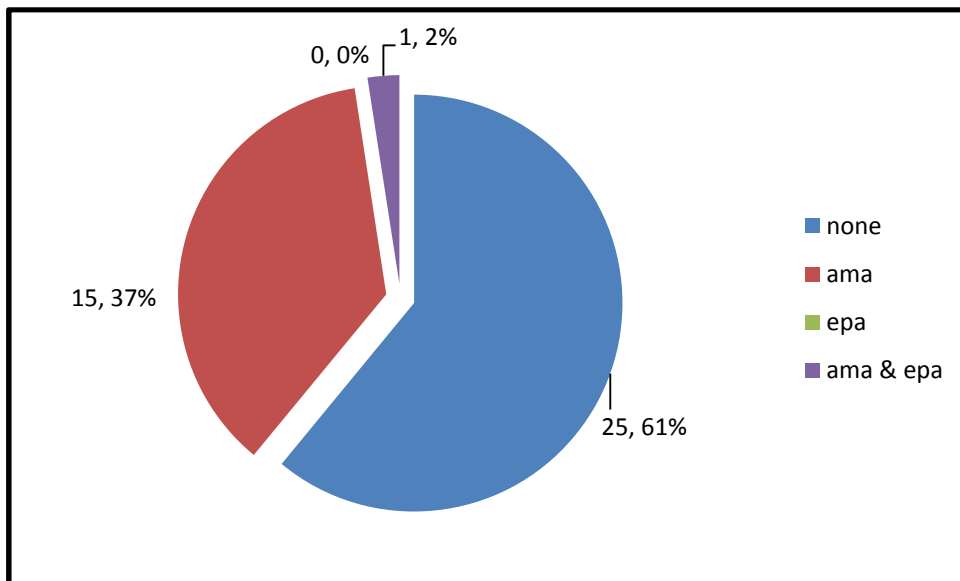


Figure 2: Organizations with oversight responsibilities

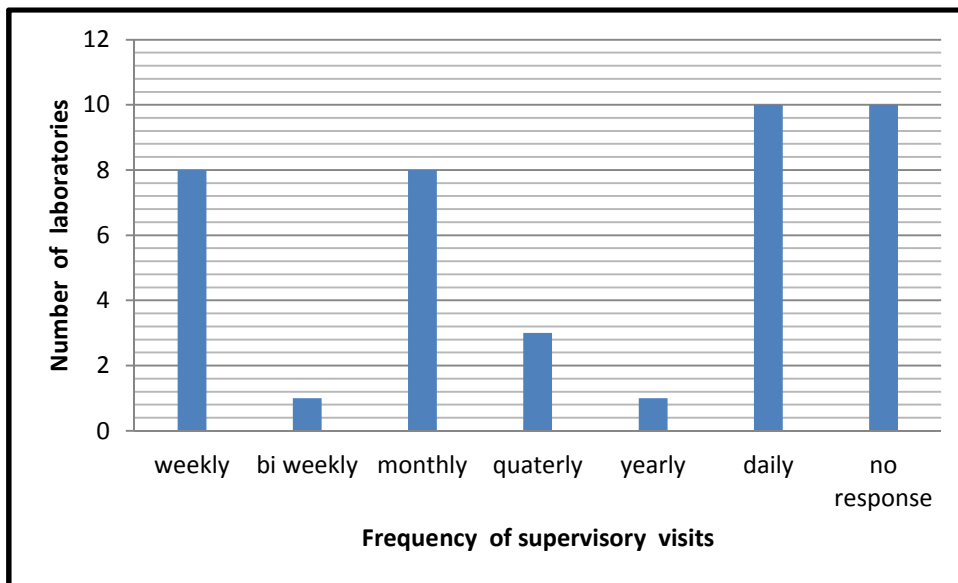


Figure 3: Frequency of visits by supervisory Agency

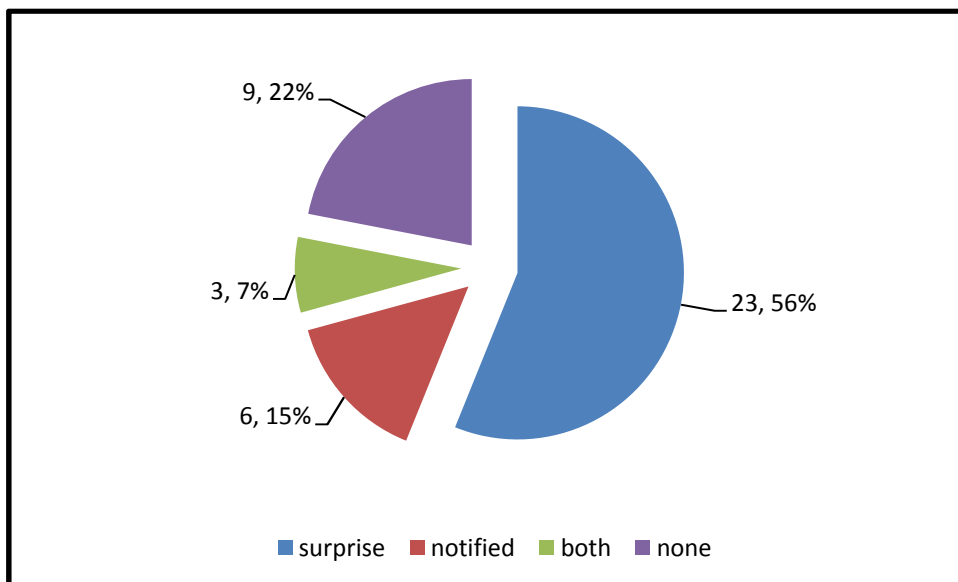


Figure 4: Types of supervisory visits experienced by the various laboratories

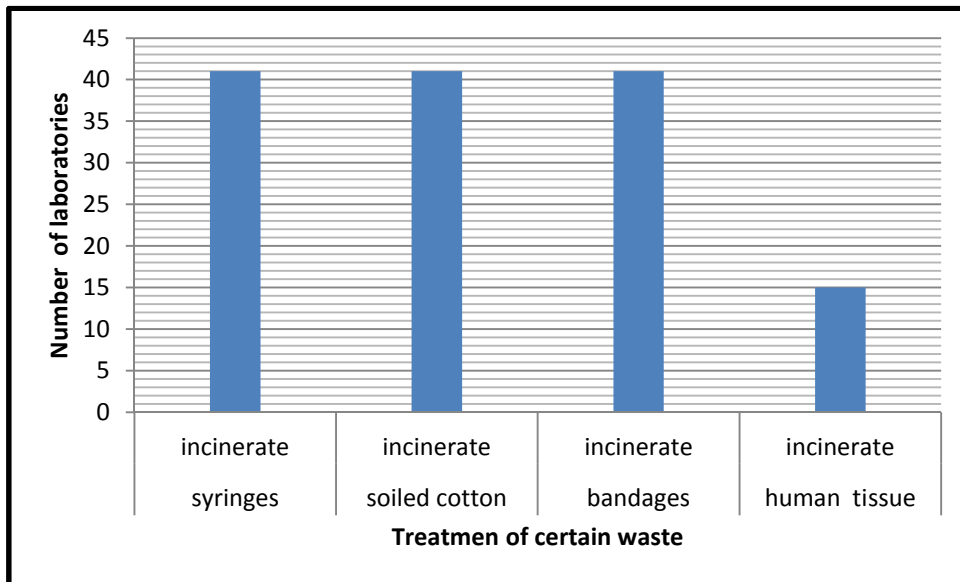


Figure 5: Some solid waste treatment in some clinical laboratories

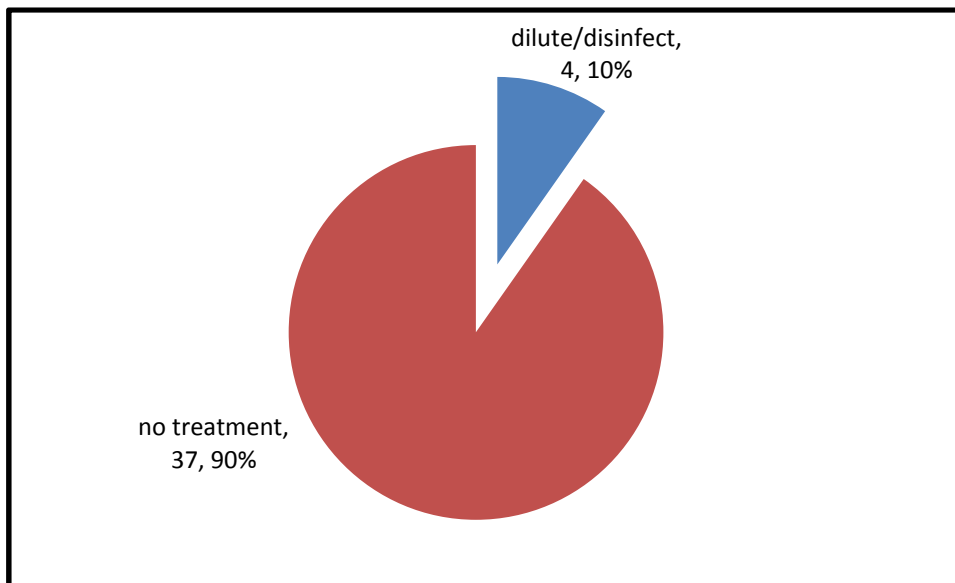


Figure 6. Treatment of liquid waste in the clinical laboratories.

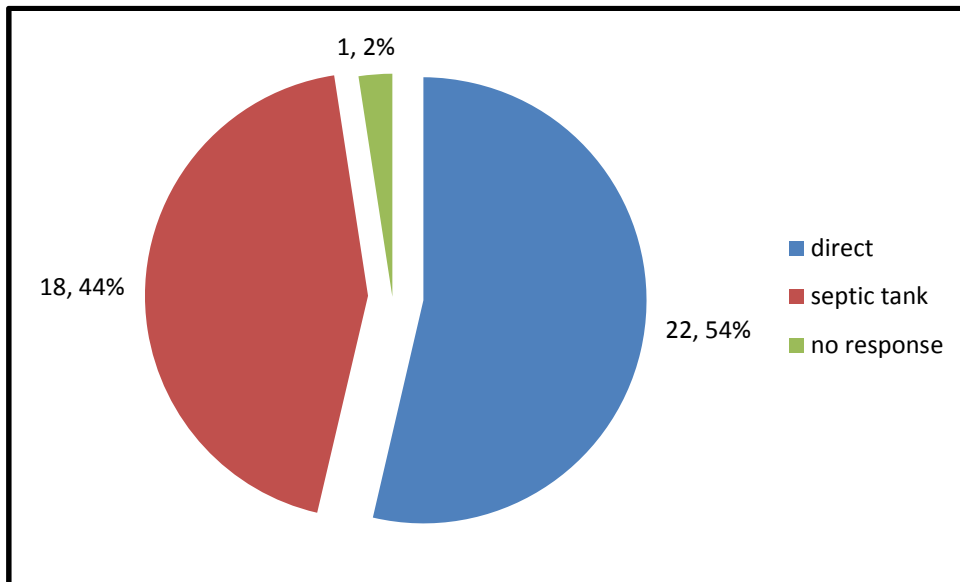


Figure 7: Laboratories connecting directly to the drains or septic tanks

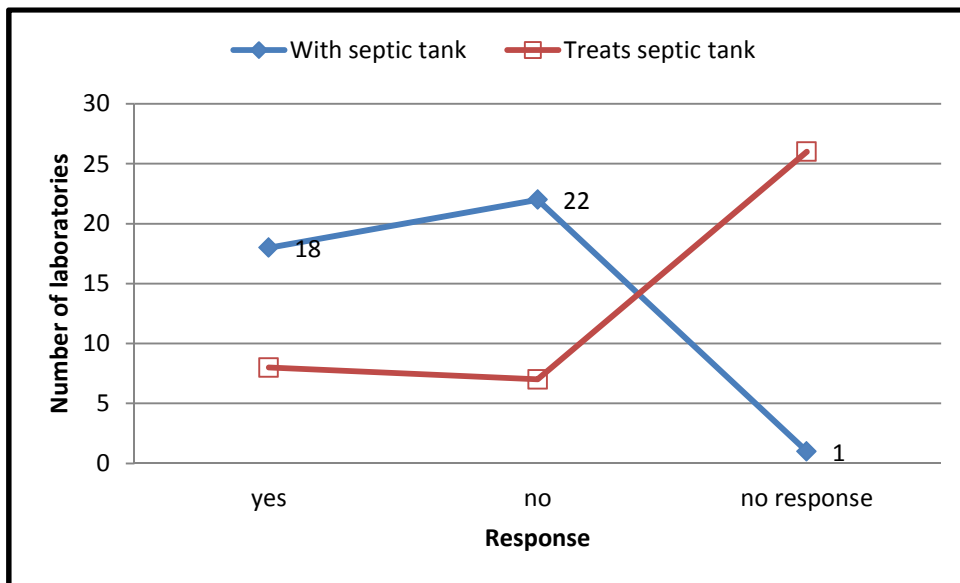


Figure 8: Distribution of laboratories with septic tanks and treats their liquid waste



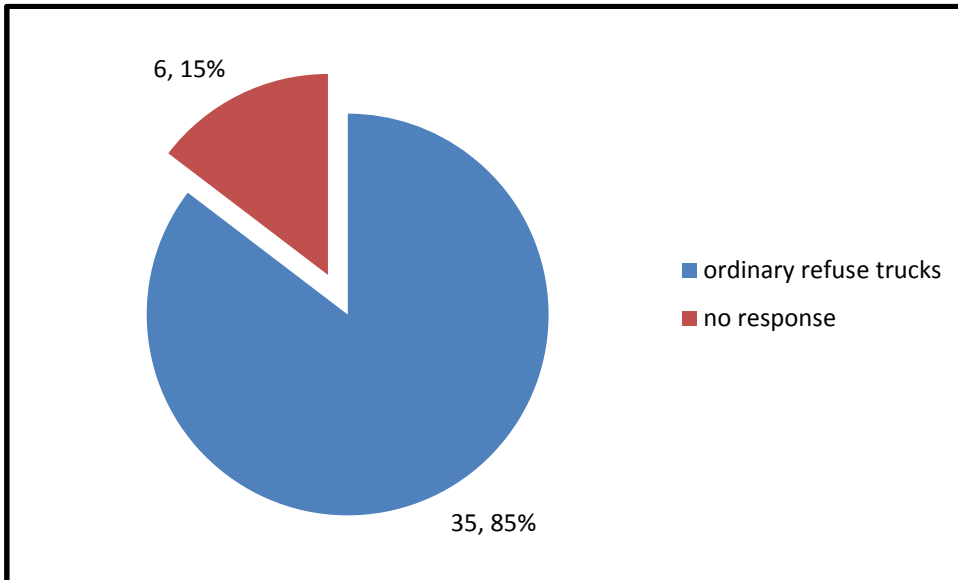


Figure 9: Types of waste trucks

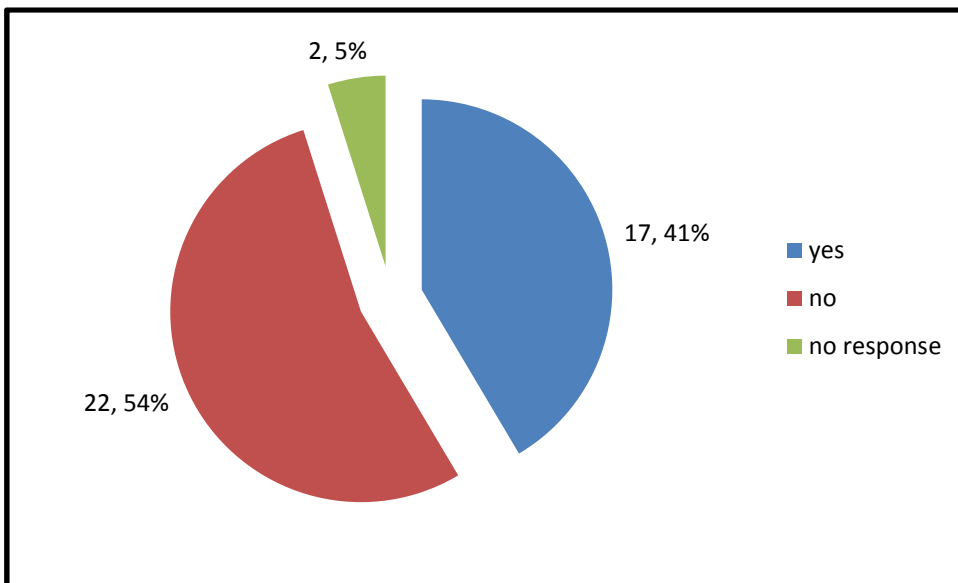


Figure 10: Distribution of laboratories with incinerators