

CASE STUDY EVALUATION OF HEALTH-CARE WASTE CHALLENGES IN HOSPITALS WITHIN ILORIN METROPOLIS

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ABSTRACT

This paper examines health-care waste (HCW) management challenges in hospitals within Ilorin metropolis of Kwara State, Nigeria. The ways by which hospitals in Ilorin, manage their HCW was evaluated using a structured questionnaire which was administered to public and private hospitals within the metropolis. About 177.67kg of wastes was found to be generated daily and the average waste generated per bed per day was 1.56kg. The management of these wastes is often poor, with a mixture of potentially infectious and non-infectious wastes being a common sight in hospital waste bins and hospital environment. The method of waste disposal is by open burning at Ita-Amo or Asa dam dumpsite. This approach is hazardous and constitutes environmental threats, increased vulnerability to potential transmission of communicable diseases and natural disasters. Treatment facility coupled with environmentally friendly recycling and recovery options are the most single effective environmental measure necessary for HCW management.

Keywords: Health-care waste, management, treatment facility, recycling and recovery options, and transmission of communicable diseases

1. INTRODUCTION

Waste has been a result of man's activities from his earliest civilization, made more prominent during the industrial revolution, intensified by technology development of twentieth century and given political and economic exposure by the passage of solid waste act of 1965 [1]. In Nigeria, management of solid waste became a phenomenon in the early 1970s, when the oil boom compounded the rapid industrialization and the urbanization problems.

Waste is defined as unwanted or unusable items, remains, or byproducts, or household garbage [2], or arises mainly as byproducts or unused reactants from the process, or as off-specification product produced through mis-operation [3]. There is a wide variation in volume and diversity of wastes from domestic, commercial, industrial and institutional land use types. In particular, institutional land uses such as hospital, as a result of the demand for health-care activities lead to the production of potentially toxic, infectious and hazardous wastes.

Health-care waste (HCW) results from diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production and/or testing of biological materials [4,5,6].

Most of this waste is not more dangerous than regular household waste. However, some types of HCW represent a higher risk to health. These include infectious waste (15% to 25% of total health-care waste) among which are sharps waste (1%), body part waste (1%), chemical or pharmaceutical waste (3%), and radioactive and cytotoxic waste or broken thermometers (less than 1%) [7]. The issue of sound management of HCW has become one of the most crucial menace confronting hospitals and the society at large. Public concern and awareness on this issue are increasing via the media, conferences, strategic meetings, debates and it is a subject of several studies. Advocates of environmental protection have drawn the attention of the national policy-makers to the health hazards and potential danger to natural resources caused by inadequate management of wastes [8,9,10].

HCW must be properly managed in a way that minimizes risk to human health and reduced negative impact on the environment. Just as a botanist regards a weed as a plant in a wrong place, so also waste is a resource in a wrong place [11]. However, HCW is a resource such that if adequately managed, can serve as manure for farming via composting the “biodegradable” as well as raw materials for some factories and industries through material recovery and recycling (reuse) of the “non-biodegradable”. As primitive as open dump methods of solid wastes (more so, HCW) disposal is, it is observed that it remains the predominant means in developing countries [12]. Rushbrook and Pugh [13] considered the open dump method of solid waste disposal as both “naïve and dangerous” because of the leaching effects of chemicals and biological contaminants in the wastes, which constitutes a direct risk to transmission of communicable diseases. Although, incineration is not a clean process of disposing these wastes, it is still the most effective methods of treatment of HCW because it involves the application of combustion process under controlled condition at elevated temperature, converting wastes containing stocks of infectious agents and pathological materials to inert mineral residues and gases [14,15,16,17]. However, incineration is regarded as the most expensive waste management option because it requires capital intensive plant, highly skilled personnel and careful maintenance [18] and it may lead to the production of dioxins, furans or other toxic pollutants as emissions [7] and residues. Improper HCW disposal method like open air burning, landfilling, dumping into water bodies are in developing countries. This constitutes environmental threats, increased vulnerability for potential transmission of communicable diseases and natural disasters.

This paper examines health-care waste (HCW) management challenges in hospitals within Ilorin metropolis of Kwara State, Nigeria.

2. MATERIALS AND METHOD

The study area is the ancient city of Ilorin, the kwara state capital. Ilorin metropolis is about 500km from Abuja, the federal capital and it lies on latitude 08°29' and longitude 04°37' at an elevation of 307m above sea level. Eight (8) hospitals comprising two (2) public (government owned) and six (6) private hospitals were used in this study. The tool used for data collection is a structured questionnaire administered to each hospital, completed by senior and junior cadres of staff. The data required ranges from types of services rendered, composition and quantity of waste generated, mode and frequency of collection, storage and handling, segregation, material recovery and recycling option, composting, transportation means and frequency of disposal, treatment and disposal methods. Personal interview with staff and patients was also used to get specific information.

3. RESULTS AND DISCUSSION

The tables below present the collected data and the analyses of the results obtained. The composition of HCWs generated from the sampled facilities is similar but the quantity differs. The components of the wastes were sharps, swabs, chemical or pharmaceutical wastes, laboratory wastes, cultures and stock of infectious wastes and general trash.

Table 1: Handling of HCWs in Hospitals in Ilorin Metropolis, Nigeria

Hospitals	Average No. of Patients/day	No. of Waste Units in use	Estimated Daily Waste Generated(m ³)	Frequency of Collection	Frequency of Disposal
A	25	2	27.5	Daily	Once/week
B	30	2	36.6	Daily	Twice/week
C	35	4	41.3	Daily	Twice/week
D	35	4	43.1	Daily	Thrice/week
E	50	5	64.5	Daily	≥Thrice/week
F	75	8	100.5	Twice/daily	Twice/week
G	250	7	377.5	≥ Thrice/daily	Daily
H	440	12	730.4	≥ Thrice/daily	Daily

Where A, B, C, D, E and F represent the sampled private hospitals and G and H represent the sampled public (govt. owed) hospitals

The HCWs generated from different departments in the sampled hospitals are not segregated except major pathological wastes (from theaters) which are separated for special handling. Thus, no segregation or treatment is made before disposing infectious, non-infectious, biodegradable and non-biodegradable wastes. As primitive as open dump and land fill methods of HCWs disposal are, three of the sampled hospitals in Ilorin dispose HCWs by open dumping while one dispose by land filling as shown in Table 3.

Improper management of HCW causes the transmission of communicable diseases in the environment [16,19]. None of the sampled hospitals treat its wastes while six hospitals (Table 4) use either private or government agency for wastes disposal at Ita-Amo or Asa Dam dumpsite. Thus, there is need for public enlightenments on handling and disposal of HCWs. This also suggests that further work should be undertaken in material/energy recovery from HCW.

Table 2: Mode of Storage of HCW in Hospitals within Ilorin, Nigeria

Mode of Storage	No. of the Sampled Hospitals adopting the Methods
Bulk bin	5
Drums	8
Plastic containers	4
Plastic bags	2

Table 3: Method of Collecting HCW and Responsible Agency in Ilorin, Nigeria

Collection Methods	No. of Sampled Hospitals adopting the Methods
Land filling	1
Open dumping	3
By Kwara Waste Mgt Agency (KWMA)	3
Not specified	1

Table 4: HCW Disposal Method in Hospitals within Ilorin Metropolis, Nigeria

HCW Management Methods	No. and % of Hospitals adopting the Methods
Open air burning	6
Not specified	2

4. CONCLUSIONS

Indiscriminate dumping of HCWs being generated in Ilorin are abounds and these can lead to outbreak of communicable diseases in the environment. These wastes need environmentally sound management (treatment) methods. Thus, it is recommended that

1. HCW should be separated from domestic wastes to enhance treatment and disposal;
2. Waste generators must be educated to properly manage waste from point of generation so that staff, patients, and the environment are protected against diseases;
3. The public should be enlightened on the danger associated with HCWs;
4. Regular training workshop for HCW management personnel on management of HCWs and danger inherent; and
5. The sanitation agencies should oblige the hospitals to comply with the guidelines for management of HCWs.

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