A STUDY ON BIO MEDICAL WASTE DISPOSAL IN MEDICARE ENVIRO SYSTEMS IN THANJAVUR

D. Mehala[1], S. Venkatesh[2]
[1]Final year MBA, School of Business, PRIST University, Vallam, Thanjavur.
[2]Associate Professor, School of Business, PRIST University, Vallam, Thanjavur.

ABSTRACT

Serious questions are being raised about economic and environmental consequences of Bio-medical waste (BMW) in developing countries in recent times. BMW although constitutes a small portion of the total municipal waste generated, needs special handling treatment and disposal as it is highly toxic and infectious, and can pose a serious threat to human health if not managed in a scientific manner. In fact, the problem of BMW is more a question of its acute hazardous nature rather than the quantity generated. With this backdrop, the present study looks into the existing trends of BMW management in thanjavur city, Tamil Nadu. With the expansion of tourism in tandem with IT/BT boom, thanjavur city administration is struggling to provide improved infrastructure while trying to cope with its massive unplanned development. One such supportive infrastructure that needs a thorough streamlining is the management of BMW, an offshoot of the unprecedented increase in the number of medical institutions. Although several initiatives have been undertaken to manage hospital waste in the city, there still exist missing links that have serious implications for human health and ecology of Thanjavur. In this context, it is imperative to understand the current status of green initiatives in addition to finding ways and means for their further promotion. The goal of this new approach to ecological study is an interdisciplinary understanding of the relationships between cities and natural ecosystems.

1. INTROCDUCTION

Almost all the countries around the world are directing their efforts towards proper disposal of BMW. The management of BMW, due to the increasing use of disposable items, has become one of the major problems faced by the developed countries. On the other hand developing countries are confronted with the problem of categorizing and disposing of medical waste in the sanitary arena. In the United States, hospitals discard more than two million tons of waste annually making it the third largest source of medical waste in the world. In the developing countries, BMW gets dumped in open spaces where rag pickers and beggars while searching for salvageable scrap come in contact with toxic waste and stand the risk contacting hazardous diseases. In sub-Saharan Africa, due of the presence of a large number of incinerators and burnt-out waste, people face innumerable health problems from air and water pollution. Many hospitals in the developed countries are shipping scraps and medical waste to the developing countries to get rid of the menace; for instance, at least 50% of the US hospitals send their single-use items to re-processors who in turn resell them at relatively low prices to third world customers after sterilizing them. In the developing world, the problems associated with medical waste are linked to the lack of funding and national regulations for the disposal of sanitary waste. A UNDP survey says that most of the African countries lack proper sanitary landfills and official policies for medical waste management. For example, Eritrea, Lesotho, and Ghana have no legislations for health care waste management, while Kenya, Nigeria, and Gambia have some significant laws passed in this respect. The lack of sanitary landfills in Gambia, Ghana,

Lesotho, Nigeria, Senegal and Tanzania has led to the use of incinerators to a large extent, while, unscientific dumpsites are found in Kenya and Zambia. It is reported that more than 1000 incinerators are to be found in Africa most of which are not operating, or are under- operating. The disposal of infectious sharps (needles, scalpel blades, blood vials, glassware, etc) is one of the challenging tasks faced by African healthcare facilities. The high cost of the safety boxes used for the disposal of sharps is a serious factor that discourages the use of these boxes. A study by the UNDP shows that most the countries have not disposed of the sharp waste at the dump sites and that a very few hospitals have separate pits for the disposal of sharp waste. Additional funding would definitely help the developing countries for better disposal of medical waste, and it is also necessary to have appropriate legislations for the proper disposal of hospital waste. Efforts are made globally by many NGOs in association with the government and hospitals to address waste management issues by helping the hospitals to recycle the waste besides providing the needed equipment. For instance, Intervol, a New York-based NGO, collects used and unused (but functioning) medical equipment and also distributes them locally, nationally and internationally. This avoids the incineration of these equipments. Another NGO, Medshare, has been collecting medical goods and equipments and transporting to 80 countries for distribution. This in-turn saved more than 1 million cubic feet area of landfills (Source: http://www.globalization101.org/news1/MedicalWaste).

Table 1: States with highest number of violators

States	Number of facilities violating BMW rules
Maharashtra	4,667
Kerala	1,547
Bihar	1,221
West Bengal	632
Uttar Pradesh	532
Tamil Nadu	507
All India	13,037

2. COMPANY PROFILE

1.Name: Medicare Enviro Systems
2.Activites: common bio medical waste treatment and disposal facility
3.Factory : Survey no.208 & 209
Ayothipatti Road
Sengipatti Village
Thanjavur Taluk & District
4.office: No.MIG.270
New housing unit
Pudukottai road
thanjavur.
Phone no:04362 228122
5.contact person: R.santharam
mobile no:9842474846
6.partners details:
a) Mr. R.santharam
b) Mr. R.karthianathan
c) Mr. vishnuraman

M/S.MEDICARE ENVIRO SYSTEMS is a company provides a common facility as per the guidelines of CPCB norms to dispose the Bio-Medical Waste generated by the health care establishment such as hospitals ,clinics, labs etc., Facility has obtained consent under Water and Air act & authorization under Bio-medical waste (M&H) rule from TNPC Board . The facility commenced on 10 th September 2004. we cover the Following Districts.

Thanjavur, Trichy, Tiruvarur, Nagapattinam, Pudukottai, Ariyalur, Perambalur and Sivagangai Districts

MOU 11.10.2001 WITH IMA & NHB
PCB AUTHORISATION 6.6.2003
FUNCTIONING 10.9.2004

LOCATION

located at sengipatti village 22 km from thanjavur. Accepted by TNPCB
we have a site area 5.5 acrs.
high wall fencing and guarded gates is provided at the facility to prevent unauthorized access to the site by humans and livestock.

MAJOR INFRASTRUCURE AT THE FACILITY

(A) BUILDIGS

3. REVIEW OF LITERATURE

Biomedical waste is any waste in the form of solid or liquid, including its containers and any product, which are generated during the treatment, diagnosis and immunization of human beings and animals in research. Basically health care wastes refer to all wastes produced which are discarded and not intended for any further use in hospitals **(BAN & HCWH, 1999).**

Many synonyms to medical waste exist and they are currently used interchangeably in different

parts of the world and in different scientific journals. According to **Moritz (1995)** some of the easily come across synonyms are clinical waste, hospital waste and bio-medical waste. The WHO uses the term "healthcare waste" in reports and other official publications.

Al-Mutair et al., (2004) defined medical waste as any solid or liquid waste capable of causing infectious diseases generated as a result of patient diagnosis, treatment or in related research through the immunization of humans and animals.

Phillips (1999) defined clinical waste as: - waste arising from the investigation, treatment or in medical care of patients. According to **Pruss et al. (1999)** Health care waste is defined as the total waste generated in health care facilities and in addition to hospitals and clinics includes waste generated by blood banks, research facilities and laboratories irrespective of the volumes, characteristics and composition.

Abor and Bouwer (2008) focus their definition to include all types of wastes produced by health facilities such as general hospitals, medical centers and dispensaries.

WHO (2005) considered the BMW is a byproduct of hospitals that includes sharps, non-sharps, body parts, blood, chemicals, medical devices, radioactive materials and pharmaceutical products.

Medical wastes constitute a larger part of hazardous wastes **(Chul Jang et al., 2006).** The generation of these wastes is an ongoing phenomenon as long as human civilization persists. Hospital waste is sub-divided into health care general waste (HCGW) and health care risk waste (HCRW).

The health system is under pressure to dispose of health care waste in such a way as to avoid unnecessarily high levels of environmental degradation. The aim of health care facilities worldwide is beginning to subscribe to the social goals of a cleaner and safer environment. To manage health care waste optimally, health care providers should consider all stages or whole life cycle of the medical product by looking at the medical product's upstream and down-stream activities **(Kaiser et al. 2001).**

4. RESEARCH INSTRUMENTS

A **questionnaire** is a research instrument consisting of a series of questions (or other types of prompts) for the purpose of gathering information from respondents. The questionnaire was invented by the Statistical Society of London in 1838. Although questionnaires are often designed for statistical analysis of the responses, this is not always the case.

Questionnaires have advantages over some other types of surveys in that they are cheap, do not require as much effort from the questioner as verbal or telephone surveys, and often have standardized answers that make it simple to compile data. However, such standardized answers may frustrate users.

4.1. CONCEPTUALIZATION

Open dumping

Open dumps refer to uncovered areas that are used to dump solid waste of all kinds. The waste is untreated, uncovered, and not segregated. It is the breeding ground for flies, rats, and other insects that spread disease. The rainwater run-off from these dumps contaminates nearby land and water thereby spreading disease. In Bilaspur City, open dumps are being phased out.

Landfills

Landfills are generally located in urban areas where a large amount of waste is generated and has to be dumped in a common place. Unlike an open dump, it is a pit that is dug in the ground. The garbage is dumped and the pit is covered thus preventing the breeding of flies and rats. At the end of each day, a layer of soil is scattered on top of it and some mechanism, usually earth-moving equipment is used to compress the garbage, which now forms a cell. Thus, every day, garbage is dumped and becomes a cell. After the landfill is full, the area is covered with a thick layer of mud and the site can thereafter be developed as a parking lot or a park. Landfills have many problems. All types of waste are dumped in landfills and when water seeps through them it gets contaminated and in turn pollutes the surrounding area. This contamination of groundwater and soil through landfills is known as leaching.

Sanitary landfills

An alternative to landfills which will solve the problem of leaching to some extent is a sanitary landfill which is more hygienic and built in a methodical manner. These are lined with materials that are impermeable such as plastics and clay, and are also built over impermeable soil. Constructing sanitary landfills is very costly

and they are having their own problems. Some authorities claim that often the plastic liner develops cracks as it reacts with various chemical solvents present in the waste. The rate of decomposition in sanitary landfills is also extremely variable. This can be due to the fact that less oxygen is available as the garbage is compressed very tightly. It has also been observed that some biodegradable materials do not decompose in a landfill. Another major problem is the development of methane gas, which occurs when little oxygen is present, i.e. during anaerobic decomposition. In some countries, the methane being produced from sanitary landfills is tapped and sold as fuel.

Sharps. This kind of waste includes anything that can pierce the skin, including needles, scalpels, lancets, broken glass, razors, ampules, staples, wires, and trocars.

Infectious Waste. Anything infectious or potentially infectious goes in this category, including swabs, tissues, excreta, equipment, and lab cultures.

Radioactive. This kind of waste generally means unused radiotherapy liquid or lab research liquid. It can also consist of any glassware or other supplies contaminated with this liquid.

Pathological. Human fluids, tissue, blood, body parts, bodily fluids, and contaminated animal carcasses come under this waste category.

Pharmaceuticals. This grouping includes all unused, expired, and/or contaminated vaccines and drugs. It also encompasses antibiotics, injectables, and pills.

Chemical. These are disinfectants, solvents used for laboratory purposes, batteries, and heavy metals from medical equipment such as mercury from broken thermometers.

Genotoxic Waste. This is a highly hazardous form of medical waste that's either carcinogenic, teratogenic, or mutagenic. It can include cytotoxic drugs intended for use in cancer treatment.

General Non-Regulated Medical Waste. Also called non-hazardous waste, this type doesn't pose any particular chemical, biological, physical, or radioactive danger.

4.2. PROFILE OF RESPONDENTS

In social sciences research personnel characteristics of respondents have very significant role to play in expressing and giving the responses about the problem, keeping this in mind, in this study a set of personal characteristics namely, age, sex, occupation, income etc of the 264 respondents have been examined and presented in this chapter

The survey was conducted among staffs in hospitals

The total population is customers and the sample population of my study is **100** customers

I took **10%** of the customers from the total population

4.3. HYPOTHESIS

"It is a tentative prediction about the nature of the relationship between two or more variables. It implies that there is a systematic relationship between an independent and dependent variable"

"A hypothesis can be defined as a tentative explanation of the research problem, a possible outcome of the research, or an educated guess about the research outcome."

Keeping in view of objectives of the study, the researcher is frame suitable null hypothesis and tested appropriated.

5. DATA ANALYSIS

TABLE 5.1 Distribution of respondents is based on age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-30	29	19.3	19.3	19.3
	31-40	61	40.7	40.7	60.0
	41-50	60	40.0	40.0	100.0
	Total	150	100.0	100.0	

INTERPRETATION

In the above table 29% respondents belongs to 21 – 30 years of age, 61% respondents belongs to 31 – 40 years of age, 60% of the respondents belongs to 41 – 50 years of age. According to the survey most the respondents belongs to 31 – 40 years of age

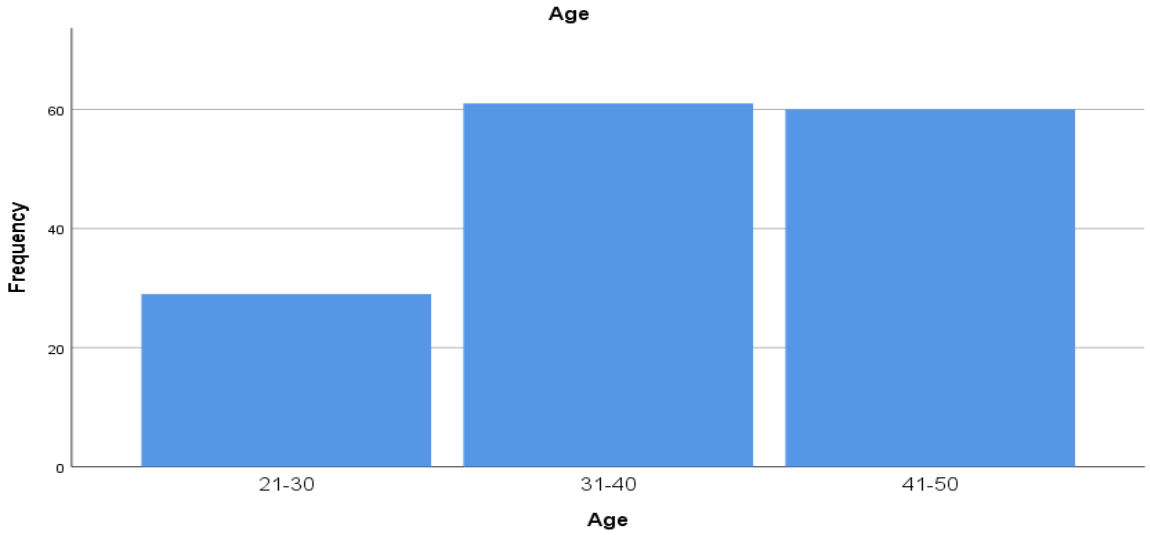


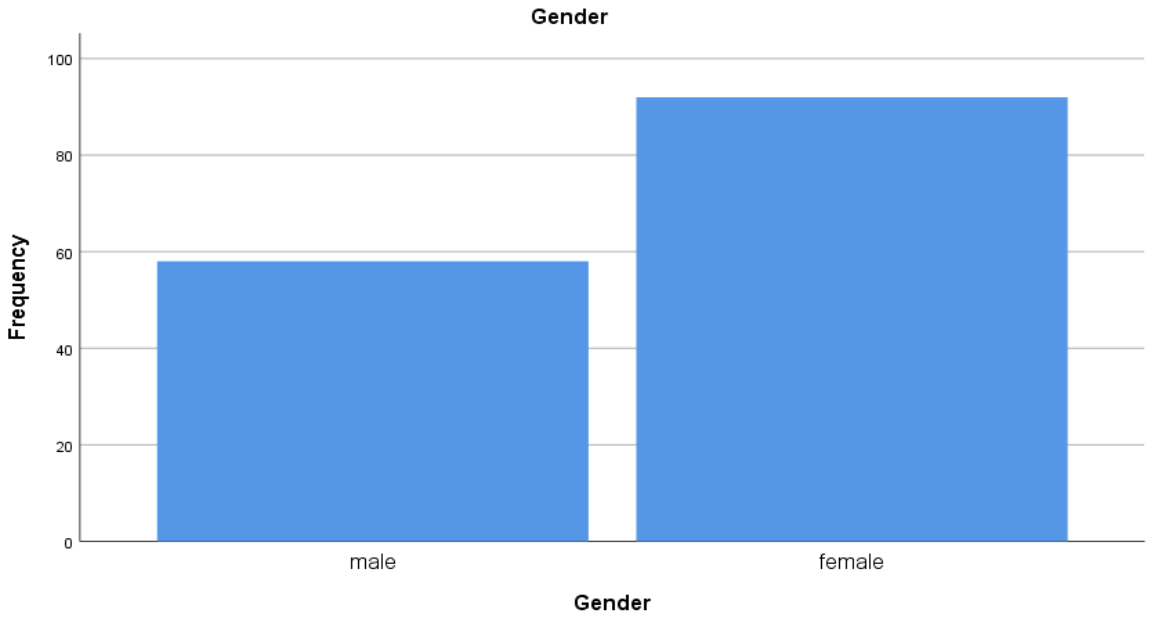
TABLE 5.2 Distribution of respondents based on gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	58	38.7	38.7	38.7
	Female	92	61.3	61.3	100.0
	Total	150	100.0	100.0	

INTERPRETATION

In the above table 39% respondents are male, 61% respondents are female . According to the survey most the respondents are female.



6. CONCLUSION

Medical wastes should be classified according to their source, typology and risk factors associated with their handling, storage and ultimate disposal. The segregation of waste at source is the key step and reduction, reuse and recycling should be considered in proper perspectives. We need to consider innovative and radical measures to clean up the distressing picture of lack of civic concern on the part of hospitals and slackness in government implementation of bare minimum of rules, as waste generation particularly biomedical waste imposes increasing direct and indirect costs on society. The challenge before us, therefore, is to scientifically manage growing quantities of biomedical waste that go beyond past practices. If we want to protect our environment and health of community we must sensitize our selves to this important issue not only in the interest of health managers but also in the interest of community. It can be concluded that the hospital had an efficient and a well-organized BMW management system in place that was even conforming to the latest BMW Management Rules 2016 to some extent. Moreover, the hospital could upgrade the techniques of BMW management as per the latest guidelines. As far as the categorization of BMW is concerned, it has to be changed accordingly. Needless to say, a regular training and monitoring of BMW management at all hospitals is the need of the hour and has a long way to go for environmental and human health.

REFERENCES

- Status of Biomedical Waste Management in National Capital Territory of Delhi Available at: http://www.medwasteind.org/pdf/. Accessed on 15 May 2016
- World Health Organization, Health care waste management, Fact Sheet No. 281, August (2004). Available at: http://www.who.int/water_sanitation _health/publications/wsh04081annexes. pdf. Accessed on 15 May 2016.
- Patwary MA, O‟Hare WT, Sarker MH. Assessment of occupational and environmental safety associated with medical waste disposal in developing countries: a qualitative approach. Safety Sci. 2011;49(8-9):1200-7.
- Biomedical Waste Management. Indian Society of Hospital Waste Management. Available at: http://medwasteind.org/random.asp. Accessed on 15 September 2016.
- Kumari R, Srivastava K, Wakhlu A, Singh A. Establishing biomedical waste management system in Medical University of India: A successful practical approach. Clin Epidemiol Global Health. 2013;1(3):131-6
- Kishore J, Goel P, Sagar B, Joshi TK. Awareness about biomedical waste management and infection control among dentists of a teaching hospital in New Delhi. Indian J Dental Res. 2000;11:157-61.