

## Bio Medical Waste A Corporate Responsibility Dilemma in INDIA

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### **Abstract**

Medical care is vital for our life, health and well being and there has been phenomenal increase in the healthcare facilities (for humans and animals) in India .Currently the country can boast of 13550 Hospitals; 27400 dispensaries; 717860 Registered Medical practitioners; 295000 nurses; 227000 Auxiliary nurses & Midwives .It is estimated that Indian health care industry is growing at a rate of 12% per annum. But the waste generated from medical activities can be hazardous, toxic and even lethal because of their high potential for diseases transmission. The hazardous and toxic parts of waste from health care establishments comprising infectious, bio-medical and radio-active material as well as sharps (hypodermic needles, knives, scalpels etc) constitute a grave risk, if these are not properly treated / disposed or are allowed to get mixed with other municipal waste. This paper recognizes the mounting problems faced by the society due to exposure to untreated disposal of Biomedical wastes from a large number of health centers .The guidelines for their orderly disposal as provided in the legal framework is overlooked .An awareness campaign to educate the layman about the harmful effects of these wastes is yet to evolve. This paper looks into the current status of disposal of biomedical waste in the city of Mumbai and aims to recommend some viable strategies for managing this problem.

**Key Words** – Corporate Responsibility, Biomedical Waste, Health Care, Business Ethics.

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## **Introduction -**

Bio-medical waste means any solid and/or liquid waste including its container and any intermediate product, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research pertaining thereto or in the production or testing thereof. There has been phenomenal increase in the healthcare facilities (for humans and animals) in India .Currently the country can boast of 13550 Hospitals ; 27400 dispensaries;717860 Registered Medical practitioners ; 295000 nurses; 227000 Auxiliary nurses & Midwives . Today a new category of profit oriented hospitals have come up with focus only on investor benefits.It is estimated that Indian health care industry is growing at a rate of 12% per annum and Studies have shown that about three fourth of the total waste generated in health care establishments is non-hazardous and non-toxic. Some estimates put the infectious waste at 15% and other hazardous waste at 5%. India generates more than 3 lakh tones of medical waste annually.All over the country, unsegregated and untreated biomedical waste is being indiscriminately discarded into municipal bins, dumps sites, on roadsides, in water bodies or is being incompletely and improperly burnt in the open. All this is leading to rapid proliferation and spreading of infectious, dangerous and fatal communicable diseases like hepatitis, AIDS and several types of cancers. In urban and rural areas alike, incidence and prevalence of several such human diseases has increased and the per capita medical expenditure has also gone high several folds. Although, yet to be proven, morbidity or illness amongst both urban and rural dwellers has increased albeit for different reasons. The Ministry of Environment and Forests, Govt. of India has notified the Biomedical Waste (Management and Handling) rules 1998 with subsequent amendments (2<sup>nd</sup> June 2000 and September 2003). However, only 5-10% of institutions in the country have implemented the Rules or are following them at present. Unfortunately, some western countries, in the garb of managing their biomedical wastes, are adding to our problems by exporting their wastes to poorer countries.

## Literature Review

**Sudeshna Chatterjee and Jyoti Shelar<sup>1</sup> (2012)** reported that 80% of Mumbai hospitals flout bio-waste disposal norms and hazardous waste which is very dangerous and which needs to be incinerated at 900 degrees Celsius and is not segregated at source, moreover the disposal agency official have also reported that they hardly receive used syringes and saline bottles which further raises fears that this bio-waste is recycled in the market.

Director of SMS Envoclean, **Chetan Bora<sup>2</sup> (2012)** has mentioned that eighty percent of government and private hospitals do not segregate medical waste at source, thus to raise awareness, SMS Envoclean regularly send posters on the right disposal method to all healthcare units and the bio-degradable bags which SMS Envoclean sells also carry information about how used medical items can be separated, but all these efforts have proved to be futile.

**Veda Hegde, RD Kulkarni and GS Ajantha<sup>3</sup> (2007)** are of the opinion that proper handling, treatment and disposal of biomedical wastes are important elements of health care office infection control programme and correct procedure will help protect health care workers, patients and the local community.

Regional Officer at Maharashtra pollution control board **Dr Jitendra Sangewar<sup>4</sup> (2012)** reported that Maharashtra pollution control board is considering steps to ensure that hospitals are encouraged to maintain hygiene during waste disposal and this includes making the hospital sign bank guarantee over 1 lakh and if the hospitals fails to meet any of norms, then Maharashtra pollution control board will encash the bank guarantee.

Member Secretary West Bengal Pollution Control Board **Sandipan Mukherjee<sup>5</sup> (2010)** has mentioned in the report that total biomedical waste generated in the state of West Bengal is around 12000 MT per year and with a rate of increase of 1% per year, the annual generation of biomedical waste in the state has been estimated to be nearly 13500 MT in the year 2020. At present 5 large and 2 small Common biomedical waste Treatment Facilities and 14 Stand-Alone Treatment Facilities are functioning in the state, but as a whole only 28% of biomedical waste is being treated as most of the health care units are yet to be incorporated in the management regime.

**The research design and methodology is presented under the following heads.**

**Area of Study**

This research is limited to Mumbai City.

**Nature and Source of Data**

The proposed study is based on both primary and secondary data. A systematic analysis of the operational aspects of a leading incinerator unit located at Deonar, a suburb of Mumbai City, has been done to expose the gravity of the situation.

**Tools Used**

SPSS 17.

Structured questionnaire along with interviews was used for eliciting the views on Biomedical waste. The questionnaire contained questions on influencing factor and other related aspects.

**Data Analysis-**

Data collected is analyzed with the help of Chi-square test.

**Hypothesis Statement**

$H_0$ : There is no social awareness about the dangerous consequences of improper treatment of medical waste.

$H_1$ : There is social awareness about the dangerous consequences of improper treatment of medical waste.

## **The Problem**

The growth as aforesaid is accompanied by a lot of wastes being generated in the course of their operations which is a heterogeneous mixture, which is very difficult to manage as such. These wastes are toxic and infectious and there is ample evidence to suggest that unplanned disposal of bio medical wastes are likely to generate social concerns of various sorts, i.e.

1. Threat to life
2. Environmental pollution
3. Genetic disorder
4. Occupational Hazards
5. Threat to Animal Life

Untreated and non segregated biomedical wastes are being indiscriminately discarded into Municipal bins, dump sites, on road sides, in water bodies or improperly burned in the open. All these are leading to rapid proliferation and spreading of infectious, dangerous and fatal communicable diseases such as Hepatitis, AIDS, Cancer etc. As a result the per capita medical expenses by average Indian has gone up to disturbing level. The indiscriminate disposal of sharps within and outside institution leads to hazards like Needle stitch injuries, cuts and infections among hospital employees, Municipal workers and rag pickers, this in turn can increase the incidence of Hepatitis, HIV and other dreadful diseases. Some of the affected may succumb to such fatal diseases. It is estimated that in every four kilogram of waste generated in any hospital at least one kilogram will be infectious.

## **Components of Bio-medical waste**

1. Human anatomical waste (tissues, organs, body parts etc.),
2. Animal waste (as above, generated during research/experimentation, from veterinary hospitals etc.),
3. Microbiology and biotechnology waste, such as, laboratory cultures, micro-organisms, human and animal cell cultures, toxins etc.,
4. Waste sharps, such as, hypodermic needles, syringes, scalpels, broken glass etc.,
5. Discarded medicines and cyto-toxic drugs
6. Soiled waste, such as dressing, bandages, plaster casts, material contaminated with blood etc.,
7. Solid waste (disposable items like tubes, catheters etc. excluding sharps),
8. Liquid waste generated from any of the infected areas,
9. Incineration ash,
10. Chemical waste.

## Analysis and Interpretation -

**Table 1: The sources from where wastes is generated**

| Sr No. | Source                            |
|--------|-----------------------------------|
| 1      | Amputated Organs                  |
| 2      | Anatomical wastes                 |
| 3      | Bandage and Syringes              |
| 4      | Body fluid Chemical wastes        |
| 5      | Wastes from Maternity Hospitals   |
| 6      | Discarded Medicines               |
| 7      | Disposable                        |
| 8      | Human Excreta                     |
| 9      | Micro organisms in the blood      |
| 10     | Unplanned Disposal                |
| 11     | Soiled waste                      |
| 12     | Waste animal carcass              |
| 13     | Wastes from biological laboratory |

**Source: Compiled from the questionnaire**

**Table no 2.** Awareness about the dangerous consequences of improper treatment of medical waste?

|              | Observed N | Expected N | Residual |
|--------------|------------|------------|----------|
| Yes          | 145        | 150.0      | -5.0     |
| No           | 155        | 150.0      | 5.0      |
| <b>Total</b> | 300        |            |          |

### Test Statistics

|             | Awareness about the dangerous consequences of improper treatment of medical waste |
|-------------|---|
| Chi-Square  | .333  |
| df          | 1   |
| Asymp. Sig. | .564  |

**Source: Compiled from the questionnaire**

**Inference:** Table no 2 shows that out of 300 respondents surveyed in Mumbai, 48.33% i.e. 145 people are aware about the dangerous consequences of improper treatment of medical waste and 51.67% i.e. 155 people are not aware about the dangerous consequences of improper treatment of medical waste.

Since the calculated value is .333 which is less than the table value i.e. 5.991, Thus **H<sub>0</sub> is accepted**. Hence we conclude that People are not aware about the dangerous consequences of improper treatment of medical waste.

### **Case study of Bio-medical waste treatment plant of BMC located at Deonar -**

This case study relates to a Bio-medical waste treatment plant of BMC located at Deonar. The disposal facility is spread over 4,000 sq meter of land and handles 10 tones of medical waste which comes from 1270 number of hospital .At the heart of the plant are 2 incinerator having a capacity of 250kg each, which burns hazardous materials from hospitals at a temperature of 850 to-1050 deg c and the gases produced could end up in the hospitalization of a large number of people within a radius of one kilometer. The incineration plant made no efforts to monitor the level of pollutants released into the air, opined Dr, Sandip Rane, appointed by High court to look into the magnitude of air pollution in and around the plant. The number of biomedical waste incineration plants in Maharashtra is 30 and a new plant to be set up in Malad, for waste generated from hospitals from western suburbs has been proposed.

### **Problems of unplanned burning**

- Dioxins are produced during combustion process studies have established that they can cause reproductive and development problems and an increased risk of heart disease and diabetes.
- The Doctor stated that the incineration plant at Deonar made no efforts to monitor the level of pollutants released in the air, this was against the guidelines of Central pollution control board which require every incineration plant to have its own on-site air quality monitoring unit.

## **Legal framework**

The Ministry of Environment and Forest (MOEF) has issued a notification directing the compliance of the following conditions for the disposal of Bio medical wastes. These rules cover Hospitals, Nursing home, clinic, Dispensary Veterinary institution, Animal House, Pathological laboratory and Blood bank.

1. The rules stipulate segregation of wastes at the point of generation as per Schedule 2 contained in the rules.
2. The Rules also stipulate that untreated biomedical wastes shall be transported only in such vehicle as may be authorized for this purpose by the competent authority as specified by the government.
3. It is also incumbent on the operator to ensure that no untreated bio medical waste shall be kept stored beyond 48 hours

## **Compliance Record**

The status of compliance of regulations regarding disposal of medical wastes reveal a dismal situation According to the ministry of environment and forest only 5-10 %of institutions in this country have implemented the rules.

## **Beneficial impacts overlooked**

Segregating toxic and infectious materials have favorable impact on hospital maintenance, patients and the community as a whole, the important among them is:

- It reduces treatment cost.
- Reduces the impact of waste on community.
- Reduces the chances of infecting the health workers.

## **Findings**

1. Staff at some hospitals stuff hazardous waste in regular trash bags and not colour coded ones.
2. There is urgent need for new plants to be set up, for waste generated from hospitals in western suburbs.
3. The civic body is keen to explore the potential of a globally used technique called as plasma pyrolysis or gasification, where medical waste is treated at intense temperature of 1200c to curb pollutant discharge.

**Conclusion:** A major strategic failure at the national level is that there were no concerted efforts made to enlighten the community against the hidden dangers of treating the bio medicals in a planned manner

## **Suggestions**

1. Regulations regarding Disposal of Medical Wastes needs to be implemented without fail.
2. Ministry of Health, Government of India, Should initiate an awareness programme for public benefit, with possible inclusion of committed NGOs.
3. Indian Medical Association should organize training programmes in the area of orderly disposal of bio medical wastes for the benefit of medical and paramedical staff.
4. Proper training of health care establishment personnel at all levels coupled with sustained motivation can improve the situation considerably.
5. Municipal Corporation needs to switch to an environment sound technology to treat bio medical waste, with the Change in pollution control norms
6. A new plant to be set up in Malad for waste generated from hospitals from western suburbs has been proposed by BMC, but there is a need for many more such plants.
7. Medical waste shall not be considered properly treated unless the Time, temperature and pressure indicators indicate that the required time, temperature and pressure were reached during autoclave process.
8. Each autoclave to have graphic or computer recording devises which will automatically and continuously monitor and record dates, loads identification number, and operating parameters throughout the entire length of the autoclave cycle.
9. Standards for deep burial should be complied with, to ensure that it does not contaminate surface or ground water.

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