An investigation into the handling of hospital waste in South India. The Monsoon – Earth's Biggest Waste Management Company

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Summary: The intention of this paper is to give you a view of waste management in Kerala and Tamil Nadu. The practical part of this work in India in January 2003 and November 2003 primarily is concerned with the handling of infectious waste in hospitals. The danger of infectious waste has been ignored or neglected for a long time in India. It was only in 1998 that the Indian health minister introduced the Biomedical Waste (Management and Handling) Rules which marked a milestone. This document wants to point out if these new instructions and rules have changed something for the better in hospitals instructions and also in environment protection. Summing up it can be said that the introduction of the Biomedical Waste ("Management and Handling") Rules has increased the costs for hospital management to almost ruinous levels. These additional expenses particularly affect small, privately-run, rural hospitals which assure medical care even in remote areas. The hygienic risk potentials are only theoretically tackled with regard to hospital waste - and then only with unwanted financial side effects for hospitals.

Key Words: Waste ("Management and Handling") Rules, hospital waste India

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For a long time the risk potential of infectious waste was neither recognised nor considered. It was not until 1998 that the Indian Health Minister took the first step towards such recognition by introducing Biomedical Waste ("Management and Handling") Rules. The method of implementation of these new guidelines were investigated by the author in a field study. The aim was to give an overview of the waste situation in Kerala and Tamil Nadu. The focus of the on-site investigation in January and November 2003 was on the handling of infectious waste in hospitals. In an interview with The Hindu on November 25 2002, the ministry responsible claimed that the large number of hospital-acquired infections (seven out of ten patients are infected with a new virus while hospitalised) was one of the main reason for the introduction of these Biomedical Rules.

Negligent handling of hospital waste endangers mainly hospital staff, patients, refuse collection agents and staff working on waste dumps. One can find people making their living from recovering still useable items on almost all bigger city waste sites in India. It is often children who contract lethal infections from illegally disposed waste. The biggest danger is posed by syringes, infusion needles and scalpels.

The Biomedical Waste ("Management and Handling") Rules require the handling of waste in a way that does not pose any danger to man or the environment. Currently, the law demands all hospitals install their own waste furnace. If the rules are not obeyed, hospitals are threatened with closure.

Investigation of M.M.T. Hospital in Mundakayam (Kerala, India)

The M.M.T. Hospital in Mundakayam was founded privately in 1947 by planters to provide health care facilities for their workers (mainly tea pickers). In 1997 the Catholic Church took over the hospital. It is equipped with 180 beds and on average houses 150 inpatients at any given time. About 200 outpatients, who mainly suffer from cuts from the harvest work, are treated every day. The gynaecological ward is the site of approximately 35 births per month, 40% of which are via C-section.

In the summer of 2003 the M.M.T. Hospital, pressured by the new regulations, installed a waste furnace (*Fig.1*). According to the operating manual, the furnace reaches a combustion temperature of 800°C, provided ideal operating conditions, auxiliary diesel burning and correct introduction of waste are attained. Yet due to permanent financial difficulties faced by the hospital, the auxiliary diesel burning is not always operational. Therefore, the temperature necessary for proper combustion is no longer attained. To determine the composition of the waste, three samples were analysed according to type (*Fig. 2, Table 1*).

Fig. 1: *From left: the old waste bunker, the old furnace and the new furnace*
1. ábra: *Balról: a régi hulladék raktár, a régi kemence és az uj kemence*

Fig. 2: *Attempt at sorting of hospital waste*
2. ábra: *Próbálkozás a kórházi hulladék szortirozására*

TABLE I: **Result of the sorting attempt by percentage volume**
I. TÁBLÁZAT: **Osztályozási kisérlet százalékos térfogat elemzés alapján**

	Paper	Plastics	Biogenic	Problematic waste	Remainder	Needles pcs.	Waste volume
January	40	30	20	5	5	n.a.	
Nov. 9:00a.m.	40	30	5	20	5	16	80 litres
Nov. 4:00p.m.	35	30	10	20	5	40	120 litres

According to recent reports from India, the old waste bunker was again put into operation for final disposal because the new furnace had collapsed in 2008. Currently, the hospital pays a waste removal fee per bed, yet waste collection does not occur.

Investigation of St. Mary's General Hospital

Marian Hospital Salem's foundation was laid in 1960 when a leper ward was constructed at the site. Currently, the hospital has 160 beds, in addition to emergency beds and private accommodation, as well as a nursing school on site. The hospital has a staff of about 150 and is managed by nuns. The hospital's main focus, apart from general practice, is on neurology, orthopaedics, paediatrics and – with approximately 15 births per day – gynaecology.

As reported in an interview, the hospital faces serious problems with AIDS and hepatitis patients. These highly contagious viruses do not only pose a great risk to doctors but also to all those who handle infectious waste. This problem is amplified by the fact that for financial reasons, not all patients can be tested for HIV using the trusted Western Blot method. At the Marian Hospital, contaminated materials are usually – that is when collected regularly – disinfected using 1% sodium hypochlorite. Cotton products and bandages which are coated with blood or other bodily fluids are incinerated on the hospital grounds. A device which melts needles at high temperatures is used to destroy most of the injection and infusion needles on site. Visual investigations have, however, proven that intact needles are still to be found in the waste (*Fig. 4*).

Disposal of the Marian Hospital's entire waste is taken care of by a company accredited by the government. Yet collection and thermal elimination (*Fig. 5 and 6*) only occur erratically. In November 2003, this disposal route could no longer be used as the collection company no longer provided these services. This forced the hospital to temporarily store all waste behind the hospital at the edge of a rice field (*Fig. 3 and 4*). Any infectious waste is disinfected before storage using 5% sodium hypochlorite. Fabrics are treated with formalin.

Fig. 3 and 4: *Box for temporary storage of unsorted hospital waste before collection*
3., 4. ábra: *Tartály a nem szortírozott kórházi hulladék időleges tárolására a végleges összegyüjtés előtt*

Fig. 5 and 6: *Waste incineration plant for infectious waste in Salem*
5., 6. ábra: *Hulladék égető telep fertőző hulladékok számára Salemben*

The situation in public hospitals is, according to one doctor in Salem (Tamil Nadu), even worse. Health care provisions are considered an expense by the government. Waste disposal is also left to each individual hospital, which often burn their waste on an open waste disposal site right next to the hospital building. A hospital with 1,500 beds receives 200 injection needles per month from the government. Examining the result of the waste analysis at the M.M.T. Hospital infers an alarming number (*Table II*) for the repeated use of needles in public hospitals.

TABLE II: **Number of times injection needles are used**
II. TÁBLÁZAT: **Hány alkalommal használták az injekciós tűket.**

	Number of injection needles/month	Number of beds	Times each needle is used
M.M.T. Hospital sorting attempt	approx. 760	180	1x
Public hospital	approx. 200	1500	approx. 40x

Summing up it can be said that the introduction of the Biomedical Waste ("Management and Handling") Rules has increased the costs for hospital management to almost ruinous levels. These additional expenses particularly affect small, privately-run, rural hospitals which assure medical care even in remote areas. . The hygienic risk potentials are only theoretically tackled with regard to hospital waste - and then only with unwanted financial side effects for hospitals.

The monsoon remains India's biggest waste management company (*Fig. 7 and 8*)

Fig. 7 and 8: *Waste prepared to be removed by the Monsoon*
7., 8. ábra. *A monszunnal való eltávolításra előkészített hulladék*

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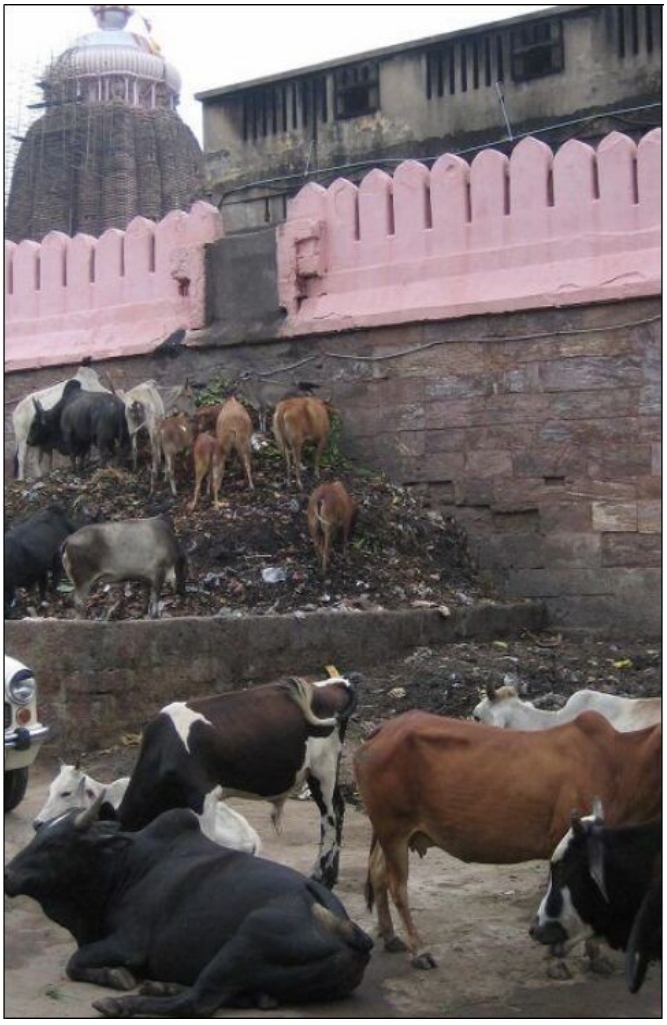
A dél-indiai kórházi hulladékkezelés vizsgálata. A monszun a Föld legnagyobb hulladék kezelési társasága

Összefoglalás: a közlemény ismerteti a hulladék elsősorban a kórházi fertőző hulladék kezelés helyzetét az indiai Keralában és Tamil Naduban. A fertöző hulladékok által okozott veszélyt hosszú ideig nem vették tekintetbe. Csak 1998-ban jelentette meg az indiai egészsgégügyi miniszter a biomedikális hulladékokra vonatkozó - mérföldkövet jelentő - szabályozást. A közlemény azzal foglalkozik, vajjon az uj szabályozások javitottak-e valamit a kórházak és a környezetvédelem helyzetén. Az intézkedések növelték a kórházak kiadásait, majdhogy azok tönkremeneteléig. Ezek a kiadások különösen a kicsiny, vidéki magánkórházakat sujtották, amelyek távoli területeken is ellátást biztosítanak. A közegészségügyi veszély viszont csupán elméletben csökkent, csak nemkivánatos hatásokkal. A monszun maradt India legnagyobb hulladék kezelő társasága

Kulcsszavak: hulladék, fertőző kórházi hulladék, szabályozás, monszun

Szerkesztő: India általános higiénés viszonyainak a bemutatására az alábbiakban közlünk néhány felvételt.
To show the general hygienic conditions in India we display some photos from the area

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