

**Medical Garbage and the Limits of Global Governance in Contemporary Tamil Nadu, India**

*Nandini Bhattacharya, Caroline Proctor and Sarah Hodges, University of Warwick*

GARNET Working Paper No: 43/08

May 2008

**ABSTRACT**

There is a systemic contradiction in the policies regarding the destruction of medical waste, both organic and inorganic and the promotion by the central and the state governments of stem-cell research, biotechnology and cord-blood banking. One of the reasons for the contradiction is a lack of informed, democratic debate in the public sphere regarding the role of biotechnology and the priorities of the state vis a vis the promotion of research and trade. While the export of stem cells is still regulated, there is much less vigilance on the private hospitals many of which must dispose of their potentially valuable medical waste somehow. Is there a trade in such material? Quite possibly. In contemporary India, legislation and implementation of rules regarding biomedical waste are a grey area, vulnerable to both the rapacity of private corporations, the demand for its products from a large newly urban elite, and the naiveté of government.

Keywords:- India, garbage, health care, regulation, risk, governance

*Address for correspondence*

Sarah Hodges, PhD

History Department

University of Warwick

Coventry CV4 7AL UK

Email: [s.hodges@warwick.ac.uk](mailto:s.hodges@warwick.ac.uk)

## Introduction

In the last two decades or so, the rapid coalescence of India's economy to the economies of nation-states and nation-conglomerates consequent to globalization has complicated and challenged older frameworks of political engagement and governance. Newer paradigms of policy-making and implementation have been necessary in the context of the massive influx of capital and enterprise in many hitherto closed /limited areas of the economy. One area where governments have had to confront the unwelcome consequence of globalization has been the rapid transmission of infectious disease in the contemporary world. As Angus Deaton has pointed out, trade and travel have historically also transmitted disease; however the pace and extent of the danger of infection from new viruses in the contemporary world is unprecedented.<sup>1</sup>

Whereas governments all over the world, including that of India have responded to the challenge of global transmission of diseases such as SARS and avian flu, the implications of global trade and the transmission of disease have assumed new, unfamiliar forms in the present context. This paper will examine one instance where global trade, fear of infection, and the paradigms of local politics are inextricably linked—in an examination of the government's role in policies regarding the trade in medical waste in contemporary Tamil Nadu.

The disposal of human waste has historically been a political issue, and one that provides clear insight into the very soul of a society. In India, where the existence of entire communities of untouchable castes who in their very persons comprised the sum of sanitary systems of any village or towns, political mobilisation and cultural assertion have often been centred round the disposal of waste.<sup>2</sup> The dumping of medical waste in rural Tamil Nadu has given another dimension to the always fraught politics of sanitation in contemporary Tamil Nadu. This paper will argue that the new politics of social protest, rural local self-government and the urban-rural disjuncture have informed the contexts of disposal of medical waste. Moreover, certain categories of waste have also been a resource to those who could sell or re-

---

<sup>1</sup> Angus Deaton, "Health in an age of Globalisation", Research Programme in Development Studies Center for Health and Wellbeing, Princeton University, July 2004,

[http://www.princeton.edu/~rpd/downloads/deaton\\_healthglobalage.pdf](http://www.princeton.edu/~rpd/downloads/deaton_healthglobalage.pdf)

<sup>2</sup> Gita Ramaswamy, *India Stinking: Manual Scavengers in Andhra Pradesh and Their Work*, (Pondicherry, Navayana Publishing, 2005)

use them. The production of recycled waste, or its treatment for use in industry, has also traditionally been the preserve of certain communities. In nineteenth and century India new occupations have emerged, or old occupations re-formed, where traditional communities of waste-gatherers' skills have been harnessed to new industries. One example is tanneries and the production of leather goods, which has been industrialised but where the labour continues to be largely supported by the untouchable castes of *chamars*. A variant is this is the use of *doms* whose task it was to provide services at cremation grounds. Dead bodies were traditionally so ritually impure that the *doms* were relegated to the bottom of the caste system, and had no commensural links with even the low caste untouchables. In colonial India when western medical practices necessitated an intimate handling of dead human bodies, the *doms* often functioned as menials in the mortuaries.<sup>3</sup>

This paper is concerned with a more specialized form of scientific resources derived from human bodies that has the potential to be the source of significant wealth- the human waste from contemporary medical practices- or bio-trash. This paper examines the policies that govern the management of medical waste in contemporary Tamil Nadu. Through a study of the systems of disposal and regulation of biotrash this paper argues that the availability, modes of disposal, the international trade in bio-trash and the regulations governing the political economy of human medical waste is a product of the globalization of the Indian economy, but that government has inadequately addressed the challenges brought forth by the trade in this relatively new resource. It argues further that the modes of disposal, containment, and trade in biomedical waste products reflect new trends in the construction of post-globalization civil society in Tamil Nadu.

### **What is biomedical waste: Government Regulations and Medical Waste**

Waste has often been a resource. For instance, in most parts of urban India and indeed in most of the Third World, the collection of dry and resaleable household waste such as newspapers, glass and certain varieties of plastic by itinerant pedlars which were sold to wholesalers and eventually reintroduced in circulation has precluded contemporary 'green', recycling strategies in developed countries. This form of extracting resources from waste is

---

<sup>3</sup> David Arnold, *Colonizing the Body: state medicine and epidemic disease in nineteenth-century India*, (Berkeley and London, University of California Press, 1993), 5.

also the occupation of people on the margins of urban Indian society.<sup>4</sup> The waste economy in contemporary India is a varied one. With the huge advances in biochemical sciences, there is a massive rise in pharmaceutical and biochemical products which use many parts of the human body for the manufacture of products on an industrial scale. This aspect of the waste economy is extremely valuable, requires specialized technologies for both preservation of the raw materials and eventual commodification, and often involves large industrial enterprises through trade across continents. Bio medical waste falls into what we may call the ‘premium’ trade in human waste. Bio-trash may include any form of organic waste from therapeutic practices- such as amputated limbs, human skin and tissue, cord-blood (derived from the umbilical cord), placenta, as well as inorganic use-and –throw products such as bandages, syringes, dressings, etc. Produced at hospitals and dispensaries everywhere, the volume of the medical waste products is naturally much higher in the urban centres where therapeutic infrastructure is concentrated.

To begin with, we will examine government regulations pertaining to the disposal of medical waste in Tamil Nadu. The regulations regarding the trade in biomedical waste have addressed fears about risk of bio-hazardous materials and methods for controlling the risk rather than referring to broader paradigms of control over the economy of medical waste itself. The initial regulations regarding bio-medical waste measures were derived from Central Government policy guidelines, the first of these being the Environment Protection Act of 1986. The rules define bio-medical waste as ‘any waste which is generated during diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals and including categories mentioned in schedule I. [p.1-2]’.<sup>5</sup>

When they were revised in 1998, the rules allowed for the exemption of any institution treating less than 1000 patients per month from the need for authorisation of their waste

---

<sup>4</sup> Kaveri Gill, “The nature of exchange in Delhi’s waste recovery market: patron-client relations in the urban informal economy”, Centre of South Asian Studies Occasional Paper, No 3, 2004.

<sup>5</sup> *The Gazette of India*, Extraordinary Part II – Section – Sub section (ii), New Delhi, July 27, 1998, Ministry of Environment and Forests Notification, *Bio-Medical Waste (Management and Handling) Rules, 1998*; New Delhi, June 2, 2000, Ministry of Environment and Forests Notification, *Bio-Medical Waste (Management and Handling) (Second Amendment) Rules, 2000*. The Bio-Medical Waste rules are online at [http://dpcc.delhigovt.nic.in/act\\_bmw.htm](http://dpcc.delhigovt.nic.in/act_bmw.htm)

disposal facilities.<sup>6</sup> According to further formulated, the entire country was supposed to have met the regulations by end-December, with the implementation of the rules covering all the health care institutions, cities, towns and villages. Such was not the case; in a study of the disposal of biomedical waste in Coimbatore, one author discovered serious flaws in the implementation of regulations.<sup>7</sup> He found biomedical wastes of all types simply being relayed to municipal dumping grounds where they were often harvested by rag pickers. He particularly emphasised the prohibitive costs of incinerator provision and recommended charges for medical treatments as a way of financing. One interesting aspect of the regulation cited above is that smaller medical institutions were not covered by the legislation at all. There is scant evidence of what such smaller hospitals and dispensaries do with their garbage. If they enter the market, as seems very likely, they are part of the ubiquitous parallel, or 'black' economy as it was referred to in a more innocent age.

How about the modes of disposal in the large medical institutions? Initially, most hospitals in the state supplied themselves with incinerators, a move supported by the World Bank. Incinerators however are now considered an environmental hazard, and the Tamil Nadu Health Care Waste Management Plan (April 2005), compiled by the Department of Health and Family Welfare, Government of Tamil Nadu, included regulations and regulation history for the region.<sup>8</sup> The plan regulates public and private hospitals and institutes training of staff. The program was part of the broader, World Bank-funded Health Systems Project in operation in Tamil Nadu, and suggested that

As per the bio medical waste handling rules, a proper system of segregation, storage, transportation and end disposal has been proposed to be implemented in all institutions. The Tamil Nadu Health Systems Project had piloted the bio medical waste management system in all the hospitals in Dharmapuri and Krishnagari districts

---

<sup>6</sup> *The Gazette of India*, Extraordinary Part II – Section – Sub section (ii), New Delhi, July 27, 1998, Ministry of Environment and Forests Notification, *Bio-Medical Waste (Management and Handling) Rules, 1998*; 3-4.

<sup>7</sup> V. Mohandasundaram, "The Environmental Implications and Economic Issues in Bio-Medical Waste Management in Urban Coimbatore, Tamilnadu, India" in *Proceedings of the Third International Conference on Environment and Health, Chennai, India, 15-17 December, 2003*, eds. Martin J. Bunch, V. Madha Suresh and T. Vasantha Kumaran, (Chennai: Department of Geography, University of Madras and Faculty of Environmental Studies, York University), 270-275.

<sup>8</sup> Government of Tamil Nadu, Department of Health and Family Welfare, Tamil Nadu Health Systems Project, *Health Care Waste Management Plan for Hospitals in Tamil Nadu* (April 2005).

during phase I of the Project [Jan 2005 –June 2006]. During the year 2006-2007 it would be extended to all secondary care hospitals in the State<sup>9</sup>

The plan centred on the replacement of all incinerators or the burning of waste. Within the recommendations, human tissue was listed first in the category of biomedical waste substances. The report noted that most biomedical waste in the above named districts was being disposed of, without treatment along with municipal solid waste and by burning. The untreated liquid waste from the health institutions is let into drainage. The rules outline that:

Human tissue, body parts and placenta collected from OT, labour rooms & wards are segregated and collected in yellow plastic bags kept in yellow buckets. This is disposed of by deep burial in the common treatment facility. [p. 8/10]

By April 2005, the Tamil Nadu Pollution Control Board (TNPCB) had listed 317 government hospitals and 1835 private hospitals and had issued directions to both to take time bound action to identify sites and set up common facilities for the management of biomedical waste. Therefore so far as government regulations were concerned, incinerators and deep burial were to form the principal means of disposal of medical waste.

### **Lack of Implementation, urban –rural disjuncture**

The implementation of the regulations left much to be desired. The lacunae in hospital waste disposal procedures were exposed and emphasised in certain sections of the media. The *Hindu*, a long-established daily with the highest circulation among English newspapers in Tamil Nadu, carried in March 2002 and again in June 2004 strong criticism of the neglect of the management of bio-trash in hospitals and dispensaries.<sup>10</sup> The articles pointed out that bio-medical waste, including amputated body parts, were not segregated at several government

---

<sup>9</sup> Thiru K.K.S.S.R. Ramachandran, *Policy Note on Health and Family Welfare, 2006-7: Demand No.19: Health and Family Welfare*; see also G.O (4D) No.6, *World Bank aided Tamil Nadu Health System Development Project*, 23.6.2003, at <http://www.tn.gov.in/gorders/hfw/hfw-e-6-4D-2003.htm> viewed on 17/02/2007.

<sup>10</sup> Karthik Subramanian and Ramya Kanan, “Biomedical waste being disposed of casually,” <http://www.hinduonnet.com/2004/06/10/stories/2004061006820100.htm> viewed on 22/2/2008; “Biomedical wastes pile up in front of Kavindapady Government Hospital”, <http://www.hindu.com/2007/12/01/stories/2007120152510300.htm> viewed on 22/2/2008; K. Lakshmi “Norms given the go-by in govt. Hospitals,” <http://www.hinduonnet.com/2003/03/24/stories/2003032406540300.htm> viewed on 07/06/2006;

hospitals along with other waste materials. This resulted in garbage trucks in dumping bio-trash, including prospectively infective medical waste such as amputated limbs, into common waste-fills or simply thrown away in the immediate vicinity of the hospital in question. The articles suggested that private hospitals had a much better record in disposing of bio-medical waste. In 2001, *Pharmabiz*, a web journal for and by the Indian pharmaceutical industry, highlighted that the ‘state projects for biomedical waste disposal facilities at Chennai, Trichy, Tanjavur and Tirunelveli ... are stuck with multiple reasons including government indecision and other political and technical reasons....’<sup>11</sup> The project was to be undertaken by a private company, Healing Medicaids. It also pointed out that the cost for incinerating biomedical waste was prohibitive for hospitals. The government plan held in abeyance had included that several hospitals combine and have common incinerators and autoclaving apparatus.

Besides the print media, certain non-government organisations (NGOs) continued to point out the gap between existing laws and their implementation. *Toxic Links*, a ‘group of people working together for environmental justice and freedom from toxics’ was one such.<sup>12</sup> It campaigned vigorously for safer methods of disposal of medical waste. Best practice in this field is being spread largely by NGOs, as shown by leaflets produced by the C.P.R. Environmental Education Centre, based in Chennai (2004).<sup>13</sup> The pamphlet, ‘Understanding and simplifying bio-medical waste management: A training manual for trainers’ and the workshops run by Toxics Link (part of CAG: Citizen consumer and civic Action Group) are crucial to actually implementing the regulations on BMW.<sup>14</sup> Toxics Link have been campaigning for a long time in this area, viewing the original 1998 BMW Rules as one of their major victories. Toxics Link in Chennai is especially concerned with monitoring BMW. They say:

On the issue of BMW, we have been working with private and government institutions. We audit, train and try to implement the system of BMW management in

---

<sup>11</sup> “Four biomedical waste projects in TN in doldrums”, *Pharmabiz*, 29 Nov 2001, at <http://www.pharmabiz.com/article/detnews.asp?articleid=16648&sectionid=50>, viewed on 20/06/06.

<sup>12</sup> “Our Mission”, [www.toxicslink.org](http://www.toxicslink.org) viewed on 22/2/2008.

<sup>13</sup> “Publications & Resource Materials”, <http://cpreec.org/>.

<sup>14</sup> Anu Agrawal, Ratna Singh, “Understanding and simplifying bio-medical waste management: A training manual for trainers”, <http://www.toxicslink.org/pub-view.php?pubnum=79>

the health care institutions. We had created model private and government health care institutions so that it has a ripple effect.<sup>15</sup>

In 2004, the Health Secretary of Tamil Nadu announced that failure to follow the bio-medical waste rules would render concerned hospitals liable to prosecution.<sup>16</sup> The disposal of medical waste became a public issue; regular articles featured in the media, both print and electronic, and became a part of civic action. When undertaken on a more systematic level than direct dumping outside the hospitals themselves, the strategy seemed to comprise building landfills in rural areas. In September 2005, the Tamil Nadu Waste Management Ltd [Hyderabad-based Ramky Associates' subsidiary] attempted to locate a landfill and incinerator in the vicinity of Gummidipoondi and neighbouring areas disregarding objections from the local panchayat. Local womens' collectives, with the panchayat, actively opposed the construction and policed the area to prevent the illegal dumping of medical wastes in the area.<sup>17</sup> The existence of so much campaigning at a local level would seem at odds with the 'popular blindness' described by Dipesh Chakrabarty in 1991.<sup>18</sup> Can this be explained in terms of an articulation of the politics of representation in present-day rural India ( a working panchayati system) which is struggling against the urban-rural disjuncture in contemporary urban civil society and the state?

### **The Premium Trade- Regulation by industry**

In December 2006, many skulls and bones were discovered in the drain in Nithari, a village in NOIDA near Delhi. This was the beginning of a story that fascinated the national imagination and created outrage and panic. With all sections of the media camped at the formerly obscure village for weeks on end, many grisly details of the mass killings emerged. The victims were children from the slums situated next to the large bungalows that have lately been built in the area, and provided a now-familiar background of the starkness of the urban and semi-urban poverty of immigrant labourers, a venal and complicit local police, and the contempt of the rich and the influential in contemporary India for the rule of law.<sup>19</sup> What

---

<sup>15</sup> Email from K.S. Sudhakar to Sarah Hodges, 18/09/2006.

<sup>16</sup> "Incinerator site identified", <http://www.saeindia.org/News/SAE-coverage.htm> viewed on 20/06/2006.

<sup>17</sup> Nityanand Jayaraman "Residents stop toxic waste landfill work," <http://southasia.oneworld.net/article/view/128436/1/>

<sup>18</sup> D. Chakrabarty, "Open Space/Public Space: Garbage, Modernity and India," *South Asia* 14 (1991), 15-31.

<sup>19</sup> Etmad A.Khan, Mihir Srivastava, Sanjay Dubey, "Exposed: The Unacceptable Shame of Nithari", [http://www.tehelka.com/story\\_main26.asp?filename=ts021007exposed.asp](http://www.tehelka.com/story_main26.asp?filename=ts021007exposed.asp).



is interesting for our purposes is that for weeks after the bodies were discovered, most people in the area and elsewhere believed that the killings were for the purpose of harvesting organs.<sup>20</sup> The anxieties in the national press and public discourse in the episode reflect a more general disquiet about profiteering in the trade in human body parts.<sup>21</sup> These anxieties, centred round the more spectacular trade in human body parts, rarely extend to concern, informed or otherwise, about the trade in bio-trash. One reason is that the technological production processes and indeed the highly specialized manufacture and trade is the very specialization of the manufacture, attributing a sanctity and esoteric content associated with technical production, is rarely interrogated in contemporary public culture.

Another aspect of bio-medical waste, therefore, is the lucrative trade in certain products, especially blood, cord-blood, placenta, all of which are in demand in the pharmaceutical industry. The rise in prominence of the biotech industry, and within that the biomedical sector, in India is well-attested is striking. Since 1986, the central and state governments in India have promoted it and accorded the industry special status. Various state governments have vied with each other to facilitate infrastructure for biotechnology; it is both a means of profitable international trade and symbolically, epitomises India's status in internationally in scientific and technical expertise. Karnataka was the first state to announce a 'millenium' biotech policy in 2001; followed later in the year by Maharashtra, Tamil Nadu, Himachal Pradesh and Andhra Pradesh in 2002. The TICEL biopark in Chennai opened in November 2004, 'This marks the determined bid by Tamil Nadu to forge ahead in the life sciences research and development and reach the future frontiers of biotechnology.'<sup>22</sup>

A particular growth industry in Chennai, and elsewhere, is cord-blood-banking. This has become increasingly privately motivated. The Government of India has consulted with Cryo-Cell Private Ltd., which is based in China and with Reliance Life Sciences, Mumbai, on new stem cell policy guidelines.<sup>23</sup> LifeCell (Cryo-Cell), are aiming to use plureon cells from the

---

<sup>20</sup> "Organ trade angle ruled out in Nithari killings", <http://www.hinduonnet.com/2007/01/28/stories/2007012803981000.htm>

<sup>21</sup> Ramdas Ambulgekar, 'Organ transplant and the black market' <http://www.issuesinmedicalethics.org/033mi048.html>; C.Raj Kumar, "Nithari and the system of governance", <http://www.thehindu.com/2007/02/09/stories/2007020902051000.htm>

<sup>22</sup> 9th Feb 2006, <http://www.biospectrumindia.com/makesections.asp/060291.asp/> viewed on 02/10/2006.

<sup>23</sup> <http://www.biospectrumindia.com/cgi-bin/printer.asp?id=74036> viewed 02/10/2006; "Ticel Bio-Park Inaugurated", <http://www.biospectrumindia.com/content/news/10412161.asp> viewed on 02/10/2006.

placenta which could help to grow bone, muscle, nerve, fat, liver and pancreatic cells according to *Pharmabiz*, 25<sup>th</sup> October 2006. CryoCell's own website proclaims:

The placenta, usually discarded as medical waste, has recently been discovered to be a rich source of unique, pluripotent stem cells.<sup>24</sup>

Plans for a national network of public cord blood banks were announced in India in 2005 and the Indian government signed a deal with the Korean company Histostem to set up a bank in Mumbai with additional centres planned in Delhi, Chennai and Kolkata (the government has 10% equity in this venture). Reliance Life Sciences are primarily oriented towards public banking, LifeCell is strictly private. A new centre exclusively for stem cell transplants will be operational in Chennai in 2006; this transplant centre is a joint venture of Lifecell and the Sri Ramachandra Medical Centre.

What are the legal ramifications of the trade in various human parts? At present, stem cell research is governed only through guidelines from within the industry itself or by the Indian Council of Medical Research.<sup>25</sup> The trade in body parts/tissues is a key concern within their guidelines as the introduction states:

It[stem cell research] also raises several ethical and social issues such as destruction of human embryos to create human embryonic stem (hES) cell lines, *potential for introducing commodification in human tissues and organs with inherent barriers of access to socio-economically deprived* and possible use of technology for germ-line engineering and reproductive cloning. [2, my emphasis]

Two of the general principles underpinning all Indian stem cell research guidelines, relevant to our study, are: 'Justice with equitable distribution of burden and benefits' and 'Non-maleficence with the aim of minimization of risk and maximization of benefit' [p.3]. Consent from living donors is also key. A national umbilical cord stem cell bank is proposed. (pp.4-5).

---

<sup>24</sup> <http://www.cryo-cell.com/services/plureon.asp>

<sup>25</sup> "ICMR-DBT Guidelines for Stem Cell Research and Therapy – Draft – 2006". These guidelines currently under development emerge from the "Ethical guidelines for Biomedical Research on Human Subjects" issued by the Indian Council of Medical Research in October 2000. See <http://www.icmr.nic.in/ethical.pdf> The guidelines were framed in 1992 but only finalised after several rounds of discussions in 2000. These guidelines define human material with the potential for use in biomedical research as organs and parts of organs, cells and tissue, sub-cellular structures and cell products, blood, gametes (sperm and ova), embryos and foetal tissues and wastes (urine, faeces, sweat, hair, epithelial scales, nail clippings, placenta and cell lines from human tissues).

Any trials sponsored by multinationals, involving stem cell products imported from abroad are a restricted area of research and require more detailed screening (6).

If there is a conflict between scientific and ethical perspectives of the International collaborator and the domestic side then Indian Ethical guidelines or law will prevail. (p.12)

There is a special section (section 7.0) on umbilical cord blood banking; all banks are to be registered with the Drug Controller General of India (as are blood banks):

Purpose of banking should be clearly explained to couples interested in storing cord blood ... the ethical issues include concern about ownership ... when it comes to registries and banking, the commercial aspects pose additional problems. (6-7)

In this document placenta comes under foetal stem cells, with no real emphasis other than that:

termination of pregnancy should not be sought with a view to donate foetal tissue in return for possible financial or therapeutic benefits ... There should be no commodification of human egg, human sperm or human embryo by way of payment or services, except for reimbursement of reasonable expenses incurred by the person. (p.7/9)

At the moment no stem cell based treatments are approved (except bone marrow and in the case of clinical trials) but there are many clinics offering the treatments in India, an indication of the lag in response of legislation and enforcement.<sup>26</sup> The guidelines issued by the Indian Council of Medical Research evidently do not address several aspects of the bio-medical waste trade. The problematic vagueness of legislation in this field is highlighted by Naomi Pfeffer and others: ‘globalisation of research and commercial applications of tissue has not yet been recognised in guidelines produced by national regulatory bodies.’<sup>27</sup> Also:

---

<sup>26</sup> See Bindu Shajan Perappadan, “Misuse of Miracle Cure Feared,” <http://www.thehindu.com/2005/03/25/stories/2005032519630300.htm> for example.

<sup>27</sup> Wellcome Trust funded research into, “Ethical Issues in the Collection of Pregnancy-related Tissue Samples” done by Naomi Pfeffer amongst others, 2001-2003.

In deciding where to source human tissues and cells, companies behave like merchant/tourists, shaping a new market for human tissues and cells and reinforcing their commodification. Concepts of “surplus” embryos created for IVF treatment as “waste” have been acknowledged as extremely controversial but the use of this term in relation to other sources of stem cells have been regarded in policy circles as relatively straightforward. Yet these alternatives have recently become more problematic, both in terms of quality issues and potential transmission of disease. And our research found divergent views about the exploitation of other material, including blood, placental tissue, foetuses, and cord blood...<sup>28</sup>

The regulation of medical waste was therefore not only unregulated by government; but even the regulation by the industry itself has not sufficiently addressed it. While its regulation has fallen in the interstices between government policy and self-regulation by industry, the value of the trade itself is undiminished; leading one to ask in what contexts would greater regulation be facilitated.

### **Bio-medical waste, the inadequacy of health governance and post-globalized civil society**

Angus Deacon suggested that the transfer of technologies have the potential to facilitate a rise in life-expectancy in developing countries, and that to facilitate health welfare, more, not less globalization is needed. Indeed, the spectre of AIDS, has emphasised the connect between the countries formerly within the First and the Third Worlds, the inadequacy of nation- states, the fragility of contemporary policies in the face of the relentless spread of the disease. In debates on health and governance, however, while infectious diseases achieve the attention of policy makers and receive scholarly attention, the implications, local and global, of the bio-trash trade on governance and politics have not been examined in similar detail. This paper above has pointed out the insufficiency of regulations in the trade and configured some of the problematic of the non-regulation of this industry.

---

<sup>28</sup> Memorandum to Select Committee on Science and Technology from Professor Naomi Pfeffer and Dr Julie Kent, October 2004, at <http://www.publications.parliament.uk/pa/cm200405/cmselect/cmsctech/7/7we64.htm> .

There is a systemic contradiction in the policies regarding the destruction of medical waste, both organic and inorganic and the promotion by the central and the state governments of stem-cell research, biotechnology and cord-blood banking. One of the reasons for the contradiction is a lack of informed, democratic debate in the public sphere regarding the role of biotechnology and the priorities of the state vis a vis the promotion of research and trade. The lack of such a debate is occasioned by public culture in contemporary India generally- while there is extensive and even spectacular coverage of the Nithari killings and its initial allegations with unscrupulous organ traders, the functioning of private cord-blood banks and the activities of multinational pharmaceutical companies are neither covered by the mainstream media nor find a place in popular debate. While the export of stem cells is still regulated, there is much less vigilance on the private hospitals many of which must dispose of their potentially valuable medical waste somehow. Is there a trade in such material? Quite possibly. In contemporary India, legislation and implementation of rules regarding biomedical waste are a grey area, vulnerable to both the rapacity of private corporations, the demand for its products from a large newly urban elite, and the naiveté of government.

## References

1. Indian Council of Medical Research in October 2000. "ICMR-DBT Guidelines for Stem Cell Research and Therapy – Draft – 2006". <http://www.icmr.nic.in/ethical.pdf>
2. "Incinerator site identified", <http://www.saeindia.org/News/SAE-coverage.htm> viewed on 20/06/2006.
3. "Organ trade angle ruled out in Nithari killings", <http://www.hinduonnet.com/2007/01/28/stories/2007012803981000.htm>
4. "Our Mission", [www.toxiclink.org](http://www.toxiclink.org) viewed on 22/2/2008.
5. "Publications & Resource Materials", <http://cpreec.org/>. viewed 9th Feb 2006, <http://www.biospectrumindia.com/makesections.asp/060291.asp/> viewed on 02/10/2006.
6. Angus Deaton, "Health in an age of Globalisation", Research Programme in Development Studies Center for Health and Wellbeing, Princeton University, July 2004, [http://www.princeton.edu/~rpd/downloads/deaton\\_healthglobalage.pdf](http://www.princeton.edu/~rpd/downloads/deaton_healthglobalage.pdf)
7. Anu Agrawal, Ratna Singh, "Understanding and simplifying bio-medical waste management: A training manual for trainers", <http://www.toxiclink.org/pub-view.php?pubnum=79>
8. D. Chakrabarty, "Open Space/Public Space: Garbage, Modernity and India," *South Asia* 14 (1991)
9. David Arnold, *Colonizing the Body: state medicine and epidemic disease in nineteenth-century India*, (Berkeley and London, University of California Press, 1993)
10. Email from K.S. Sudhakar to Sarah Hodges, 18/09/2006.
11. Etmad A.Khan, Mihir Srivastava, Sanjay Dubey, "Exposed: The Unacceptable Shame of Nithari"
12. Gita Ramaswamy, *India Stinking: Manual Scavengers in Andhra Pradesh and Their Work*, (Pondicherry, Navayana Publishing, 2005)
13. Government of Tamil Nadu, Department of Health and Family Welfare, Tamil Nadu Health Systems Project, *Health Care Waste Management Plan for Hospitals in Tamil Nadu* (April 2005).
14. <http://www.biospectrumindia.com/cgi-bin/printer.asp?id=74036> viewed 02/10/2006; "Ticel Bio-Park Inaugurated", <http://www.biospectrumindia.com/content/news/10412161.asp> viewed on 02/10/2006.
15. <http://www.cryo-cell.com/services/plureon.asp>

- <http://www.hinduonnet.com/2004/06/10/stories/2004061006820100.htm> viewed on 22/2/2008; “Biomedical wastes pile up in front of Kavindapady Government Hosptial”,  
<http://www.hindu.com/2007/12/01/stories/2007120152510300.htm> viewed on 22/2/2008;  
 K. Lakshmi, “Norms given the go-by in govt. Hospitals,”  
<http://www.hinduonnet.com/2003/03/24/stories/2003032406540300.htm> viewed  
[http://www.tehelka.com/story\\_main26.asp?filename=ts021007exposed.asp](http://www.tehelka.com/story_main26.asp?filename=ts021007exposed.asp).
16. Karthik Subramanian and Ramya Kanan, “Biomedical waste being disposed of casually,”  
<http://www.hinduonnet.com/2004/06/10/stories/2004061006820100.htm>
17. Kaveri Gill, “The nature of exchange in Delhi’s waste recovery market: patron-client relations in the urban informal economy”, Centre of South Asian Studies Occasional Paper, No 3, 2004.
18. Memorandum to Select Committee on Science and Technology from Professor Naomi Pfeffer and Dr Julie Kent, October 2004, at  
<http://www.publications.parliament.uk/pa/cm200405/cmselect/cmsctech/7/7we64.htm>
- 
19. Nityanand Jayaraman “Residents stop toxic waste landfill work,”  
<http://southasia.oneworld.net/article/view/128436/1/>  
 on 07/06/2006; “Four biomedical waste projects in TN in doldrums”, *Pharmabiz*, 29 Nov 2001, at <http://www.pharmabiz.com/article/detnews.asp?articleid=16648&sectionid=50> ,  
 viewed on 20/06/06.
20. Ramdas Ambulgekar, ‘Organ transplant and the black market’<http://www.issuesinmedicalethics.org/033mi048.html>; C.Raj Kumar, “Nithari and the system of governance’,  
<http://www.thehindu.com/2007/02/09/stories/2007020902051000.htm>
21. Bindu Shajan Perappadan, “Misuse of Miracle Cure Feared,  
<http://www.thehindu.com/2005/03/25/stories/2005032519630300.htm> for example.
22. *The Gazette of India*, Extraordinary Part II – Section – Sub section (ii), New Delhi, July 27, 1998, Ministry of Environment and Forests Notification, *Bio-Medical Waste (Management and Handling) Rules, 1998*; New Delhi, June 2, 2000, Ministry of Environment and Forests Notification, *Bio-Medical Waste (Management and Handling) (Second Amendment) Rules, 2000*. The Bio-Medical Waste rules are online at  
[http://dpcc.delhigovt.nic.in/act\\_bmw.htm](http://dpcc.delhigovt.nic.in/act_bmw.htm)

23. *The Gazette of India*, Extraordinary Part II – Section – Sub section (ii), New Delhi, July 27, 1998, Ministry of Environment and Forests Notification, *Bio-Medical Waste (Management and Handling) Rules, 1998*
24. Thiru K.K.S.S.R. Ramachandran, *Policy Note on Health and Family Welfare, 2006-7: Demand No.19: Health and Family Welfare*; see also G.O (4D) No.6, *World Bank aided Tamil Nadu Health System Development Project*, 23.6.2003, at <http://www.tn.gov.in/gorders/hfw/hfw-e-6-4D-2003.htm> viewed on 17/02/2007.
25. V. Mohandasundaram, “The Environmental Implications and Economic Issues in Bio-Medical Waste Management in Urban Coimbatore, Tamilnadu, India” in *Proceedings of the Third International Conference on Environment and Health, Chennai, India, 15-17 December, 2003* , eds. Martin J. Bunch, V. Madha Suresh and T. Vasantha Kumaran, (Chennai: Department of Geography, University of Madras and Faculty of Environmental Studies, York University)
26. Wellcome Trust funded research into, “Ethical Issues in the Collection of Pregnancy-related Tissue Samples”, Naomi Pfeffer amongst others, 2001-2003.