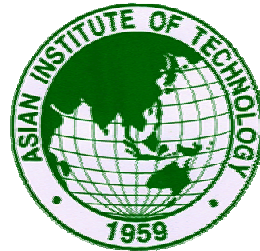


Medical Waste Management Issues in Asia



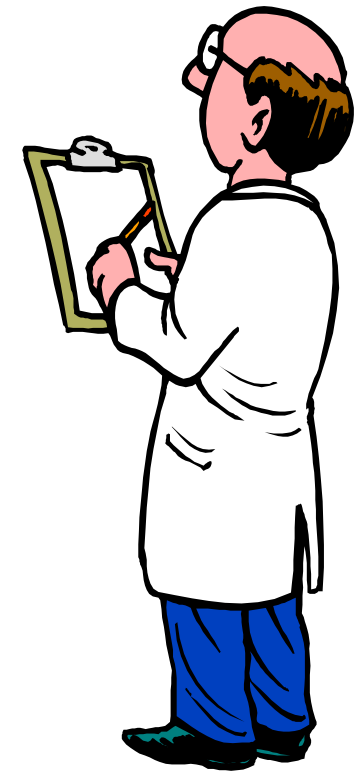
C. Visvanathan
Environmental Engineering & Management Program
Asian Institute of Technology
Thailand

visu@ait.ac.th
Web: <http://www.faculty.ait.ac.th/visu/>

Asia 3R Conference, 30 October – 1 November, 2006
Tokyo, Japan

Contents of Presentation

- ✓ Overview of Health Care Waste Management
- ✓ Medical Waste Generation in Asia
- ✓ Treatment Technologies and Disposal Issues
- ✓ Legislations, Institutional and Policy Issues
- ✓ Bangkok Metropolitan: Case Study
- ✓ Scope of 3Rs in Medical Waste Management

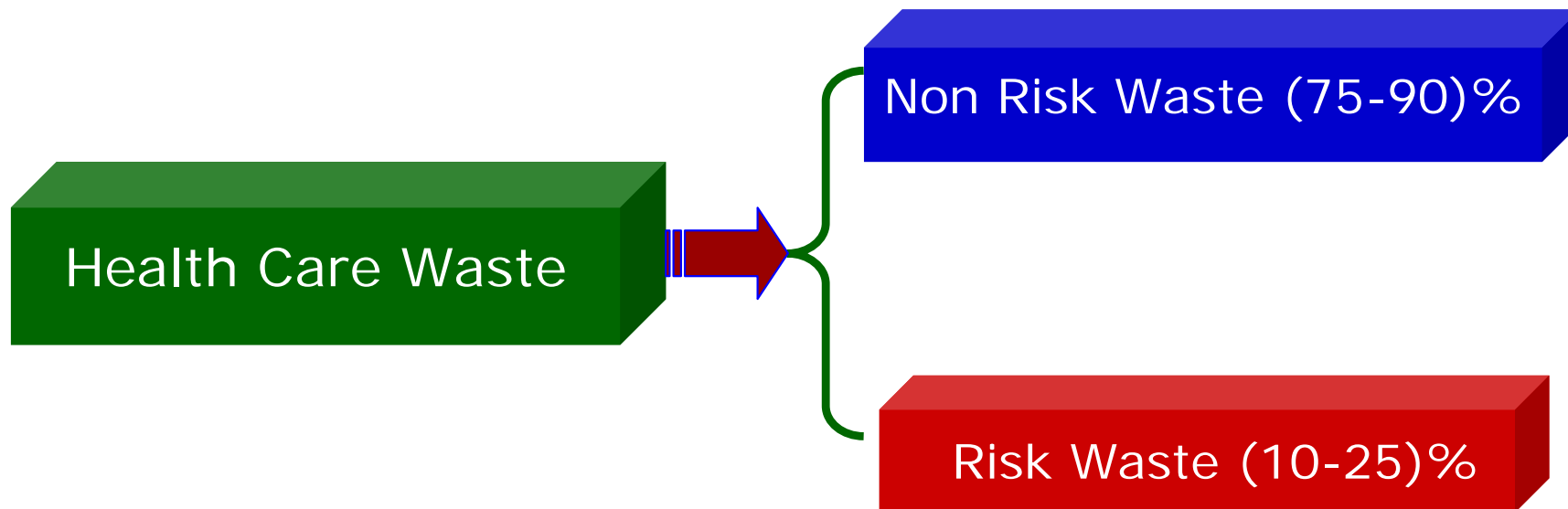


Overview of Health Care Waste Management

What is Health Care Waste?

Total waste generated by hospitals, healthcare establishments and research facilities in the diagnosis, treatment, immunization and associated research

Health Care Waste Characterization:



Overview of Health Care Waste Management



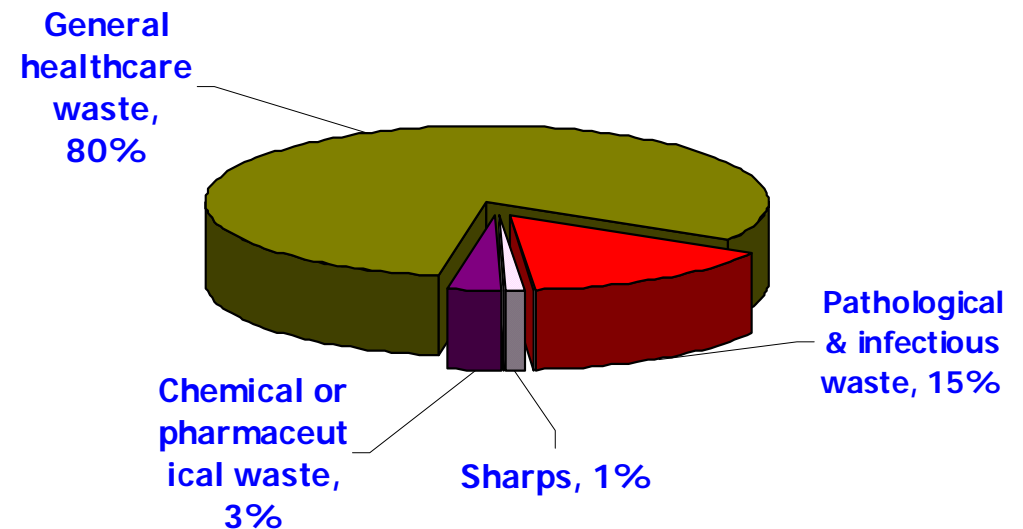
Medical Waste Generation in Asia

Estimates of medical waste generation in some countries

Country	Waste generation (kg/bed/day)	Total waste generation (tons/year)
Bangladesh	0.8 - 1.67	93,075 (only in Dhaka)
Bhutan	0.27	73
China	-	730,000
India	1 - 2	330,000
Malaysia	1.9	-
Nepal	0.5	365
Pakistan	1.06	250,000
Sri Lanka	0.36	6,600 (only in Colombo)
Thailand	0.68	
Metro Manila (Philippines)		17,155
Vietnam	2.27 (Hanoi)	60,000

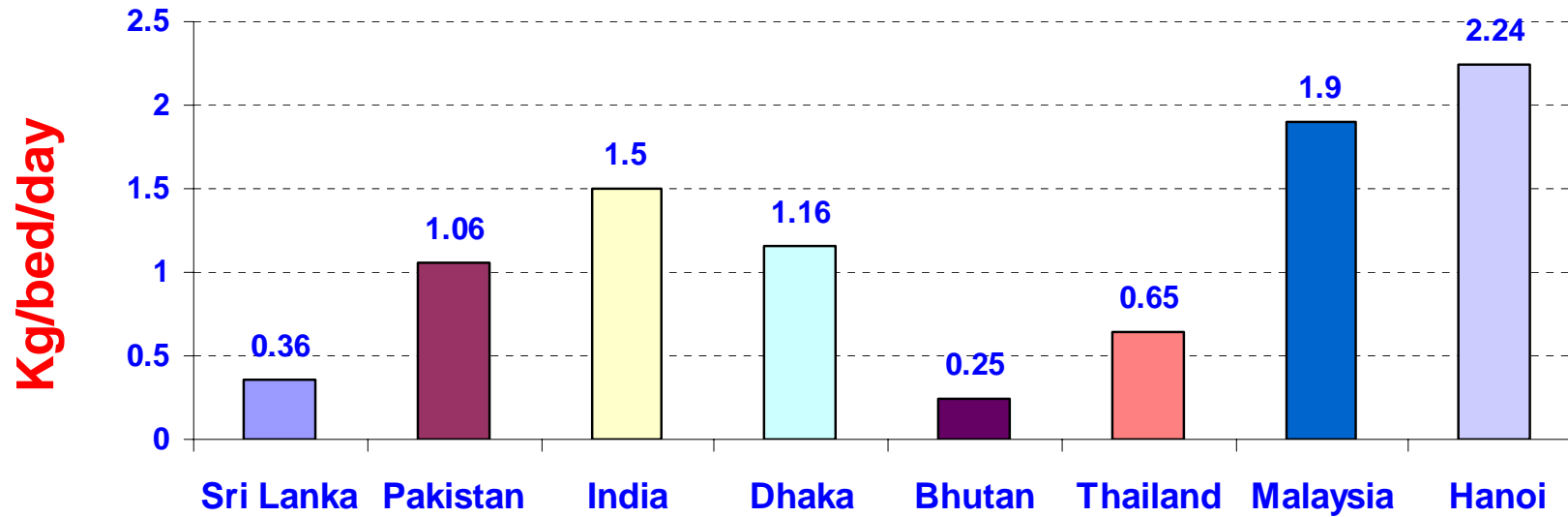
Medical Waste Generation in Asia

- ❖ 0.33 million tons/year in India
- ❖ 0.25 million tons/year in Pakistan
(100 ton/day from Karachi alone)
- ❖ 2,000 tons/day in china
- ❖ 60,000 tons/year in Vietnam
- ❖ 255 tons/day in Dhaka alone
- ❖ 47 tons/day in Metro Manila
(11 tons/day illegally dumped)



Healthcare waste composition in developing Asian countries
(WHO, 1999)

Medical Waste Generation in Asia



Estimated average healthcare waste generation in some Asian countries

Treatment Technologies: Comparison

	Treatment Technologies				
	Incineration	Autoclave	Microwave	Chemical Disinfection	Plasma Pyrolysis
Investment/ Operating cost	High	Moderate	High	Low	High
Suitability Of the waste	Not for radioactive	All except Pathological	All except cytotoxic, radioactive	Liquid waste	All
Ease of Operation	No	Yes	Yes	Yes	No
Waste Volume reduction	Significant	Less	Significant		Significant
Odour Problems	Yes	Slight	Slight	Slight	-
Environmental friendly	No	Yes	Yes	No	Yes

Treatment Technologies & Disposal Issues

- Wastes not segregated & disposed off together with municipal solid waste
- Mixing of hospital wastes with general waste
 - Lack of segregation is making whole waste stream hazardous
- No regulated disposal sites for medical Waste
- Open burning by clinics, dispensaries, & some hospitals
- In many countries incineration is common method of treatment e.g, Malaysia, Vietnam, Thailand (about 750 medical waste incinerators)



Treatment Technologies & Disposal Issues

- ❖ Incinerators are old and poorly managed, Lack of close monitoring & inadequate maintenance creating threat to general public
- ❖ Operated more like a back-yard burner, do not reach required temperature, & lack control equipment to capture targeted pollutants such as dioxins, mercury, cytotoxic emissions
- ❖ Inadequate ash treatment & handling (disposed in municipal dumpsite)
- ❖ Hospital waste incinerators, the biggest polluters in Delhi (*The Hindu*, April, 2004)
- ❖ Illegal transboundary movement
 - Japanese government shipped back tons of hospital waste illegally exported to the Philippines in 2000 (*Asian Economic News*, January, 2000)



State of Legislations & Related Issues

✓ Legislations:

- No specific legislation directly to medical waste in many South Asian countries like Bangladesh, Nepal
- Basic legislations related to healthcare in some countries e.g. India but Lack of enforcement & unsatisfactory implementation

✓ Regulations and standards:

- On the early stage of development, implementation & enforcement of rules are still underway

✓ Informal sectors:

- Largely involved in recycling and reusing medical waste items



Medical waste scavenging

Institutional & Policy Issues

- Lack of coordination between different authorities & stakeholders
- Missing definition of responsibilities of authorities in charge
- Lack of comprehensive medical waste philosophy at the national level
- Lack of Centralized facilities of small quantity medical wastes generators
- Insufficient research data to determine actual public health problems from medical wastes
- Low awareness of the risks of healthcare waste to animate government policy & public demand for the proper treatment



Bangkok Metropolitan: Case Study

Incineration by Private Contractor

- ✓ Operated by Bangkok Thanakom Co., Ltd (cost of \$153/ton)
- ✓ Disposal of infectious waste from Bangkok hospitals: 16 tons/day



Bangkok Metropolitan: Case Study



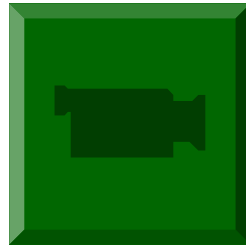
(Nonthaburi, Thailand)

Spoiled medicine capsule together with MSW



Infectious waste in red plastic bag co-disposed with MSW

Hospital Waste Management : Bangkok Metropolitan Administration



Good Practices: Example

Hospital waste management Khulna City: Bangladesh

- ✓ World Bank program (implemented by Prodipan, an NGO): Started 20 private hospitals and laboratories participated (now 42);
- ✓ Each of participating institutions pay US\$ 1.5 - 9/month depending on the volume of waste generated;
- ✓ Collection staffs collect and transport the waste;
- ✓ Segregation in different categories: Infectious is incinerated, plastic items are disinfected and destroyed by a shredder, sharps (e.g. needles, blades) and placed in a concrete pit with a lockable lid.

All is not bad in Asian Health Care Waste Management

❖ Greater attention given to improve legislation and guidelines

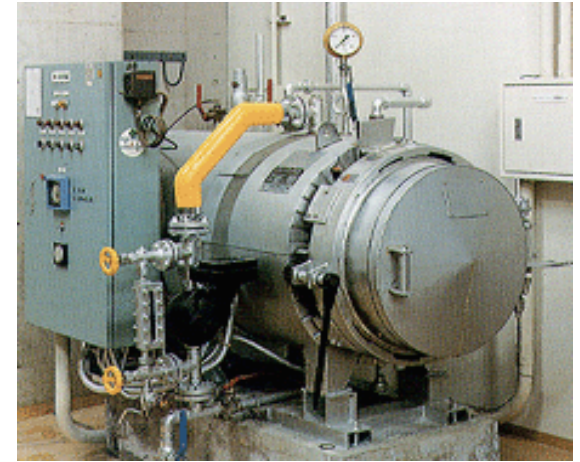
- Philippines: Clean Air Act (1999) prohibiting the hospitals to incinerate their waste
- Vietnam (Ministry of Health): 'Regulation on Healthcare waste Management' (1999)
- China (PRC): 'Regulation on Administration of Medical Waste' 2001
- Pakistan: Hospital waste Management Rules, August 2005



All is not bad in Asian Health Care Management

❖ Moving towards better technologies

- In India installation of individual incinerators is also discouraged, health & healthcare units are urged to treat their waste in common biomedical waste treatment facilities
- Many private hospitals in India → non-burn technology (autoclaving, microwave disinfection)
- Chinese government stipulated centralized medical waste treatment facilities



Autoclave



Microwave

All is not bad in Asian Health Care Management

❖ NGOs, communities playing vital role

- **Campaigning against incineration in India:** An NGO, named Sristi, played a key role in discouraging incineration technology, pushed for court intervention successfully to direct authority to emphasize non- burn technology
- **Campaigning for Environmental Education in India:** With support from WHO, the Centre for Environmental Education in India developed a national kit on biomedical waste management to educate people
- **Campaigning against incineration in Thailand:** Anti-incineration campaign in Thailand moving forward, number of NGOs (including Greenpeace) now pay attention to environmental issues
- **Campaigning for Public awareness around Asia:** Health care without harm, Global Alliance of Incinerator Alternatives (GAIA) raising public awareness to end incineration of waste

Scope of 3Rs in Medical Waste Management

Reduce (source reduction) has higher potential to be implemented in medical waste management

Benefits of source reduction

- ✓ Resources conservation;
- ✓ Reduction of collection, transportation, and disposal costs;
- ✓ Decreased pollution control liability, regulatory & compliance costs

Segregation and handling of generated waste

- ✓ Reducing the toxicity of waste → reduces the threat to the general public from medical waste
- ✓ Segregation reduces the volume & toxicity of waste stream;
- ✓ Proper procurement practices such changing the products and materials can help to reduce the harm (Hg based thermometer can be substituted by electronic sensing devices)
- ✓ Increasing awareness of hospital staffs, employee training in hazardous materials management and waste minimization

Key Points from Discussion

**3 R South Asia Expert Workshop, 30 August - 1 September, 2006
Kathmandu, Nepal**

- ❖ Segregation of bio-hazardous wastes is not widely practiced, If practiced also color coding vary
- ❖ Regional standards need to be implemented in terms of waste color coding
- ❖ Greater care should be taken in terms of the radioactive waste
- ❖ Proliferation of medical clinics & other medical waste sources, often unregistered, has accelerated exposure to bio-hazardous medical waste
- ❖ Hospitals should be directly responsible for waste management (like an industry)

Key Points from Discussion

**3 R South Asia Expert Workshop, 30 August - 1 September, 2006
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- ❖ Government and public hospitals should act as the leaders and models in demonstrating safe disposal of medical waste
- ❖ Establishment of better communication & sharing information about the risks from medical waste among all shareholders (hospitals, other medical facilities, community and public) is very important
- ❖ Public awareness is necessary to animate government policy & public demand for proper treatment
- ❖ Medical treatment trend beyond the national boundary (e.g., people from Europe, US, and South Asia visit India for treatment) should also be considered and economic analysis should be done

***Thank you very much for your
kind attention***

&

Now it is Time for discussion!