



PROJECT CASE STUDY

6 April 2011

HEADLINE HERE

Country Participation	Argentina, India, Latvia, Lebanon, Philippines, Senegal, Tanzania and Viet Nam
Region	Global
Key Result Area	Reduction and Elimination of Persistent Organic Pollutants (POPs)
Project ID	2596 - Demonstrating and Promoting Best Techniques and Practices for Reducing Healthcare Waste to Avoid Environmental Releases of Dioxins and Mercury
Project Activity Dates	<i>Start:</i> August 2008 <i>End:</i> August 2012

ABSTRACT

Particularly in developing countries, the generation of healthcare waste is rapidly increasing as a result of expanding healthcare systems, increased utilization of single-use items, and poor segregation practices. To reduce the spread of HIV/AIDS and other communicable diseases (such as Hepatitis B and C) from infectious waste, many developing countries heavily rely on poorly or uncontrolled incineration and even open burning.

As a result of the poorly controlled incineration or the open burning of healthcare waste, the healthcare sector is a major source of dioxins in many countries. Additionally, breakage and improper disposal of mercury-containing healthcare devices, such as thermometers and sphygmomanometers, result in significant emissions of mercury. Harmful contaminants like dioxins and mercury are transported globally on air currents and by other means; they are toxic in small quantities; they bio-accumulate up the food chain; and they have caused documented harm to public health and the environment in locations far from the original source of their release.

The Stockholm Convention on Persistent Organic Pollutants (POPs) requires countries that are parties to the Convention to give priority consideration to waste treatment processes, techniques and practices that avoid the unintentional formation and release of POPs, such as dioxins. However, many countries lack the ability or resources to comply with these obligations.

This project is assisting seven countries - Argentina, India, Latvia, Lebanon, Philippines, Senegal and Vietnam - in developing and sustaining best healthcare waste management practices in a way that is both locally appropriate and globally replicable. An additional project component in Tanzania will develop, test and disseminate affordable and effective alternative healthcare waste treatment technologies appropriate to conditions in much of sub-Saharan Africa. The project's ultimate goal is to protect public health and the global environment from the impacts of dioxin and mercury releases.

In each participating country, this project is creating model healthcare facilities or programs through collaborations with hospitals, smaller clinics, rural health and/or central waste treatment facilities. The project focuses primarily on activities such as waste minimization, promoting the use of non-burn waste treatment technologies, improved waste segregation practices and the use of appropriate alternatives to mercury-containing devices.

If replicated nationally and sustained, best practices and techniques initiated during the project's implementation are expected to reduce the release of an estimated 187 g TEQ (toxic equivalency) of dioxins and 2,910 kg of mercury to the environment each year from participating countries' healthcare sectors.

BRIEF DESCRIPTION OF ISSUES

Incineration and open burning of healthcare waste

As health systems are strengthened and healthcare coverage expands in developing countries, an increasing amount of waste is generated - and the releases of POPs and other toxic substances to the environment can increase substantially. This is often an unintended consequence of choices in materials and processes that seek to improve health outcomes.

Incineration and open burning of healthcare waste are the main sources of dioxins in healthcare, and are major sources of mercury pollution. However, incineration and improperly handled mercury spills are not the only problems with medical waste treatment. Some urban and many rural hospitals and clinics in the developing world discard their medical waste with regular trash, which risks the spread of diseases especially among waste handlers, recyclers, and communities living near dump sites. Discarded needles and syringes, for instance, may result in the spread of blood-borne pathogens such as HIV/AIDS and hepatitis.

As health programs expand around the world, safer systems of medical waste treatment and disposal must also expand in order to prevent harming the very populations these programs are intending to serve.

BRIEF DESCRIPTION OF PROJECT

Major Goals



The Global Environment Facility (GEF) is providing funding to this jointly implemented United Nations Development Programme (UNDP)/World Health Organization (WHO)/Health Care Without Harm (HCWH) project to demonstrate the effectiveness of improved healthcare waste management practices and technologies in order for other Stockholm Convention signatory countries to use these models as they set their own national healthcare waste management priorities.

The major goals of this project are to achieve:

1. Establishment of model healthcare facilities to exemplify best practices in healthcare waste management.
2. Deployment and evaluation of non-incineration healthcare waste treatment technologies appropriate to needs.
3. Development, testing, manufacture and deployment of small and medium sized non-incineration healthcare waste treatment technologies appropriate and affordable for use in sub-Saharan Africa.
4. Introduction of mercury-free devices in model facilities, evaluation of their acceptability and efficacy, and development and dissemination of awareness-raising materials.
5. Establishment or enhancement of training programs to build capacity for implementation of best practices and appropriate technologies beyond the model facilities.
6. Review of relevant policies and seeking of agreement by relevant authorities on recommended updates or reformulations if needed.
7. Regional and global dissemination of project results.

1. Establishment of model healthcare facilities to exemplify best practices in healthcare waste management (HCWM)

In each participating country, the project creates model healthcare facilities through collaborations with hospitals, clusters of hospitals, smaller clinics or rural health facilities, focusing primarily on activities such as waste minimization, promoting the use of non-burn waste treatment technologies, improved waste segregation practices and the use of appropriate alternatives to mercury-containing devices. In some of the participating countries national governments have been promoting a network of Central Treatment Facilities (CTF) that serve a cluster of healthcare facilities with treatment and disposal option for healthcare waste. In those countries, the project helps to create model CTFs, evaluating current practices, recommending improvements to systems design and their operation, improve practices to increase waste segregation, reduce waste volumes and ensure compliance with existing laws.

At the start of the project, the selected facilities practiced little or no segregation, nor did they have waste minimization practices or policies promulgating best practices in place, while few or no personnel underwent training on HCWM.

Since the launch of the project, Memoranda of Understanding were formalized with selected model facilities, and a set of guidance documents and tools were developed to undertake facility baseline assessments and to help healthcare facilities adopt best practices and techniques for HCWM. Among the guidance materials and tools are (for a full list please visit the project's website www.gefmedwaste.org):

- **Individualized Rapid Assessment Tool (I-RAT)** to rapidly assess HCWM in a healthcare facility and to prioritize interventions
- **Recommended Elements of a Model Facility Policy on HCWM** to define the HCWM responsibilities of the healthcare institution, management and its staff.
- **Guidance on Conducting a Baseline Assessment of a Healthcare Facility** to establish initial measures in order to quantify improvements in waste reduction, training, inventory control, segregation, collection, storage, and treatment as well as worker safety, mercury use and cost savings.
- **Guidance on Estimating Baseline Dioxin Releases** to estimate releases of dioxins and other POPs from healthcare facilities
- **Notes on Selecting Mercury Reduction Activities** to assist facilities in prioritizing mercury reduction activities based on overall environmental impact, energy use, cost and other factors
- **Core Competencies Related to Healthcare Waste Management** to define standards as the basis for training curricula, professional development, and accreditation
- **Cleanup, Storage, and Transport of Mercury Waste from Healthcare Facilities** intended for project countries where national norms and guidelines for cleanup, storage, and transport of mercury waste do not yet exist.

Component highlight - Lebanon: The I-RAT was adapted to local circumstances and baseline assessments were completed for the two selected model facilities, one of which started immediately with the implementation of best practices, as I-RAT results managed to build

awareness among hospital staff and management. The I-RAT is currently being conducted in 136 hospitals (government as well as private) nationwide and will allow for a HCWM ranking among hospitals. Around 36 hospitals were assessed so far. 31 of the field investigators are students majoring in environmental science at the Lebanese University who have been trained by the project team to conduct the rapid assessment.

Component highlight – Argentina: At the Garrahan Pediatric Hospital, a healthcare waste management committee developed a waste management plan to reduce waste, improve recycling, phase out mercury, and enhance hospital hygiene. They are now reducing their infectious waste generation by 30 percent as a result of better classification and segregation. An average of 511 thermometers a month was broken before 2009 but now 80 to 85 percent of their thermometers and sphygmomanometers are mercury-free as part of their phase-out plan. The model hospital is improving its waste collection and implementing a bar code system to track and monitor their waste.

2. Deployment of non-incineration technologies to meet facilities' needs

At the time the Project entered into the GEF pipeline, some of the model facilities¹, clusters or programs selected to become models either did not have treatment systems in place or they operated incinerators that did not meet international standards.

For each of these facilities the following activities will be undertaken:

- Non-incineration, facility specific, technology specifications developed.
- Appropriate technology reviewed, selected, and purchased.
- Technology site prepared and permits obtained.
- Technology installed and commissioned.
- Operator/maintenance training conducted.
- Technology monitored, tested and evaluated.
- Accreditation by national body (if applicable) facilitated.

Component highlight - India: Following recommendations and specifications developed by the project team, the model Central Treatment Facility in Tamil Nadu has installed a quench system and wet scrubber to an existing incinerator to reduce emission of dioxins and furans. The project is also in the process of improving the existing autoclave systems to increase the ratio of waste autoclaved versus incinerated and will add shredders to the autoclaves to reduce the volume of treated waste disposed of in a landfill. In Uttar Pradesh, the lay-out of the technology site has been finalized and the project is in the process of evaluating three bids for the non-incineration (autoclave/shredder) technology.

Component highlight - Latvia: “Microbiological inactivation tests were conducted for the “TEMPICO Rotoclave” (“Lautus” Ltd - model central treatment facility). Optimized operating parameters and procedures as well as microbiological testing protocols have been developed for the CTF, and test results showing high level disinfection of waste were presented to the company management. A 2nd round of microbiological inactivation tests was carried out on a technology installed at a model healthcare facility (Medister – microwave at Ventspils) also showed good results.

Component highlight – Lebanon: The model central treatment facility (“Arcenciel”) is successfully using two hybrid steam treatment systems with internal shredder (Ecodas technology) or rotating fragmenting arm (Hydroclave technologies) to treat 5 tonnes of infectious waste per day from hospitals around the country. The project is assisting the facility on microbial inactivation testing and other areas.

Component Highlight - Tanzania: A baseline assessment was completed for Bagamoyo district hospital and an entirely new HCWM system has been set-up since (including bins/bags/procedures/monitoring and evaluation). Before the new HCWM system 62% of waste was classified as infectious, however as a result of good segregation practices only 25% is currently treated as infectious waste, a major improvement even though further improvement is ongoing. Since the shift from an old incinerator to the autoclave-shredder system in Oct. 2008, an estimated 3.8 g I-TEQ of dioxans and furans have been eliminated. Continuous monitoring and documentation of the operation and daily functioning of the enhanced waste management system and alternative treatment technologies is ongoing to provide feedback for continuous improvement.

3. Development of non-incineration technologies to meet African needs

¹ Project countries that have central treatment facilities (CTF) in place are not installing on site technologies at model facilities but are working with the CTFs to improve technology on site.

Proper treatment and disinfection of healthcare waste is a high priority concern for most sub-Saharan African countries, in response to the high incidence of HIV, Hepatitis and other infectious diseases that can be spread by infectious wastes. The main approach now promoted by health experts and others for most healthcare facilities in sub-Saharan Africa is to encourage treatment of infectious wastes by combustion in small, locally-built incinerators lacking effective pollution controls, and in many cases, to treat healthcare waste by open burning or barrel burning or mixing it with regular municipal waste.

Effective and affordable non-incineration technologies for healthcare waste treatment tailored to the African context are simply not available, in particular technologies that can operate in locales where electricity and other utility services are unreliable or unavailable. No local manufacturers of alternative treatment technologies currently exist in Africa.

Therefore, as part of this project locally-produced, affordable, non-burn healthcare waste treatment technologies will be developed in Tanzania through a collaboration with the University of Dar-es-Salaam's College of Engineering and Technology.

Component highlight: In order to guide the design of new technologies, NGO project partner AGENDA has undertaken a needs assessment for hospitals in African countries in relation to infectious waste treatment which also surveyed the number, types and sizes of healthcare facilities in Africa. Representatives from the Technology Development Coordinating Team (TDCT) visited non-incineration manufacturers in India to get acquainted with existing technologies and prices of medical waste disposal equipment.

Component highlight: Designs for the non-incineration HCW treatment technologies (autoclave, shredder, compactor) to meet African needs have been finalized and approved by an international committee of 25 expert advisors. Material specifications have been agreed upon and the building of prototypes is underway.

4. Facilitating replacement of mercury-containing devices by mercury-free alternatives

Mercury is widely used in healthcare practice in thermometers, blood pressure measurement instruments (sphygmomanometers) and other devices. Substantial releases of mercury contained in such devices enter the environment as a result of breakages, spills and improper disposal.

While the use of mercury containing healthcare devices is rapidly declining in most highly industrial countries, it is generally on the rise in the developing world. This is a result of healthcare system coverage expansion, unfamiliarity with mercury-free alternatives on the part of healthcare professionals, because some manufacturers of these devices are redirecting their marketing to health institutions in developing countries, and last but not least because some healthcare institutions in industrialized countries retire their old mercury-containing instruments by donating them to healthcare institutions in developing countries.

As part of this project, activities are intended to reduce the healthcare sector's contribution to mercury pollution by helping to integrate the use of mercury-free devices and improving mercury spill management systems in model hospitals within each project country. Based on the guidance materials developed under the project, model facilities will receive support in the development of instructions and guidelines on mercury management and specifications for mercury free tender procedures. Initiation of equipment procurement, including mercury-free alternatives, has already started in a number of facilities.

Component highlight: In collaboration with project partners WHO and the NGO HealthCare Without Harm (HCWH), the project has developed guidelines for the clean-up, storage and transport of mercury waste from healthcare facilities to facilitate the phase-out of mercury devices in countries where national guidelines are not yet in place or fully implemented.

Component highlight: WHO/HCWH and UNDP are also undertaking needs assessment and awareness raising activities at all project model facilities, as well as at national and regional level, to create momentum for the phase-out of mercury containing devices. As part of these activities a narrated slide presentation on "Mercury - Its Properties, Sources, and Health Effects" has been developed.

Component highlight India/Lebanon: During awareness raising activities related to mercury containing devices an important observation has been that among healthcare professionals in these countries, there is resistance to mercury-free devices because they are perceived to be less accurate. To address the concerns of healthcare professionals, the project will undertake a comparative evaluation of non-mercury thermometers and healthcare staff preferences, in order to

- i) Determine the suitability of use of electronic and digital thermometers in a hospital setting based on real and perceived differences in their essential characteristics;
- ii) Assess the preferences of healthcare professional staff when presented with the attributes of each alternative and to understand the basis for their choices.

The result of this evaluation will help understand the basis for the choices made by healthcare professionals and will inform the process of mercury phase-out planning in project countries.

5. Establishment or enhancement of training programs

Many countries have inadequate or no training programs at the local and national levels which is an important foundation for institutionalizing and sustaining best techniques and practices for healthcare waste management (HCWM). For this reason the project aims to establish or enhance training programs to build capacity for implementation of best practices and appropriate technologies beyond the model facilities and programs.

In collaboration with project partner the School of Public Health of the University of Illinois at Chicago (UIC), the project has developed a “Gold Standard” curriculum for training healthcare waste management coordinators and master trainers based on a compilation of existing training materials from around the world, such as the updated WHO reference document, core competencies, and effective teaching methods used by UIC. The curriculum will be tailored to national circumstances in the project countries based on a review of national training programmes.

In the project countries agreements have been initiated between the project and national training and teaching institutions, and baseline assessments of university and practical training programmes are either on-going or have been finalized.

Component highlight - India: Programme Study Centres (PSC) are in the process of being established at Lucknow (Uttar Pradesh) and Chennai (Tamil Nadu) through a partnership with the Indira Gandhi National Open University (IGNOU)’s School of Health Sciences. The first exams for the training-of-trainers programmes was conducted in October 2010.

Component highlight – Latvia: A lecture on health care waste management has already been included in the Environmental Science study programme of Riga Technical University.

Component highlight – Lebanon: There are several existing training programs in the country offered by WHO-Lebanon, Arcenciel (model central treatment facility), major hospitals, universities, and the syndicate of private hospitals. On August 2010, the project brought together representatives of six training programs to share their curricula, training techniques, and delivery methods. They are working with the global project’s training team at the University of Illinois at Chicago to enhance the training programs which are being conducted in Arabic, French, English, and Bengali.

6. Review of policies pertaining to HCWM

In many developing countries the foundations for institutionalizing and sustaining best techniques and practices for healthcare waste management (HCWM) are often weak or nonexistent as Healthcare Waste Management policies, guidelines and implementation plans are often ineffective or may not exist, which:

- i) Increases risks to patients, health workers and communities from healthcare waste (HCW).
- ii) Exposes the global environment and public health to threats from POPs and Persistent Toxic Substances (PTS) pollution.
- iii) Leads to poor HCWM systems which in turn lead to poorly functioning health-delivery systems.

Therefore it is important that national policies tailored to national circumstances and conditions are developed and implemented. With respect to changing and improving national policies pertaining to HCWM, this project seeks to:

- Review relevant national policies, regulations and guidelines in light of project experiences.
- Recommend appropriate policy updates or revisions and pursue agreement and commitments by relevant authorities.
- Organize national policy review platforms for relevant authorities.

Component highlight – Lebanon: A review of decree 13389, which classifies healthcare waste and specifies their ways of disposal, was conducted and gaps were identified. The project team recommended improvements concerning i) transportation ii) establishment and operation of CTFs, iii) reporting, iv) mercury phase-out and selection of alternatives, and v) guidelines for mercury cleanup and storage. The project team will explore the possibility of involving MoE in the licensing and accreditation of healthcare facilities and in addition, will work on a ministerial degree regarding HCW transportation, operation of HCWTFs and mercury phase-out (clean-up/storage).

Component highlight – Senegal: Project partner PRONALIN, with the support of the Central Treatment Facility, developed a National

Action Plan for HCWM and succeeded in getting Presidential Decree 2008-1007 (regulating HCWM) approved in 2008. In 2009, national commissions on Nosocomial Infections were formed and many committees at the hospital level have been instituted since, one of their responsibilities being HCWM.

7. National, regional and global dissemination of project results

The methods used during the project will be replicable in other projects and other areas. The project will foster local and national “champions” to ensure the sustainability and replicability of project achievements long after the project’s official completion.

The project is not an investment project to reduce nationwide releases of POPs, but rather is intended to demonstrate barrier-reduction leading to replication of best environmental practices and technologies in facilities nationwide. While facility-level implementation will result in reductions of dioxins and furans at the local level, the widespread replication and sustainability of these practices and techniques, through barrier-reduction strategies such as national training programs and information dissemination, have the potential of producing even greater decreases in dioxin and furan releases nationwide.

At national level dissemination of project results takes place through public awareness campaigns and national project websites, coverage through news and internet articles, as well as regional and national workshops.

For a complete list of the awareness raising and educational materials, developed under this project, visit the project's (“document archives”) website (www.gefmedwaste.org).

Project related materials are also being disseminated by the University of Illinois at Chicago through its website GeoLibrary: www.geolib.org and by NGO partner Health Care Without Harm (HCWH) through its website: www.noharm.org.

Lessons-learned and experiences from the project were used by global project team members to inform the:

- Revision of the WHO main reference document "*Safe Management of wastes from healthcare activities*".
- "Pharmaceuticals and the Environment" (US/EPA-funded project to investigate treatment technologies for pharmaceutical waste)
- Meetings of State and Territorial Association for Alternative Treatment Technologies (STAATT), a group that sets international guidelines on microbial inactivation efficacy of medical waste treatment technologies.
- "Mercury Replacement in Healthcare: Thermometers and Sphygmomanometers," Technical Guidance, World Health Organization, Geneva, Switzerland, to be released in 2011
- "Toward the Tipping Point: WHO-HCWH Global Initiative to Substitute Mercury-Based Medical Devices in Health Care," Two-Year Progress Report, June 2, 2010
- "Workshop on Costing of Health Care Waste Management," Pan American Health Organization (PAHO), Tegucigalpa, Honduras, October 22, 2010.
- "International Meeting on Health-Care Waste," World Health Organization, Geneva, Switzerland, June 20-22, 2007
- "WHO core principles for achieving safe and sustainable management of health-care waste," World Health Organization, Geneva, Switzerland, October 2007

Component highlight – Asia: An “Asia Regional Conference on Mercury-Free Health Care” was jointly organized by WHO, HCWH, KEMI (Swedish Chemicals Agency), and the UNDP GEF project on March 15, 2011. The conference was attended by over 100 representatives of Health and Environment Ministries, hospitals, health organizations, and health professionals from China, India, Indonesia, Mongolia, Nepal, Philippines, Saudi Arabia, South Korea, Thailand, and Vietnam, as well as South Africa and United States. Technical and policy issues regarding the phase-out of mercury thermometers and sphygmomanometers, storage of mercury waste from hospitals, and the accuracy of non-mercury devices were discussed and a Manila 2011 conference declaration was issued.

Successful Practice	
Key Successes	<i>India:</i> In Uttar Pradesh the project supports a very large model hospital (> 3000 beds). During the start of project activities (as is the standardized approach for all the project's model facilities) a baseline assessment was undertaken. The assessment, which intended to identify major issues with respect to HCWM in each of the departments, was conducted particularly well thanks to "nodal officers" appointed in each department to support the baseline assessment.
What Factors Supported Success	The nodal officers were trained by the project's Central Treatment Facility and have shown incredible commitment and have been key players in identifying major HCWM related challenges in each of the departments.
Relevant Information	6 departments have been selected in which best practices will be demonstrated. Then these practices will be replicated across the entire hospital.

Successful Practice	
Key Successes	<i>Lebanon:</i> The I-RAT was adapted to local circumstances and baseline assessments were completed for the two model facilities. Hammoud hospital immediately started with implementation of best practices after completion of the I-RAT; assessment results managed to build a lot of awareness among hospital staff and management. Currently, the I-RAT is being conducted in 160 hospitals nationwide (government as well as private) and so far around 36 hospitals have been assessed. Among the field investigators are 31 students majoring in environmental science at the Lebanese University who have been trained by the project team to conduct the rapid assessment.
What Factors Supported Success	1) Adaption of the I-RAT to local circumstances; 2) As a result of its participatory approach and proposing improvements throughout the rapid assessment, the I-RAT's process has shown to create a lot of awareness among hospital staff and management in the project countries. As a result, hospitals often start improving their HCWM systems on their own initiative immediately after completion of the I-RAT; 3) Project involvement of the National Lebanese University has resulted in the participation of 31 field investigators, students majoring in environmental science, who have been trained by the project team to conduct rapid assessments.
Relevant Information	The nationwide assessment of hospitals will allow for a HCWM ranking among hospitals.

Successful Practice	
Key Successes	<i>Tanzania:</i> An entirely new HCWM system (including bins/bags/procedures/monitoring and evaluation) has been set-up at Bagamoyo District Hospital. Before the new HCWM system, 62% of waste was classified as infectious, but as a result of good segregation practices only 25% is currently treated as infectious waste. Since the installation and operationalization of a non-incineration technology (autoclave) in 2008, the project estimates that 3.8 g-TEQ/yr of dioxins and furans are being avoided yearly (see also the technical brief on gefmedwaste.org "Testing a Waste Treatment Autoclave at a Hospital in Tanzania").
What Factors Supported Success	1) A baseline assessment 2) The shift from an old incinerator to the autoclave-shredder system in Oct. 2008 3) Continuous monitoring and documentation of the operation and daily functioning of the enhanced waste management system and alternative treatment technologies to provide feedback for continuous improvement.
Relevant Information	After the results were presented to Tanzania's Chief Medical Officer, the Ministry of Health expressed interest in expanding the system to all district hospitals in the country.

Successful Practice

<p>Key Successes</p>	<p>Some of the project's achievements to date with respect to policy review and change in project countries include:</p> <p><i>Latvia:</i> In 2009, the project team and the Ministry of Environment developed a report with recommendations for policy amendments pertaining to waste classification, practical guidelines, provisions for veterinary- and pharmaceutical waste as well as training requirements. The report proposed improvements to existing legislation and proposed new legislations for areas where none existed previously. The report was updated (Feb. 2010) and supplemented with a technical-economic analysis of the processes likely to follow policy changes. The report was reviewed at an inter-ministerial meeting and priorities identified in the report as significant for incorporation into the new waste management law were discussed.</p> <p><i>Senegal:</i> Project partner PRONALIN, with the support of the CTF, developed a National Actions Plan for HCWM and succeeded in getting Presidential Decree 2008-1007 (regulating HCWM) approved in 2008.</p> <p><i>Philippines:</i> Project partners in the Philippines assisted the Department of Health (DoH) in the development of Administrative Order 21 (AO 21) on the gradual phase-out of mercury thermometers in all hospitals by 2010.</p>
<p>What Factors Supported Success</p>	<p><i>Latvia:</i> The followed process has encouraged health- and environment inspectorates to work more closely together and has helped clarify overlapping responsibilities. The process also clarified waste classifications for Healthcare facilities (previously lacking). The establishment of policy working group, consisting of stakeholders and government officials, made the policy and regulatory review very successful.</p> <p><i>Senegal:</i> In 2009, national commissions on Nosocomial Infections were formed and many committees at hospital level have been instituted, one of their responsibilities being HCWM.</p> <p><i>Philippines:</i> NGO Health Care Without Harm worked closely with the Philippine Department of Health to provide policy and technical support leading to the administrative order to phase out mercury in hospitals.</p>
<p>Relevant Information</p>	<p>In many developing countries the foundations for institutionalizing and sustaining best techniques and practices for healthcare waste management (HCWM) are often weak or nonexistent, HCWM policies, guidelines and implementation plans are often ineffective or may not exist. A lack or ineffectiveness of policies on HCWM i) Increases risks to patients, health workers and communities from healthcare waste (HCW) ii) Exposes the global environment and public health to threats from POPs and PTS pollution and iii) Leads to poor HCWM systems which in turn lead to poorly functioning health-delivery systems. Therefore it is important that national policies are developed and implemented.</p>

Successful Practice

Key Successes	<p><i>Latvia:</i> Guidelines on "Selection of Equipment for Use in Participating Hospitals or Clinics" and on "Cleanup Storage and Transport of Mercury from Health Care" developed by the global project team have been used for the development of instructions on mercury management in the project's model facilities. In coordination with hospitals' procurement departments and heads nurses, specifications of mercury free tender procedures have been developed and equipment procurement, including mercury-free alternatives, has started. Discussions on the development of guidelines for tariff calculation of mercury containing wastes were initiated with "Lautus" Ltd (one of the Central Treatment Facilities involved in the project) and mercury containing waste (thermometers) from the Ventspils hospital is already being sent to "Lautus" Ltd for treatment.</p> <p>Collection of data on waste flow, environmental loads, costs, lifespan, etc. was completed and the cost-benefit analysis has been performed end of 2010. Agreements with Ministries and the University of Latvia to undertake awareness raising regarding accuracy and reliability of non-mercury thermometers and blood-pressure meters are being finalized.</p>
What Factors Supported Success	<p>1) Adaption to local circumstances, dissemination and application of the "Guidelines on Selection of Equipment for Use in Participating Hospitals or Clinics" and the "Guidelines on Cleanup Storage and Transport of Mercury from Health Care" developed by the global project team; 2) In all project model facilities that participate in a demonstration of mercury waste management and promotion of mercury-free devices, needs assessments and awareness raising are carried out as a first step. An important lessons-learned is that among health-care professionals there exists a certain resistance against mercury-free devices as these are perceived to be less accurate. Therefore, the project has decided to undertake in Lebanon a "Comparative Evaluation of Non-Mercury Thermometers and Healthcare Staff Preferences" of which the results will contribute to overcoming such challenges in each of the project countries.</p>
Relevant Information	<p>In addition to mercury containing medical devices, the assessment also took into consideration the number of mercury bulbs (energy savers) used in the hospitals.</p>

Successful Practice

Key Successes	<p><i>India:</i> The Indira Gandhi National Open University (IGNOU) has been identified as project partner for implementation of national training component of the project and a Memorandum of Understanding was signed between IGNOU and the ministry of environment and Forests in Dec 2009. Programme Study Centres (PSC) are in the process of being established at Lucknow (UP) and Chennai (TN) for the training of trainers programmes for which new modules have been developed by the project (see "Gold Standard Curriculum", explained below).</p>
What Factors Supported Success	<p><i>Global:</i> A "gold standard" curriculum for training healthcare waste management coordinators and master trainers was developed based on a compilation of existing training materials from around the world, the WHO Bluebook for HCWM and its revision, Core Competencies Related to HCWM (2009, UNDP GEF Project), as well as effective teaching methods used by the School of Public Health (a project partner) of the University of Illinois at Chicago (UIC). The comprehensive curriculum has been reviewed by WHO, HCWH, and international experts. Draft slides and other teaching materials are in the process of being developed.</p>
Relevant Information	<p>The first test at IGNOU was given in October 2010</p>

LESSONS LEARNED

- The establishment and regular meetings of policy working group, consisting of stakeholders and government officials, contribute to successful policy and regulatory review.
- In many participating project countries, improved coordination is necessary between and within ministries of Health and Environment (as well as with other Ministries dealing with waste and pollution) and clarifications of jurisdictions and responsibilities pertaining to HCWM issues are needed. For example, it is not uncommon that two Ministries are working in parallel on the development of national plans, strategies or regulations pertaining to healthcare waste.
- In certain countries there are no overall national HCWM plans in place, which in certain situations (often combined with a lack of technical capacity within ministries) results in the implementation of haphazard regulations of which the implications are not well thought through. For example, in the absence of a national HCWM plan, no national budget or strategies are available to implement these new regulations and make them work or regulations lack certain key provisions, generally resulting in inadequate country coverage and making it very hard for parties to adhere to. Therefore, technical capacity within Government institutions dealing with healthcare waste issues needs to be further developed, while each and every country should develop, regularly update, and put in place a national HCWM plan and strategy.
- Ministerial decisions take time because of certain procedures require to be followed. The project helped advance ministerial decision taking not only by supporting the wording of decisions, but also its rationale and the preparation of necessary paperwork.
- Through its participatory approach and proposing improvements throughout the rapid assessment, the I-RAT's process has shown to create a lot of awareness among hospital staff and management in the project countries. As a result, hospitals often start improving their HCWM systems on their own initiative immediately after completion of the I-RAT.
- Because of the high quantity of municipal waste often generated in pilot facilities, it is worthwhile to review the entire waste stream rather than just the medical waste streams.
- Many countries are struggling in their efforts to move away from incineration technologies because of a lack of understanding and capacity to budget for a transition to such technologies. Therefore, PAHO (Regional WHO in Latin-America) has proposed "*Guidance on Selecting Equipment for Use in Participating Hospitals or Clinics (How to best budget and to understand what the costs are for non-incineration technologies)*" for regional workshops.
- It was observed that among healthcare professionals there exists high resistance against mercury-free devices as these devices are perceived to be less accurate. Therefore a "*Comparative Evaluation of Non-Mercury Thermometers and Healthcare Staff Preferences*" will contribute to overcoming such challenges. The result of this evaluation will also help understand the basis for the choices made by healthcare professionals and could inform the process of mercury phase-out planning in project countries.
- Preferably, Central Treatment Facilities (CTFs) which provide services to model facilities should be part of the project. If the CTF is not a project partner, terminal treatment and disposal of the waste generated at a model facility can still be an issue even if model facilities achieve a satisfactory level of healthcare waste management due to project intervention.
- The signing of Memoranda of Understanding (MoUs) between the project and project partners (which includes clauses with respect to the responsibilities of the model facility to document the process, costs and results, submit quarterly progress reports, review awareness materials for publication and provide any data requested by the global expert team) helps to establish the responsibilities of each project partner and had been considered a good practice in many countries. However, on the other hand in the case of certain countries the signing of these MoUs progresses too slowly and jeopardizes the start of project implementation.

Cover Photo: 1. Senegal – Open Dump 2. Jorge Emmanuel (Bagamoyo District Hospital, Tanzania, 2008), 4. Jorge Emmanuel (Latvia, 2008), 6. Joshua Karliner, HCWH

Contact Information: Jacques van Engel, Senior Programme Specialist, Montreal Protocol Unit/ Chemicals, jacques.vanengel@undp.org