

Report

Workshop on 'Mercury Phase Out In Health Care Sector'

March, 24 -2011,
Lucknow, Uttar Pradesh



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1. Workshop Background

Mercury emissions into the environment are transported regionally and globally in the atmosphere and its compounds have numerous and well-documented adverse effects on human and animal health. Most frighteningly, it can cross the placental barrier and enter the foetus, lowering IQs and damaging nervous systems. Pregnant women, children, nurses, industrial workers, dental assistants, students using mercury in school labs, as well as those of us using dental mercury fillings are at high risk.

Toxics Link has been involved in these issues for many years now and experience has shown that knowledge-sharing and information dissemination between the stakeholders in a regular and pro-active manner would result in the successful implementation and practice of waste management. In the above context, Toxics Link has been holding workshops and conferences on mercury phase out in health care sector to promote awareness and share knowledge on the above themes in different regions of the country.

As a part of the dissemination of information, Toxics Link in partnership with Indira Gandhi National Open University (IGNOU) and Chhatrapati Shahuji Maharaj Medical University (CSMMU), Lucknow, Uttar Pradesh organized a workshop on “Mercury Phase Out in Health Care Sector” on March 24th, 2011 in Lucknow, Uttar Pradesh that was supported by the UNDP/Global Environment Facility (GEF). The event was attended by a remarkable gathering from various departments. The participants of the workshop include the representatives of Pollution Control Boards, Uttar Pradesh Health System Project, Doctors, Health Care Professionals, Educational and Research Institutes and Civil Societies. The overall objective of the workshop was to sensitize the issue of mercury in health care sector in the region by providing a platform to all the stakeholders for a healthy discussion, knowledge and experiences sharing. The workshop led the major emphasis on the following key areas:

1. Mercury Toxicity in health care sector
2. Occupational health hazard of Mercury
3. Role and responsibilities of important stakeholders
4. Mercury phase out plan and challenges
5. Mercury policy and global initiative

2. Inaugural Session:

The inaugural session started with the welcome address given by **Mr. Satish Sinha** (Associate Director, Toxics Link). In his address, Mr. Sinha briefed about Toxics Link and its campaign for mercury phase out in health care sector. He explained that the objective is to sensitize and bring awareness about Mercury in healthcare establishments. Mercury perhaps being used in so many spheres of life and many products and process but why do we need to look at it from healthcare establishments. Mercury is highly toxic. In healthcare establishments we use mercury majorly in thermometers and sphygmomanometers. It is perhaps the easiest way to change. Global initiatives in many countries are to look at buying instrument to phase out mercury, remove mercury in all the usage of process. He further told that in India we have done many steps in removing some of the products in which mercury has been traditionally used. In the production of caustic soda or chlor alkali plants we use mercury. This is a change, which has happened in last 5-6 years. Almost 90% of the mercury that we were using in the chlor alkali plants has now being totally shifted to cell membrane technology. As a nation we can say that we are in that process but there are other processes in which mercury is being used such as health care sector, CFL and it is needed to remove mercury from its current usage. In the healthcare sector too we have taken many steps in the country. There are many places from where instruments of mercury are been totally removed from the healthcare facilities. There are some barriers in shifting mercury to non-mercury equipments.

Prof. J.V. Singh, (Vice Chancellor, CSMMU) in his Keynote Speech said that when this programme of phasing out of mercury was initiated we first identified urology department, which is now not using any equipment with mercury. Now, we are trying this to other departments like medicines, cardiology to come forward and take the other options of equipments available in the market. We have already given orders to purchase equipments, which are non-mercury. By the end of this year we will be with the non-mercury equipments in our hospital.

Prof. A.K. Agarwal of School of Health and Science (SOHS), IGNOU, congratulated and welcomed to all the participants from the medical fraternity to come forward and participate the sessions.

He shared that IGNOU is running a 6 monthly certificate programme in health care waste management. As a part of this project they have updated more lessons/units on the mercury hazards, treatment facilities and on the patient's safety. About mercury he said that it is very serious and hazardous in nature. It is bio-accumulative in nature that means it is a process by which toxics mercury accumulates in animal tissues. It is very important to phase-out mercury. Studies have shown that most common way that human beings are exposed to mercury is by eating fish containing methyl mercury in which other exposures also result to it. It does not mean that if you are a vegetarian you are not exposed to mercury. Other exposures may be by breaking instruments containing mercury that is thermometer, sphygmomanometer and other as well as dental amalgam. These are the most common sources of mercury. But methyl mercury from fish has an absorption rate of 95% from which we can assume serious proportion. Suppose in one scene a thermometer breaks in our mouth and we ingest it in our mouth and it goes in our stomach and intestine and in another scene a mercury thermometer or sphygmomanometer breaks in the floor in a closed room, in that case the other option is more harmful. He further explained that there is very low absorption of elemental mercury than methyl mercury. Once mercury is absorbed then it enters the blood and the placenta. Over time it is accumulated and it converts in organic mercury. The hemoglobin reduces and then anemia and other diseases attack. Methylmercury is very dangerous as it reaches to our cells without even converting in organic mercury. So, it is necessary to slowly phase out the mercury from our institutions.

Dr. M. Subha Rao (Director, Ministry of Environment and Forest), address and congratulated for the workshop and invited the audiences for a useful knowledge sharing. He said that mercury is a global problem. Mercury is a non-persistent metal. It can travel from one country to another country. It causes havoc in the environment that is why there are so many global efforts to eliminate mercury. Not to allow it to enter in the environment and to eradicate complete use of mercury in day-to-day equipments. Globally GEF is making efforts

to avoid release of mercury in the environment by supporting projects. It is only a small beginning to develop certain modern facilities on how mercury can be avoided or it should be removed from all the hospitals and proper substitutes should be used. We are also taking national steps to eliminate mercury not only in the health sector but also in the other sectors. We are in the process of 100% replacement. Still there are other sectors in which mercury is still in use. Ministry had issued a guideline in which how to dispose of the mercury from the used bulbs, how it should be collected are explained. With the global effort we are trying to initiate in some states to replace mercury equipments from health care sector. The role of GEF in this project is to create awareness among stakeholders by conducting this type of workshops with efforts from Toxics Link and IGNOU. He shared that Central Pollution Control Board also developed some guidelines for storage of mercury and how mercury spills to be taken care. Most of the bulbs are presently going with the municipal waste and contaminating the environment. So, important is how it should be collected from different sources and removed and treated. Now, with the mercury instruments replacement has come and the mercury spills and other wastes should be taken care and sent back to proper recycling units. Mercury phase out process should be taken care in all the health care centers. He urged that now its time for all state government to take initiative in this regard and take proper actions in phasing out mercury in from the health care sectors.

Dr. Mohd. Tariq, (Senior Programme Officer, Toxics Link, New Delhi) gave vote of thanks to the delegates and the participants of the workshop.

3. Technical Session – I

The first technical session was on the theme of “Mercury Issues and Policies” which was chaired by Prof. Ashok K. Agarwal and Mr. Satish Sinha. There were three speakers in the session, namely, Dr. Ragini Kumari (Senior Programme Officer, Toxics Link), Prof. Peter Orris (Expert GEF –UNDP), Dr. Anil Kumar (CMO, NFSG, Directorate General of Health).

Dr. Ragini Kumari started the session by her presentation titled, “Hazards of Mercury, Global and National initiatives for Mercury Phase Out in Health Care”. She explained the various forms of mercury and its circulation in the environment. Further she emphasized upon the problems mercury can give and also why mercury is internationally into the picture. She shared some facts from reports from Toxics Link for example at present about 26 Tons of mercury is trapped in healthcare instruments and annual release of mercury can be about 8 Tons from the spillage of these instruments alone.

She further shared on the issues (cost, lack of mandatory standardization for alternate products, issues related to storage of surplus mercury) of mercury phase-out from the healthcare sector. Dr. Ragini talked about the global movement on mercury in which UNEP, WHO-HCWH etc has taken initiatives and shared examples from across the world who have shifted towards mercury free.

Prof. Peter Orris made a presentation on “Alternatives to Mercury measuring devices in healthcare”.

Prof. Orris talked about various forms of mercury and their impact on the population. Further he has talk about usage of mercury in healthcare instruments and dentistry. Further, he shared data on breakage rate of thermometers and mercury-free alternates available. He explained issues in shift and need for frequent calibration of aneroid sphygmomanometers.

Dr. Anil Kumar (Sr. Chief Medical Officer, Directorate General Health Services, Ministry of Health and Family Welfare) made presentation on “Policy on Mercury Phase out and interventions of MOHFW, GOI”. His focus was on the initiatives taken by the government under National Policy document and Operational Guidelines for CHC, PHC and SC by MOHFW in 2007 for implementation of Infection Management and Environment Plan (IMEP) under RCH ph-II, to address the issues relating to infection control and waste management. He shared that three Self Learning documents in BMW management have been developed for doctors & administrators, nurses & paramedical and group D employees of health care facilities. These documents have included guidelines on Mercury spill management in the health facilities. Inclusion of these guidelines in course curriculum of doctors and nurses is under process. He also talked about guidelines to reduce environmental pollution due to

mercury (March 2010) in which all central government hospitals and health centers are advised to gradually phase out mercury. It is recommended that a mercury phase-out plan to be developed, to start procurement of new equipment which is mercury-free. The storage, handling, treatment and disposal practices should be in line with the requirements of government of India's hazardous waste (management, handling and trans-boundary movement) rules 2008.

On the issue of Management of Mercury waste he showed some of the key points. Such as, Mercury-contaminated waste should not be mixed with other biomedical waste or with general waste. It should not be swept down the drain. It should be disposed off at a hazardous waste facility or given to a mercury-based equipment manufacturer. Not to handle mercury with bare hands and as far as possible. Jewellery should be removed at the time of handling mercury. After handling mercury, hands must be carefully washed before eating or drinking. Appropriate personal protective equipment (rubber gloves, goggles/face shields and clothing) should be worn while handling Hg.

He told that these guidelines are also being included in Indian Public Health Standards for sub-district and district hospitals. Regular trainings are conducted for different levels of health care workers in bio-medical waste including mercury waste management in the hospitals under GOI. NGO sector has been involved for capacity building of health workers. Funds are released to states/UTs under NRHM for BMW as per their annual PIP. Presently, most of the hospitals in Delhi have stopped procuring mercury-containing devices. They are phasing out the old stock of mercury containing devices and replacing them with the non-mercury devices. Delhi Pollution Control committee issued Public notices for minimizing/eliminating the mercury based equipments used in health care facilities and issued letters to individual health care units for the commitment to minimize / eliminate mercury containing waste. A condition has also been imposed in this regard while granting authorization to the health care units.

He also talked about the challenges, mercury pollution prevention programme and possible avenues of cooperation with international partners.

Question answer session-I:

The question answer session saw lot of queries from the medical fraternity.

Questions were raised upon the clinical evidences of mercury toxicity its lethal dose. It was explained by the speakers that lethal doses and concentration of mercury the limits of mercury does needs to be defined clearly. Exposure limit for elemental mercury under the US EPA, OSHA etc were shared. An evidence of impact of mercury on population was shared.

Further, impact of dental amalgam and possible alternates were discussed.

It was also felt that mercury noise has already being started creating the debate on our minds. It needs more data to be gathered and produced. Use of mercury in ayurvedic, homeopathy medicines was discussed. It's mainly due to the preparation process. The preparation is not formulated. Minimal doses in homeopathy are not harmful. In ayurvedic, it's a concern when preparation is not done properly. It was discussed that the globe is also looking that mercury is highly toxic and is taking to all the usage.

After the 1st session a film produced by Toxics Link titled "Mercury-No Silver Lining" was screened to the audience. This film covers important sectors, which uses mercury and those as well where it's unintentionally emitted in the ambient.

4. Technical Session - II

The technical session II was on the theme of "Managing Mercury Waste in Healthcare" which was chaired by Dr. M. Subha Rao, Prof. J. V. Singh. There were four speakers in the session Dr. Yogesh Saxena (Assistant Professor, Dept. of Physiology, HIHT, Dehradun), Prof. Peter Orris (Expert, UNDP), Mr. J. Chandra Babu (Scientist C – HWM CPCB, Delhi) and Dr. V. P. Sharma (Scientist F, Indian Institute of Toxicology Research, Lucknow).

Dr. Yogesh Saxena made a presentation on "Creating Mercury Free Environment at Medical College Hospital: HIHT Case study". He shared the case study of the hospital HIHT. He explained that how the hospital in phasing out mercury planned with a strategy. The approach to mercury phase out from the hospital was in three phases. Phase 1 was during 2004-2006 in which retrospective assessment was done. The Hg purchase and Hg instrument purchase, damage & spills of Hg were done. Training of Hg spillage collection was done. In

this placement of Hg spillage kit, central storage facility (stored as per approved guidelines) was included in the training manual. Search for non-mercurial alternatives were done. In which purchase price, ease of use, accuracy, reliability, and maintenance, accessories cost and after services were done. Phase 2 was during 2006-2009 in which stop use of mercury amalgams at dental clinics and harvesting of used mercury amalgam, collecting mercury equipments & replacing with aneroid in phases, all mercury thermometers replaced by the digitals (clinically robust), drafting and training of standardized procedural manual for measurement of parameters were shared. Phase 3 was during 2009-2011 in which convincing the clinicians, taking feedback from medical technicians/personals at hospitals and researcher, procurement of accessories of aneroid at discounted rates, draft and enforced written policy on mercury, stopped procurement of the mercury equipments and amalgams was introduced. He talked about the yearly cost effectiveness and the achievements of introducing this in phases.

Prof. Peter Orris made a presentation on “Mercury in Dental Sector”. Talking on dental amalgam he said that about 300 tonnes of mercury per annum. Some countries, e.g. Denmark, Norway and Sweden have imposed tight restrictions on dental amalgam. However, most countries still use dental amalgam as alternatives, which are more expensive. Potential alternatives include glass ionomers and composites. He talked about the fever mercury and other types of non-mercury thermometer.

Dr. V. P. Sharma made a presentation on “Healthcare-Applications of Mercury in Biomedical Products & Waste Management”. Talking about the properties of mercury he said that elemental mercury (CAS No. 7439-97-6) is a silver-white, heavy, mobile, liquid metal at room temperature. Further he talks about properties of mercury and various sources (industrial and natural) of it.

Sharing about the management practices he further said that incinerators could vaporize mercury. The incinerators include garbage incinerators, medical-waste incinerators, as well as crematoria. Further, he stressed upon the need for the partnerships with hospitals and clinics to keep medical waste as close to mercury free as far as possible. Stringent

smokestack controls. Efforts to limit mercury in sewage sludge assist in limiting mercury from bio solids incineration.

Mr. J. Chandra Babu made a presentation on “Environmentally Sound Management of Mercury Waste in Health Care Facility”. Mr. Chandra Babu explained about the health effects of mercury. He explained the various forms; exposure pathways and symptoms of acute as well as chronic exposure.

Further, he talk about mercury in various types of healthcare instruments, it's use in thimerosal (mercury based preservatives for vaccines) and laboratory chemicals.

Later, he emphasized upon the mercury containing hazardous waste. Mercury present as a part of the mercury based medical instruments does not fall under the category of hazardous waste. But, when the mercury spillage due to accidental breakage of mercury based medical instruments or any items contaminated with mercury, then it is classified as ‘Hazardous Waste’ as per Scheduled II of the Hazardous Waste (Management and Handling) Rules, 2008. He also talked about mercury spill up kit and mercury spill collection procedure. Explaining about some initiatives taken in Delhi are 48-HCFs, which have moved to digital thermometers/BP instruments. Presently about 36kg of mercury is stored in 09 numbers of hospitals, all the hospitals in Delhi has been directed to dispose of the mercury waste through 02 medical instrument manufacturers located in Delhi, all the HCFs has been directed to switch over to the digital thermometers/BP instruments. He also discussed about the alternatives to the Mercury Base Medical Instruments used in HCFs.

Question Answer Session-II

After the second technical session question and answer with the participants was organised. The questions on the issue of preparation of dental amalgam, mercury phase out process in health care sector were raised. Dr Yogesh shared his HIHT experience in phasing out mercury. He said that it was discussed for initial 2 years make the programme and after that mercury phasing out started. First the phase out was done in the cardio department then it was shifted to medicine department. Procurement process of mercury free instrument was done in which the cost effective issue was there for which international market was explored.

On the issue of dental amalgam and emission from industrial waste issue was raised. Prof Orris replied the dental part of the question. Dental maintenance is directly linked to oral hygiene. The implementation part is very important. Questions were raised on the data or studies available on the mercury emissions from other sectors such as thermal power plants and others. Mercury gets emitted from the burning of fossil fuel by the thermal power plants, initiatives has been taken on behalf of the government to reduce particle adhered mercury through primary treatment like coal washing whereas some amount of mercury can also be captured through the electrostatic precipitators etc to reduce mercury emission in air.

Closing Session

Shri. Y. P. Singh, (Registrar, CSMMU) congratulated for the valuable inputs generated from the workshop. He said that the orientation of amalgamated material is yet to be done. He talked that mercury is injurious for health needs to be deepen in people's mind.

Dr. Keerti Srivastava (Associate Professor, Department of Radiotherapy, CSMMU), congratulated and emphasised on the awareness generation on the issue.

Shri. Satish Sinha gave vote of thanks. He said that huge amount of interest, interaction and the lively discussion was clearly seen during the daylong workshop. The more we engage with the issue the more answers we will get of it. The fact is that mercury is toxic. There is a metal, which is toxic, which tends to be harmful. More research and findings needs to be carried out and we keep learning in this process. It's a fact that lack of data; lack of information in this field is there. There is serious need to invest in sources to invest to gather credible data and it needs to be taken care. Issues on environment are getting focus slowly but the process is very slow. And we do find the new area of research emerging.

The workshop winded up with a great interest and enthusiasm. It comprises of environmentalists, academicians, government representatives, activists, NGO representatives. More than 80 participants were actively involved during the workshop.

AGENDA

09:30 10:00	-	<i>Registration</i>	
10:00 11:00	-	Inaugural Session	
		Welcoming Delegates	Shri Satish Sinha, Associate Director, Toxics Link
		Opening Remarks	Prof. Ashok K Agarwal, School of Health Sciences, IGNOU
		Special Address	Dr. M. Subha Rao Director, MOEF
		Keynote Speech	Prof. J.V. Singh, Vice Chancellor, CSMMU, LKO
		Address by the guest	Prof. Peter Orris, Expert GEF- UNDP
		Thanking delegates and participants	Dr. Mohd. Tariq, Toxics Link, New Delhi
11.00 11.20	-	<i>Tea Break</i>	
11:20 – 1:00		<i>Session I: Mercury Issues and Policies</i> Session Chair - Prof. Ashok K Agarwal and Shri Satish Sinha	
11.20- 11.50		Hazards of Mercury, Global and National initiatives for Mercury Phase Out in health care	Dr. Ragini Kumari, Toxics Link
11.50 -12.20		Alternatives to mercury measuring devices in health care	Prof. Peter Orris, Expert GEF- UNDP
12:20 12:40	-	Policy on Mercury Phase out and interventions of MOHFW, GOI	Dr. Anil Kumar, CMO (NFSG), Directorate General of Health
12:40 12:55	-	Questions/Answers	

12.55 – 1:10	Film: - Mercury – No Silver Lining	Toxics Link, Delhi
1:10– 2:00	<i>Lunch Break</i>	
2:00 – 3:30	Session II: Managing Mercury Waste in Healthcare Session Chair: Dr. M. Subha Rao and Dr. B. P. Sharma, IITR	
2.00 – 2.30	Creating Mercury Free Environment at Medical College Hospital: HIHT Case study	Dr. Yogesh Saxena HIHT, Dehradun
2.30 – 2.50	Mercury in dental sector	<i>Prof. Peter Orris,</i> <i>Expert GEF- UNDP</i>
		Dr. V. P. Sharma Scientist F <i>Indian Institute of Toxicology Research, Lucknow</i>
2.50 - 3.10	Environmentally Sound Management of Mercury Waste In Health Care Facility	Mr. J. Chandra Babu Scientist C – HWM CPCB Delhi
3.10- 3.25	Question/Answer	
3:25 – 3.30	Dr. Y. P. Singh	CSMMU University
	Dr. Keerthi Srivastava	Associate Professor, Department of Radiotherapy, CSMMU, Lucknow
	Shri Satish Sinha	Associate Director, Toxics Link