BEIJING HEALTH CARE SECTOR
MERCURY ELIMINATION PILOT

BRIEFING FOR
China Environment Forum,
Woodrow Wilson Center
May 30, 2007
Background: U.S. Program

Why Mercury & Waste?

- There are approx. 200 source categories of mercury air emission in the U.S.
  - In 1990, Medical Waste Incinerators (MWI’s) were the 3rd largest source.
  - In 2000, MWI’s dropped to the 30th largest source.
- Approximately 5.7 percent of women between ages 16 – 49 had blood mercury concentrations greater than the current reference dose level (5.8 ug/L) (1990 – 2002, NHANES);
- Children who are prenatally exposed to concentrations of methyl mercury above the reference dose may be at increased risk of performance or neurobehavioral tests;
- States, tribes, and territories issued 3,221 fish advisories in 2004, an increase of 132 advisories from 2004 levels, and 35% of the nation’s total lake acreage and 24% of total river miles;
- Hospitals generate over 2 million tons of waste annually.
Background: U.S. Program Why H2E?

- EPA Region 5 initiated pilot voluntary program idea with American Hospital Association in 1998
- OPPT helped turn the Hospitals for a Healthy Environment into a national voluntary program, with the goals to:
  - Virtual elimination of mercury-containing waste and products by 2005
  - Thirty three percent reduction in waste volume by 2005, and 50 percent reduction by 2010
  - Reduction of persistent, bio-accumulative, and toxic (PBT) chemicals as opportunities arise
Background: U.S. Program

H2E Achievements

- As of May 24, 2007 H2E has 1,385 Partners representing over 7,300 facilities nationwide (1,600 of which are hospitals), or over 20 percent of the 7,000 hospitals in the U.S.

- Since 1988, over 6,000 Medical Waste Incinerators have closed.

- Combined with the phase-out of mercury containing devices and improved waste management practices, overall emissions of mercury from healthcare facilities fell by 99%, from 49.7 tons per year (TPY) in 1990 to 0.2 TPY in 2002.
Applying the Model to Chinese Health Care Sector: Background

- China’s health care sector much larger
  - 30,000 hospitals vs. 7,000 in U.S.
- Potentially, Hg use much larger
  - Medical use of Hg expected to be 170 tons, increase of nearly 300% from 1995 levels (2000)
  - China produces 120 – 150 million thermometers per year, 40% for internal consumption (2005)
- Anecdotally, per-facility use is high (for 1000 bed)
  - Replace 8,000 thermometer/year
  - Replenish sphyg’s with 2,000 gm of Hg/year
- Medical waste estimated @ 0.5 million ton/year
Applying the Model to Chinese Health Care Sector: Background

Chinese government recognize medical waste as a complex set of problems:

- Different types of waste need to be treated & disposed of differently:
  - Infectious
  - Hazardous
  - Pathological
  - Chemical
  - Solid
- Contingency for possible SARS outbreak
Applying the Model to Chinese Health Care Sector: Background

China is improving its medical waste management system. Examples:

• GEF project to build medical waste incinerators
  ✓ Better disposal of medical waste
  ✓ Guard against potential SARS outbreak
• EPA assistance in improving waste management plans
• Hospital mercury elimination pilot
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

Chinese government chose two teaching hospitals with national reputations in Beijing:
• Tiantan Hospital:
  • 1,000 bed facility
  • Well known neurological research center
  • Loses about 10,000 g of Hg per year
• Jisuitan Hospital:
  • 1,051 bed facility
  • Well known for trauma surgery
  • Loses 7400 g of Hg per year
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

US experts conducted full-facility audit on both hospitals:

• Mercury-containing devices restricted to thermometers, blood pressure cuffs, fluorescent light bulbs
• No Hg-containing esophageal dilators or Hg-containing chemicals found
• Both hospitals maintain daily inventory logs
  • Tiantan Hospital purchases 8000 thermometers per year, and uses 2000 g of Hg for calibrating blood pressure cuffs per year
  • Jisuitan Hospital loses 6000 g of Hg from thermometers, and 1400 g from blood pressure cuffs per year
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

Barriers to success:
• Staff and patient education
  • Accuracy myth
  • Environmental & public health implications
• Economic barriers
  • No cost for clean up spilled mercury in China vs. $1000 - $2000 per incident in the U.S.
  • Cost for non-mercury alternatives significantly higher
    • Hg Blood pressure cuffs cost $85 RMB to purchase, $15 RMB to inspect or repair
    • Electronic blood pressure cuffs cost $15000 RMB to purchase, $240 to inspect, $800 to repair
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

How to overcome these barriers?

• Staff & patient education:
  ✓ Nurses very receptive to training – quick grasp of Hg’s potential human health and environmental impact
    • Shared American Nurses Association Continuing Education module with hospitals
  ✓ Patients & doctors will be harder to educate – regarding accuracy myth
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

How to overcome these barriers?

• Economic barriers
  ✓ We are exploring ideas right now
    • Stimulate domestic manufacturing
    • Looking for less expensive, but clinically acceptable Hg-free alternatives
  ✓ Your ideas appreciated!
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

For more information, contact:

Chen Wen 温乘炘
Office of Pollution Prevention & Toxics
US Environmental Protection Agency
202-564-8849
Wen.chen@epa.gov