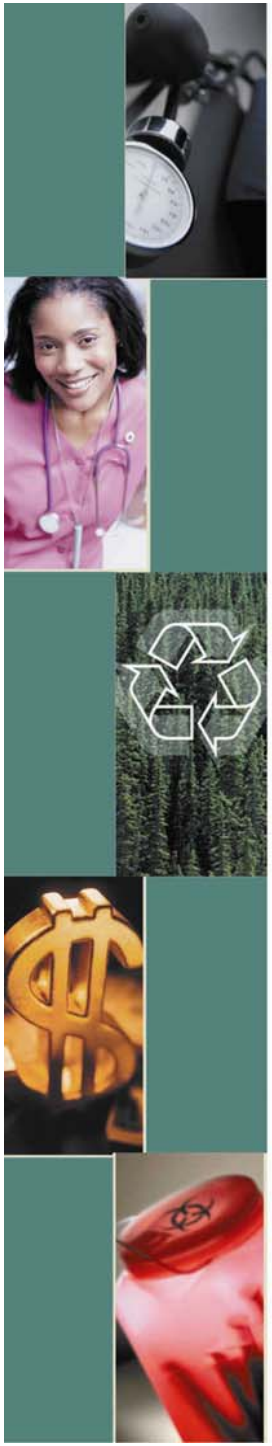
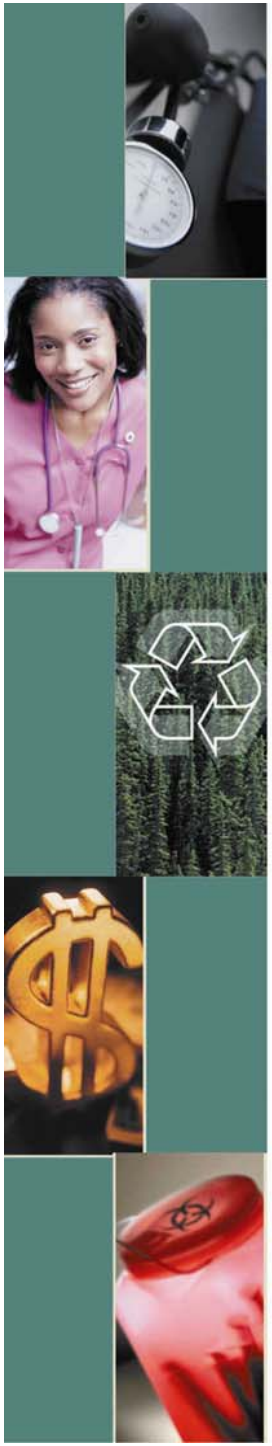


BEIJING HEALTH CARE SECTOR MERCURY ELIMINATION PILOT

BRIEFING FOR

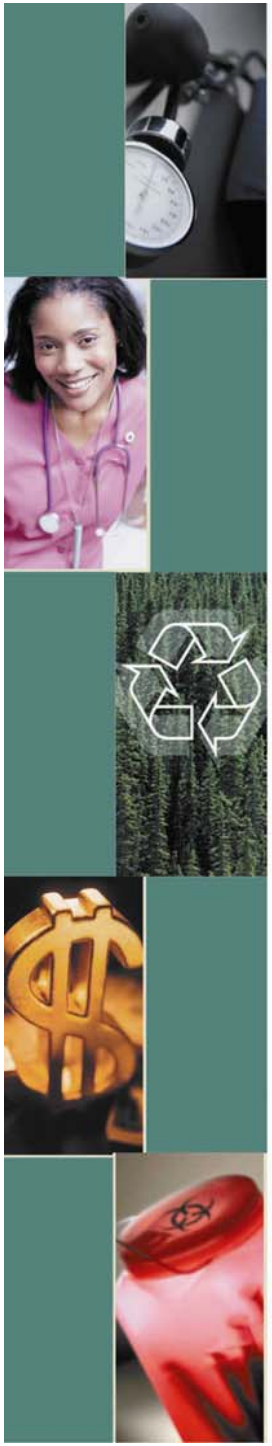
China Environment Forum,
Woodrow Wilson Center

May 30, 2007



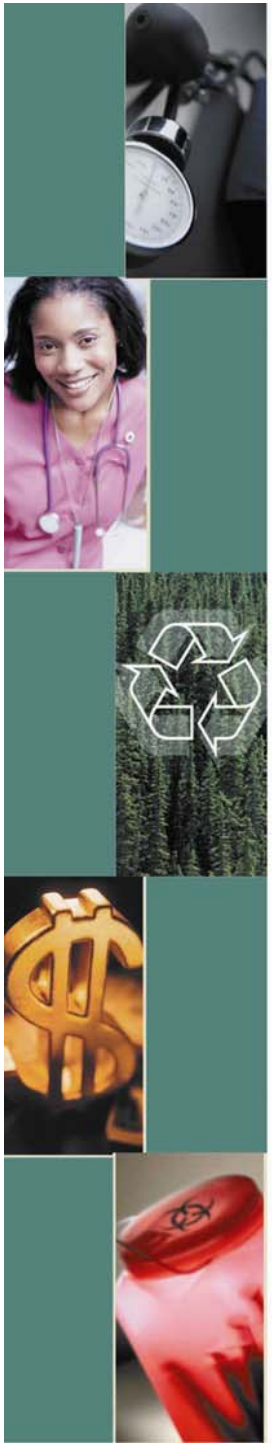
Background: U.S. Program Why Mercury & Waste?

- 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

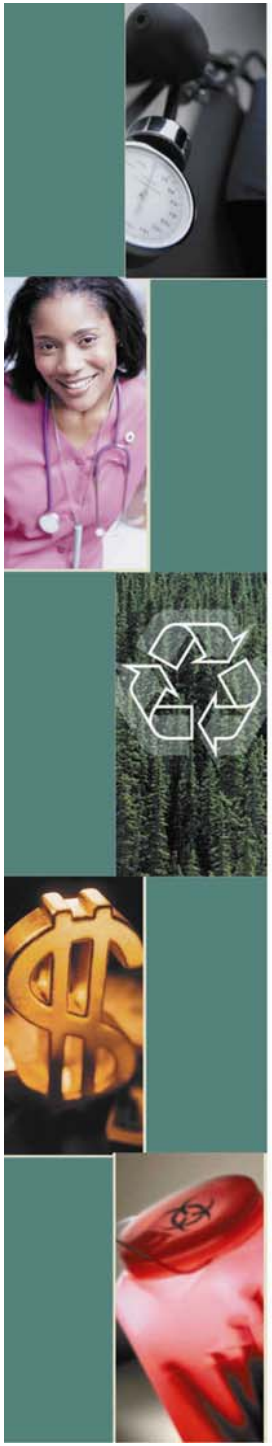


Background: U.S. Program H2E Achievements

- 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.

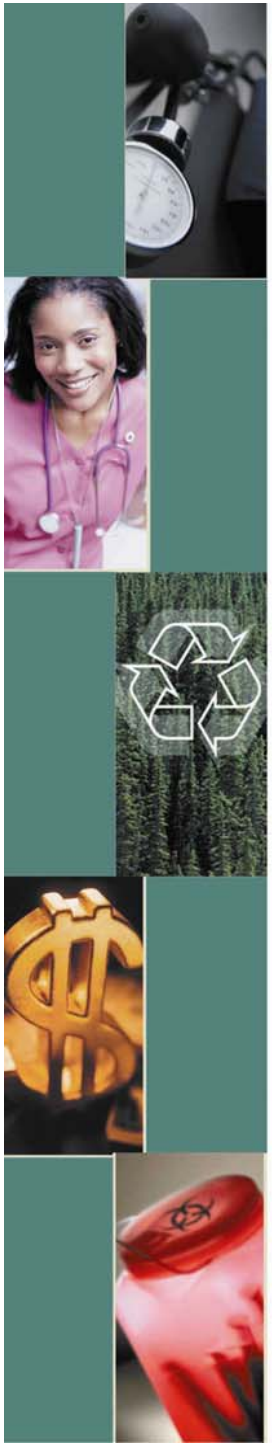
- Since 1988, over 6,000 Medical Waste Incinerators have closed.

- 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

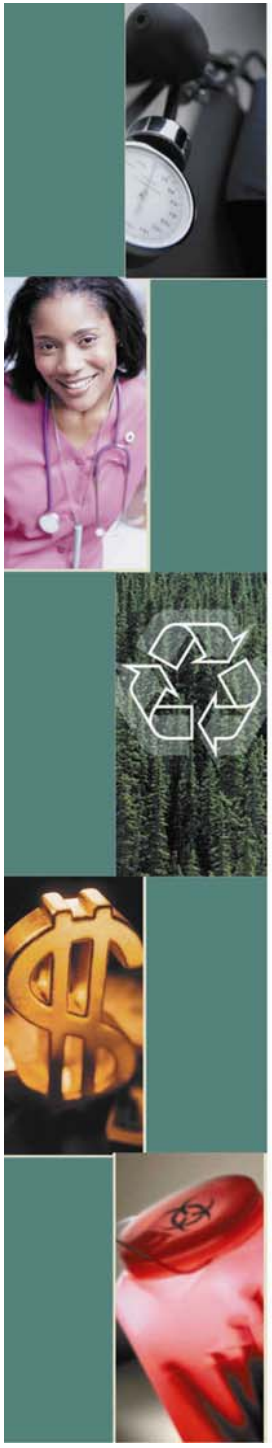
- China's health care sector much larger
  - ✓ 30,000 hospitals vs. 7,000 in U.S.
- Potentially, Hg use much larger
  - ✓ Medical use of Hg expected to be 170 tons, increase of nearly 300% from 1995 levels (2000)
  - ✓ China produces 120 – 150 million thermometers per year, 40% for internal consumption (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:

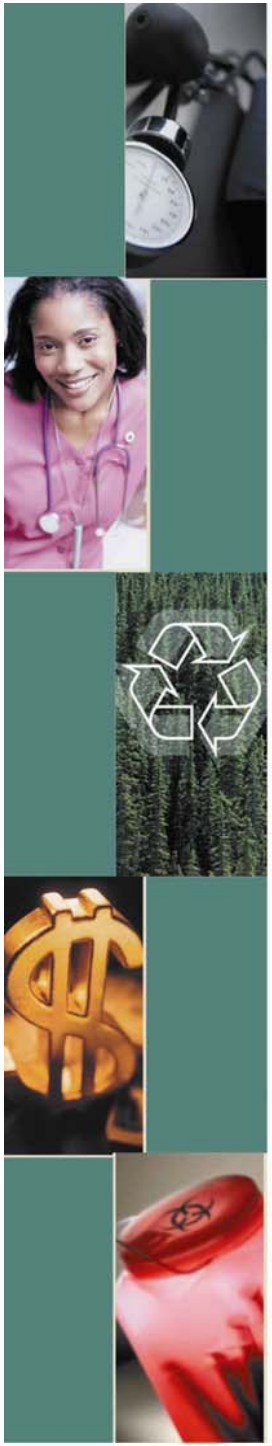
- Different types of waste need to be treated & disposed of differently:
  - ✓Infectious
  - ✓Hazardous
  - ✓Pathological
  - ✓Chemical
  - ✓Solid
- Contingency for possible SARS outbreak



Applying the Model to Chinese Health Care Sector: Background

China is improving its medical waste management system. Examples:

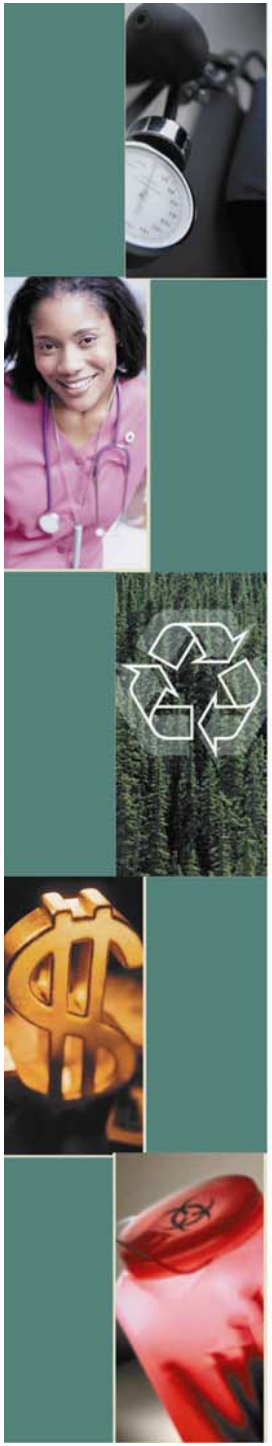
- GEF project to build medical waste incinerators
  - ✓Better disposal of medical waste
  - ✓Guard against potential SARS outbreak
- EPA assistance in improving waste management plans
- Hospital mercury elimination pilot



Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

Chinese government chose two teaching hospitals with national reputations in Beijing:

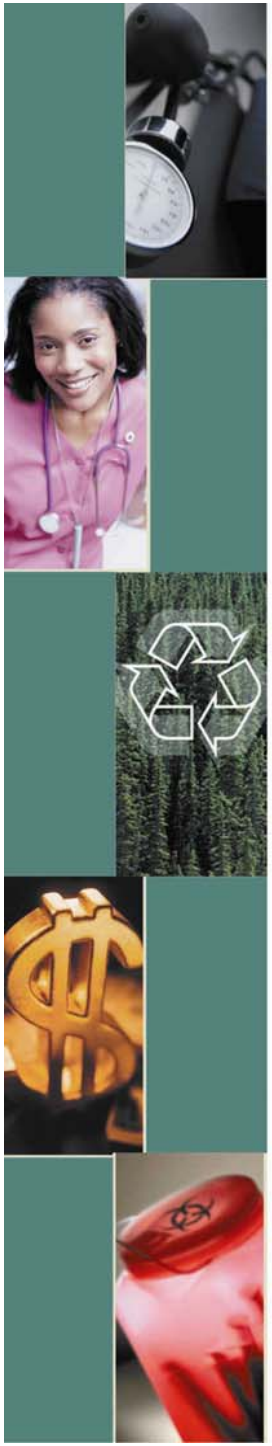
- Tiantan Hospital:
  - 1,000 bed facility
  - Well known neurological research center
  - Loses about 10,000 g of Hg per year
- Jisuitan Hospital:
  - 1,051 bed facility
  - Well known for trauma surgery
  - Loses 7400 g of Hg per year



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

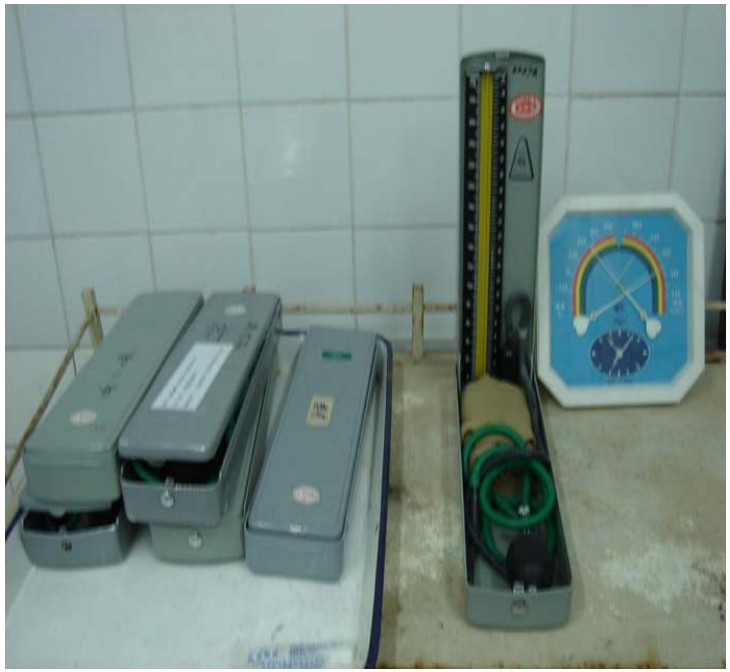


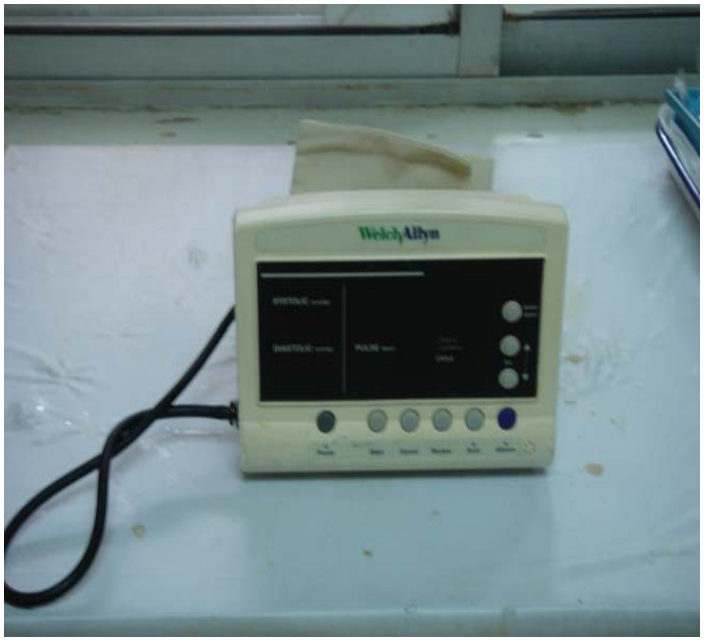
Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

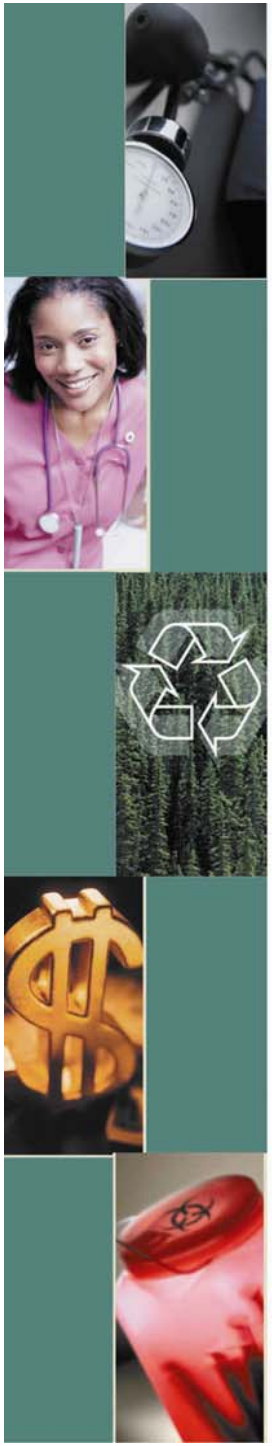
Barriers to success:

- 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



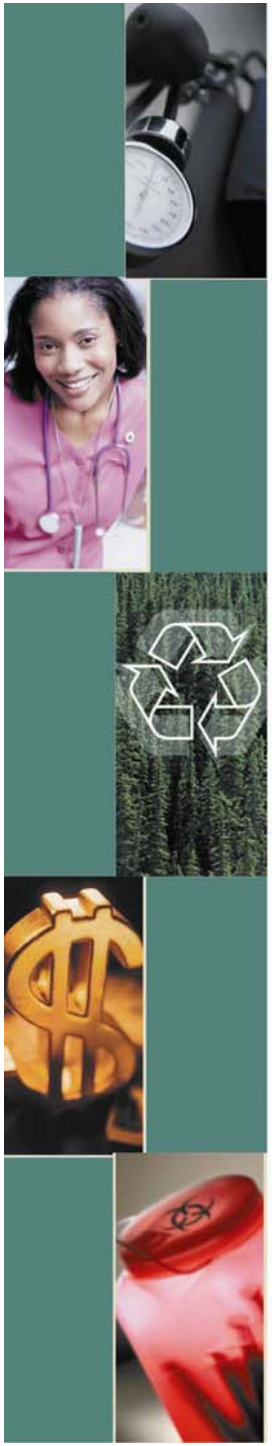




Applying the Model to Chinese Health Care Sector: Hospital Hg Pilot

How to overcome these barriers?

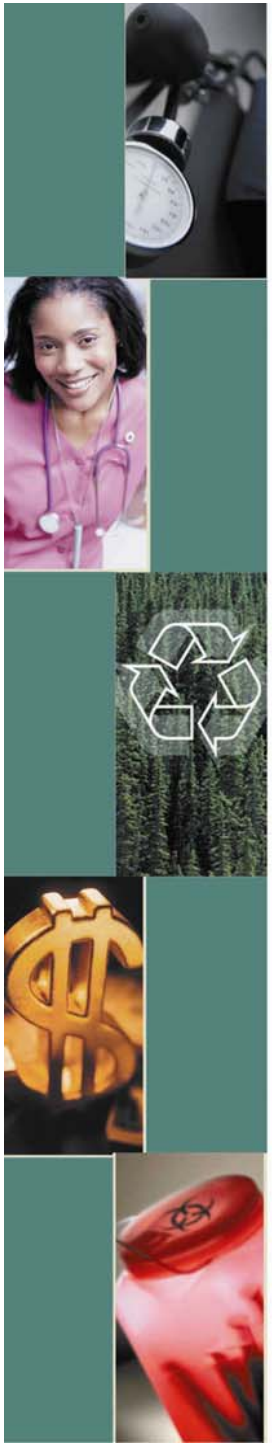
- Staff & patient education:
  - ✓Nurses very receptive to training – quick grasp of Hg's potential human health and environmental impact
    - Shared American Nurses Association Continuing Education module with hospitals
  - ✓Patients & doctors will be harder to educate – regarding accuracy myth



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

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