Addressing Lack of Safe Drinking Water and Sanitation in the Developing World.

4th World Water Forum
Mexico City, Mexico

Session: FT3.28
Strategies and Technologies for Arsenic and Fluoride Mitigation from Drinking Water

Judith E. Ayres
Assistant Administrator, US Environmental Protection Agency
Office of International Affairs

March 19, 2006
Today

- Background
- Global Response
- US Government Response
- Water Safety Plans
- Conclusions
Background

- 1.1 billion without access to safe drinking water.
- 2.6 billion without access to sanitation.
- Each year, 3 billion suffer from water related diseases.
- Each year, 2.5 million die, most are children under the age of 5.
- Over half of all hospital beds in the developing world are occupied by people suffering from water-borne disease.
- At current pace, 135 million could die by 2020.
Health Impact: Microbial Contamination

- Water Quality
- Water Quantity
- Sanitation
- Hygiene

Source:
- Fewtrell & Colford, 2004
- Esrey, 1985
The adverse effect of arsenic and fluoride on health.

- Arsenic is a global problem most prevalent in 10 countries in Asia
  - 40 million are people at risk in Bangladesh, China, and India.
- The US standard is 10 parts per billion (ppb), consistent with WHO guidelines.
- 13 million people in the US (mostly western States) are affected by arsenic in ground water.
- Fluorosis is also having overwhelming impact in over 25 countries around the world.
- In the US, there is ongoing debate on effects of fluoride in drinking water.
Health Impact: Arsenic

- Arsenicosis
- Cancer
  - Skin, almost all organs
- Non-cancer
  - Dermal Effects
  - Reproductive and Developmental Effects
  - Neurological Effects
- Possible transfer from mother to child
- Damage to health is irreversible and untreatable.
Health Impact: Fluoride

- Dental Fluorosis
- Skeletal Fluorosis
- Soft tissues/organs
- Non-skeletal fluorosis
- Neurological Effects
Mitigation efforts in Asia have focused on the most effective interventions.

- Screening and testing of all drinking water wells for arsenic and fluoride contamination.
- Educating users, without causing panic:
  - The problem of arsenic and/or fluoride contamination
  - Consequences of exposure, and how to deal with them
- Identifying and implementing alternative safe water options.
The Global response to arsenic and fluoride contamination.

- Development of the arsenic monograph and rapid assessment protocol, by WHO, UNICEF, and other agencies.
- Awareness raising on arsenic and fluoride in all affected countries, with communities, governments and civil society.
- Support development of policy, national standards, monitoring and community surveillance.
- Promote information networking, knowledge dissemination, and operational research.
- Encourage resource mobilization at the grass-roots level.
The US response to arsenic and fluoride contamination.

- 13th Meeting of Commission on Sustainable (CSD13), April 2005:
  - Urged governments to prioritize water in national development plans.
  - Emphasized public-private partnerships.
  - Launched “Health through Water” Partnership:
    - Household water treatment and safe storage
    - Economic valuation of water/sanitation approaches
    - Environmental health impact assessments
    - Water Safety Plans
Four questions we must ask ourselves.

- What is the public health risk based on existing As and Fl contaminant levels?
- What are the public health goals?
- What is achievable?
  - For example: In the US, treatment varies among communities based on public health goals.
- How do we sustain--over the long-run--public health gains?
What is missing: Moving beyond the simple willingness to act.

- Alignment between those with know-how and resources and those with desperate need.
- Unified focus on action, not further deliberation.
- Straight-forward guidance along simple “principles.”
- A central repository of information of shared practices, linking actions to MDGs.
Solutions must follow a few basic principles.

- Interventions must be based on actual health-risk based assessments.
- The problem is global, but solutions are local.
- Top-down/bottom-up interventions must be coordinated and not implemented in isolation.
- Solutions must be sustainable: Economically viable and not rely on subsidies.
- Investments must focus on opportunities to “scale-up” successful approaches.
- Focus, focus, focus, either geographically or in certain sector.

- In 3rd Guidelines for Drinking Water Quality.
- A health-risk based assessment of a water supply system designed to:
  - (1) identify and address places where biological and chemical contaminants enter the water supply, and;
  - (2) establish protocols to ensure sustainability.
- Without it, health-risk based interventions are like “shooting in the dark.”
In Conclusion.

- We believe in action **now**.
- Resources available, but misdirected.
- First step is developing a standard method to “triage” water systems to pinpoint greatest health-based need.
- An informal network that adopts this will help steer available resources where they are most needed.
In times of great change, the learners inherit the earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists.

Eric Hoffer