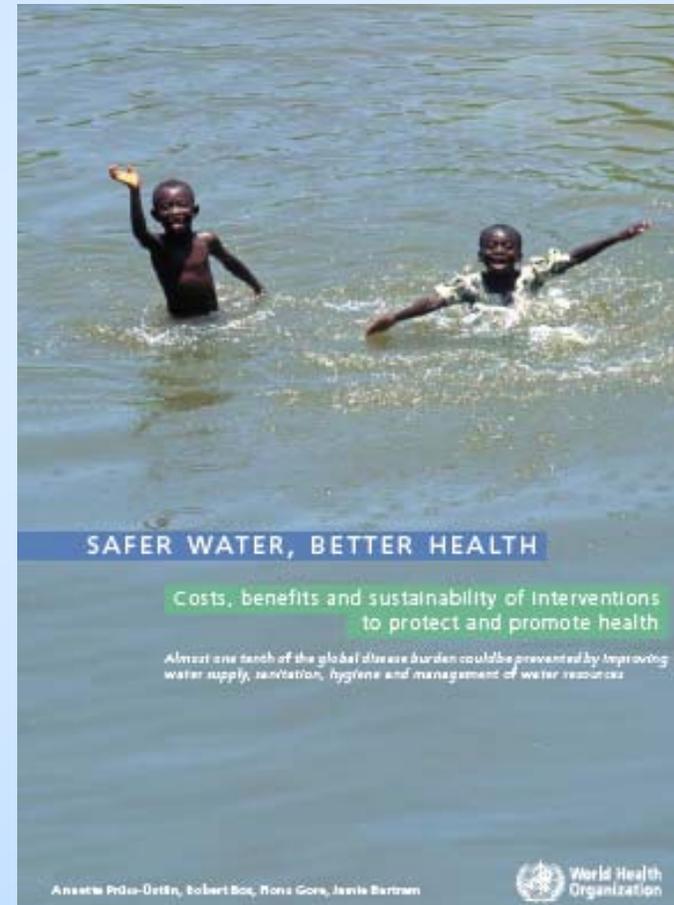


Water Safety Plan Implementation: Huaquillas, Ecuador and Aguas Verdes, Peru

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HSHPS/CDC (NCEH) Internship
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July 22, 2008

Environmental Health

- Environmental interventions prevent disease and decrease the burden on the health care systems
- Water, Sanitation and Hygiene Related Deaths, 2002⁽¹⁾
 - Ecuador: 3.4 % of total deaths
 - Peru: 3.9 % of total deaths
 - U.S.A: 0.4% of total deaths
- Diarrheal Disease: 1.4 million preventable child deaths per year
 - 80% of cases are attributable to unsafe water, inadequate sanitation or insufficient hygiene.⁽¹⁾



(1) WHO, Safer Water, Better Health: Costs, benefits, and sustainability of interventions to protect and promote health; WHO 2008.

Evaluation of the Water Supply of Huaquillas, Ecuador and Aguas Verdes, Peru

- 5 service indicators provide the basis for setting targets for community water supplies⁽¹⁾
 1. **Quality:** compromised by clandestine connections, problems with surveillance
 2. **Coverage:** many do not have direct access
 3. **Continuity:** ~ 8 hours/day for those with direct access
 4. **Quantity:** dependant on size of the container
 5. **Cost:** may prevent some from having access

(1) Guidelines for Drinking Water Quality, Third Edition, Volume 1: Recommendations, World Health Organization, Geneva 2004. pg 90.

Importance of Continuity

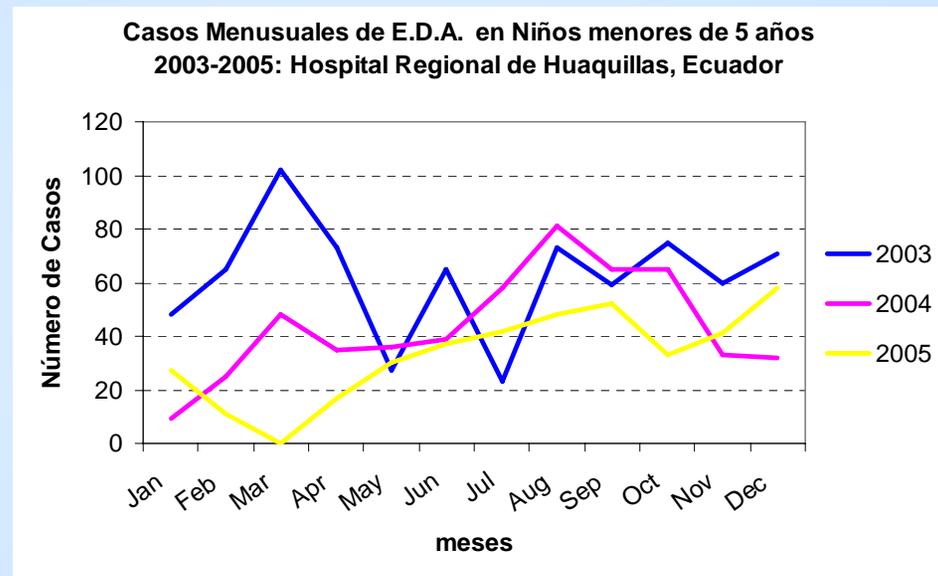
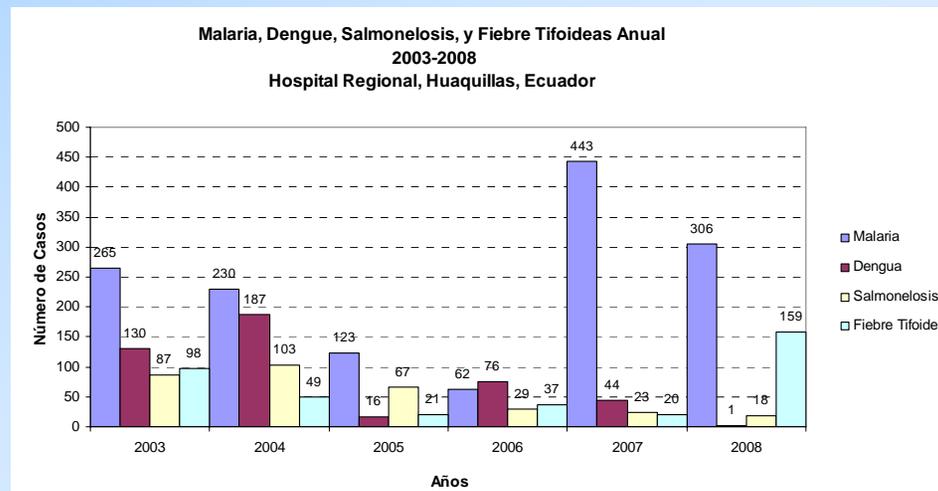
- **Lack of continuity affects hygiene in different ways**
 - Results in low supply pressure and a consequent risk of in-pipe recontamination⁽²⁾
 - Reduced availability and lower volume use, which adversely affects washing habits
 - Household water storage may be necessary, and this may lead to an increase in the risk of contamination during transport, storage and handling
- **Ensuring good quality is not enough to decrease incidence of water related disease**
 - Main route of transmission is water-washed**

(2) Guidelines for Drinking Water Quality, Second Edition, Volume 3: Surveillance and control of community supplies, World Health Organization, Geneva 1997. pg 76.

Health Data Analysis – Huaquillas, Ecuador

- Created a database to organize water-related disease data for Huaquillas, Ecuador
 - Analyzed data from 2003 to 2005 for water related diseases including:
 - Hepatitis A, Malaria, Dengue, Salmonellosis, Typhoid Fever, Acute Diarrheal Disease
- Goals:
 - Present data in an organized manner to show disease trends
 - Provide data so that people involved in water provision may be able to correlate outbreaks with specific problems with water distribution system
 - Analyze data for problems
 - Calculation errors, missing data (i.e. no diarrheal data for 2006-2008)
 - The data used to make recommendations should be of appropriate quality in order to provide a solid base for any conclusions

Presentation of Data



Water Related Disease Data Sheet

- Compiled and contributed to a water-related disease data sheet in Spanish
 - Used *Handbook for Communicable Disease*
 - Described water related disease breakdown: waterborne, water-washed and vector related
 - Emphasized connection between hygiene and disease
 - Categories included: disease, reservoir, mode of transmission, preventative measures
 - Focused on specific considerations for controlling contamination in environments where water must be stored
 - Hygiene measures
 - Storage containers standards

List of Diseases

- Amibiasis
- Cólera B
- Cisticercosis Humana
- Criptosporidiosis
- Dengue Clásico (Fiebre rompehuesos)
- E. coli Verotoxica
- Enteritis por Campylobacter
- Esquistosomiasis (bilharzia, fiebre por caracoles)
- Fiebre Tifoidea
- Fiebre Paratifoidea / tifoidea
- Frambiosa
- Gastroenteritis Víricas Agudas
- Giardiasis
- Hepatitis Vírica
- Intoxicación plaguicida
- Leishmaniasis (cutánea – uta)
- Leptospirosis
- Malaria (Paludismo)
- Salmonelosis
- Shigelosis (Disentería Bacillaria)
- Teniasis Intestinal por Taenia Solium (tenia de la carne de cerdo)

Evaluation of Water Quality; Huaquillas, Ecuador and Aguas Verdes, Peru

- Gather most up to date water quality standards for Peru and Ecuador
 - Both very comparable to EPA standards
- Compile information on importance of pH, turbidity and chlorine residual surveillance
- Make recommendations about data collection

Environmental Health and Preventative Medicine

- A healthy environment can play a crucial role in interrupting disease transmission pathways, preventing disease and reducing disease burden at global, regional, and country levels
- “Improving water, sanitation, and hygiene has the potential to prevent at least 9.1% of the global disease burden.”^[3]

[3] WHO, Safer Water, Better Health: Costs, benefits, and sustainability of interventions to protect and promote health; WHO 2008.