

# Global Water Pathogen Project

- PART ONE. THE HEALTH HAZARDS OF EXCRETA: THEORY AND CONTROL
  - Introduction to the Importance of Sanitation
  - Environmental Aspects and Features of Critical Pathogen Groups
  - Risk Assessment for Sanitation
  - Gender, Women and Sanitation
- PART TWO. INDICATORS AND MICROBIAL SOURCE TRACKING MARKERS
  - Microbial Indicators - “Workhorses” in the Field of Health-related Water Quality Testing
  - General and host-associated bacterial indicators of faecal pollution
  - General and host-associated bacteriophage indicators of faecal pollution
  - Human and animal enteric viral markers for tracking the sources of faecal pollution
  - Using indicators to assess microbial treatment and disinfection efficacy
  - Evaluation of subsurface microbial transport using microbial indicators, surrogates and tracers
- PART THREE. SPECIFIC EXCRETED PATHOGENS: ENVIRONMENTAL AND EPIDEMIOLOGY ASPECTS
  - SECTION I. VIRUSES
    - Adenoviruses
    - Hepatitis A
    - Hepatitis E
    - Norovirus and other Caliciviruses
    - Papillomavirus
    - Polioviruses and other Enteroviruses
    - Polyomavirus
    - Rotavirus and Astrovirus
    - Summary of Excreted and Waterborne Viruses
  - SECTION II. BACTERIA
    - Aeromonas
    - Arcobacter
    - Members of the family Campylobacteraceae: *Campylobacter jejuni*, *Campylobacter coli*
    - Pathogenic members of *Escherichia coli* & *Shigella* spp. Shigellosis
    - *Helicobacter pylori*
    - *Leptospira* and Leptospirosis
    - *Salmonella*, Enteric Fevers, and Salmonellosis
    - *Vibrio cholerae* and Cholera biotypes
    - Antimicrobial Resistance: Fecal Sanitation Strategies for Combatting a Global Public Health Threat
  - SECTION III. PROTISTS
    - *Balantidium coli*
    - *Blastocystis*
    - *Cyclospora cayetanensis*
    - *Cryptosporidium* spp.
    - *Entamoeba histolytica*
    - *Giardia duodenalis*
    - Microsporidia

- *Toxoplasma gondii*
- SECTION IV. HELMINTHS
  - Cestodes
    - Diphylobothriidae
    - *Echinococcus* spp.
    - *Taenia* spp.
  - Nematodes
    - *Ascaris* spp.
    - Hookworms
    - *Toxocara* spp.
    - *Trichuris trichiura*
  - Trematodes
    - The Liver Flukes: *Clonorchis sinensis*, *Opisthorchis* spp, and *Metorchis* spp.
    - Intestinal Flukes: *Heterophyidae* and *Echinostomatidae*
    - *Schistosoma* spp.
- PART FOUR. MANAGEMENT OF RISK FROM EXCRETA AND WASTEWATER
  - Persistence
    - Persistence of Pathogenic Microorganisms in Fecal Wastes and Wastewater Matrices: An Introduction and Overview of Data Considerations
    - Persistence of Pathogens in Sewage and Other Water Types
    - Pathogen Specific Persistence Modeling Data
    - The Persistence of Indicators and Pathogens in Wastewater Biosolids-amended Soil
  - Sanitation System Technologies
    - Overview and Introduction
      - Understanding Pathogen Reduction in Sanitation Systems: Units of Measurement, Expressing Changes in Concentrations, and Kinetics
      - Collection and Conveyance of Excreta and Wastewater in On-Site and Off-Site Systems
    - Pathogen Reduction in Non-Sewered (On-site) System Technologies
      - Pit Toilets (Latrines)
      - Composting and Dry Desiccating Toilets (Latrines)
      - Cesspits and Soakpits
      - Septic Systems
    - Pathogen Reduction in Sewered System Technologies
      - Sludge Management: Biosolids and Fecal Sludge
      - Preliminary Treatment and Primary Sedimentation
      - Anaerobic Sludge Blanket Reactors
      - Activated Sludge
      - Membrane Bioreactors
      - Media Filters: Trickling Filters and Anaerobic Filters
      - Waste Stabilization Ponds
      - Constructed Wetlands
  - Disinfection
    - Physical Agents
    - Chemical disinfectants
    - Emergency Response
- PART FIVE. CASE STUDIES
  - A framework for safe sanitation systems
    - How to use the GWPP knowledge? A risk management approach for safe sanitation
  - Application of the risk-based framework - is it safe?
    - Disease burden due to gastroenteritis infections among people living along wastewater reuse system in Hanoi, Vietnam

- Health risk of biogas effluent exposure and handling in Vietnam
  - Wastewater reuse in agriculture and health risk in Vietnam
  - Can farmers in Boliva safely irrigate non-edible crops with treated wastewater?
  - Is it safe to use untreated greywater to irrigate vegetables in my backyard?
  - Salmonella/Shigella/Vibrio in treated effluents and impact on downstream water users (South Africa)
  - Regulation for safe system design
    - Australian guidelines for water recycling - setting health based performance targets and safe use of wastewater
    - Building a safe recycled water scheme
    - How do I ensure my existing recycled water scheme is safe?
  - System planning: evaluation of alternative scenarios
    - Risk assessment of sanitation, water supply and hygiene in rural Brasil
    - Mapping pathogen emissions to surface water using a global model with scenario analysis
    - The QMRACatch approach for guiding sustainable water safety management options at a large river.
    - Validation of high rate algal ponds as an efficient wastewater treatment option to improve public health in rural communities
    - Pathogen flows in urban environments and their public health risks: A new conceptual approach to inform sanitation planning
  - Managing risks by targeting pathogen sources
    - E. coli and enterococci subtyping to discriminate contamination sources in wastewater treatment ponds
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