

Climate Change, Health and Sustainable Development

by

Christopher Cox PhD

Environmental Health and Sustainable Development Department
Caribbean Public Health Agency (CARPHA)

12th Meeting

**Caribbean National Epidemiologists and
Laboratory Directors**

Hyatt Regency Trinidad

Port of Spain, Trinidad and Tobago



Areas of focus for environmental health and environmental management

- Water resources management
- Solid waste management
- Chemicals and hazardous substances management
- Air quality management
- Cross-cutting:
 - Climate change – impacts across many areas; for example:
 - Water security threatened – changing rainfall patterns means changing water availability
 - Accelerated spread of disease – influenced by temperature and moisture regimes
 - Ambient air quality changes – influenced by changes in regional and global rainfall/temperature regimes (eg sub-Saharan dust pulses)

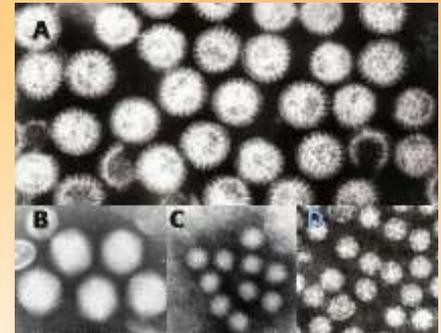
Human and ecosystem health hazards

- **Human health**

- Contact with contaminated waters (drinking, recreation)
 - Ear infections
 - Dysentery – Severe diarrhea
 - Typhoid Fever
 - Viral and Bacterial Gastroenteritis
- Vector proliferation
 - Mosquito breeding
 - Dengue and Chikungunya virus
 - Rodent proliferation
 - Leptospirosis

- **Ecosystem health**

- Terrestrial eco-toxicity – chemicals and hazardous substance accumulation in soils
- Compromised reef systems
- Hypoxic 'dead' zones in marine environments



Water resources management (water and sanitation)



- Freshwater
 - Drinking water supply/water scarcity (surface and ground water)
 - Food security – irrigated agriculture (typically surface sources)
 - Contact recreation (rivers, lakes)
- Coastal waters
 - Contact recreation (beaches)
 - Food security – fish stock health
- Water safety - Reduce hazards in water supply systems, from the water supply sources, through the distribution network and within the household.
 - Critical in disaster response; both drought and flood related
 - close collaboration with ministry of health as the regulator and water utilities as the service providers
- Recreational/coastal water quality – reduce hazards from land-based sources of pollution.
 - Risks from unimproved sanitation, untreated effluent discharges, other pollutants

Water resources management (water and sanitation)

- **Primary country support needs - Pollution assessment and control**
 - Contribute to the development and adoption of best practices
 - Build capacity for water resources management
 - Deepen engagement of high level policy makers
 - Contribute to the development of national Integrated Water Resources Management (IWRM) Plans
 - Support the strengthening of policies and legislation



Solid waste management

- Pest and disease control
 - Rodent, insect (mosquitos) proliferation
- **Primary country support needs – waste minimization and diversion**
 - Innovation in waste diversion, reduction and re-use; recycling, waste-to-energy
 - Divert green/organic waste; safe disposals – reduce rodent populations
 - Reducing risk associated with indiscriminate plastics disposal and flood exacerbation (in watercourses) – invest in recycling
 - Reduce stockpiling of types, white waste – accumulation of water and breeding sites for mosquitoes – invest in recycling
 - Minimize leachate discharge and toxic impacts
 - Concern over hazardous chemicals and other substances in the wastestream
 - Support waste management policy design
 - Support to sustained advocacy and awareness-raising



Chemicals and hazardous substances management

- Chronic and acute exposure
 - Environment – ecotoxicity: accumulation of harmful substances within soils, water with indirect (longer-term) impacts
 - Human – direct impacts
- **Primary country support needs – safe handling practices and chemicals life cycle management**
 - Policy development and strengthening regulatory environment
 - Provide guidance to the establishment of poison centres
 - Support knowledge management for decision making
 - Strengthen management capacities amongst practitioners
 - Promote and support advocacy
 - Provide technical guidance for assessments and strengthen diagnostic capacities at national level
 - Support applied research



Air quality management

- Indoor environment
 - Respiratory, eye irritants - mould, dust, VOCs
- Outdoor/ambient
 - Sub-Saharan dust, other dust/particulates, smoke, exhaust emissions, odour nuisances
- **Primary country support needs – various**
 - Build capacity in air quality assessment amongst health professionals
 - Support the strengthening of local diagnostic capabilities
 - Assist in the formulation of policies, legislation and regulations
 - Support and participate in applied research



Linking epidemiological and environmental assessments

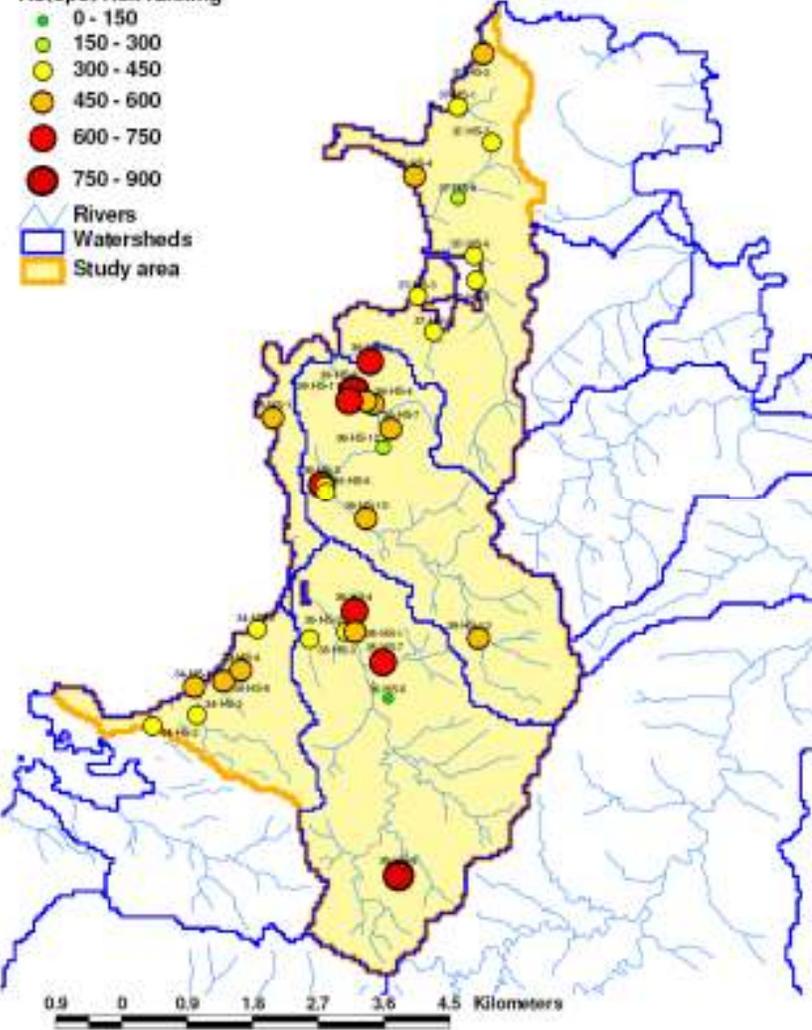
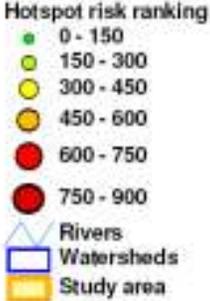
- Explain trends in disease occurrence
- Assist in directing and targeting interventions and investments based on health-based evidence – priority setting
- Serve to strengthen stakeholder engagement and buy-in to remediation
- Proposed:
 - Develop/harmonized data reporting protocol between epi data and environmental assessment
 - Share common database management system; attempt to build in the option of adding environmental parameters
 - Typical examples where such linkages are needed:
 - Drinking water quality within water supply systems and occurrence/reports of diarrhea
 - Recreational water quality and occurrence/reports of infection amongst bathers (ear, eye, skin)
 - Community sanitation and prevalence of mosquito-borne disease

To illustrate - Typical environmental assessment

- Upstream-downstream pollutant loading of environmental hotspots (pollutant sources)

Parameter	Units	Upstream sample	Downstream sample
Enterococci	CFU/100 ml	960	6,700
Faecal Coliform	CFU/100 ml	22,000	380,000
Nitrates	mg/L	0.35	0.13
Phosphate	mg/L	0.65	1.7
Total suspended solids	mg/L	15	11
Turbidity	NTU	18	27
Oils and greases	mg/L	12.9	14.3

- **Needed:** an approach to link this data to human and ecosystem health in a structured manner. The two areas tend to remain isolated



Thank you, questions