

# Public Health and Policy Implications of the Recent Large Drinking Water Outbreaks in Canada

International Conference on  
Emerging Infectious Diseases  
Atlanta, GA. March 25, 2002

Andrea Ellis, DVM, MSc



Health    Santé  
Canada    Canada

“In an age when man has forgotten his origins and is blind to even his most essential needs for survival, water along with other resources has become the victim of his indifference.”

*Rachel Carson in Silent Spring, 1962*

# **Waterborne Outbreak of Gastroenteritis Associated with a Contaminated Municipal Water Supply**

**Walkerton, Ontario, Canada  
May - June 2000**



Health      Santé  
Canada     Canada

# Map of Canada



Walkerton

Southern Ontario

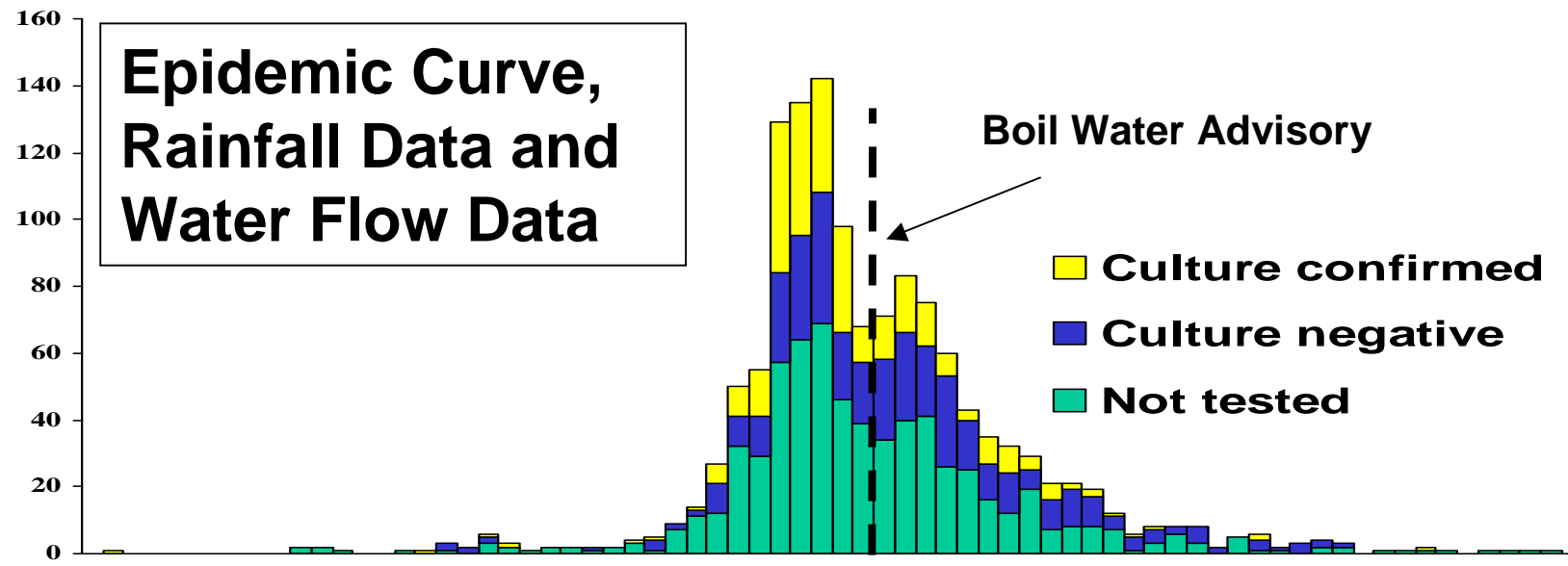


# Main Findings

- 1338 people reported with diarrhea after drinking Walkerton water  
-estimate >2000 actually ill
- 65 hospitalized, 27 developed HUS, 7 died
- water from one of the town's wells positive for *E. coli* O157:H7 by PCR
- cattle on farm adjacent to well positive for *E. coli* O157 and *Campylobacter jejuni* indistinguishable from patients

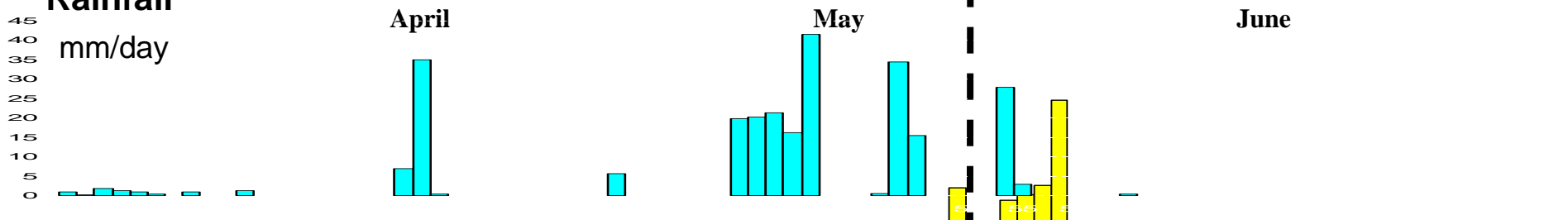
# Epidemic Curve, Rainfall Data and Water Flow Data

Cases



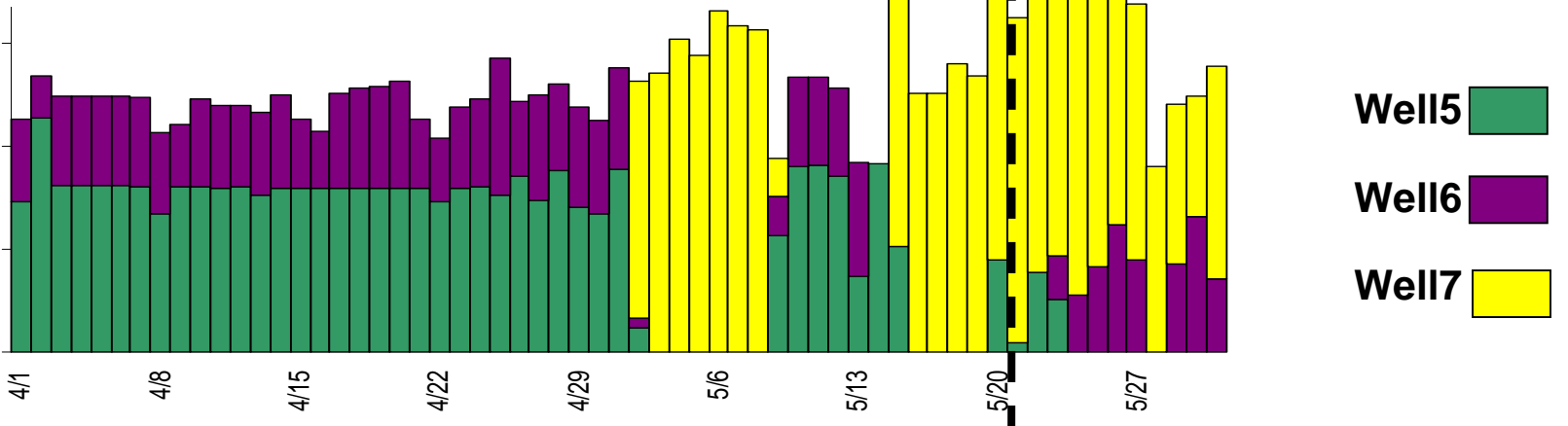
Rainfall

mm/day

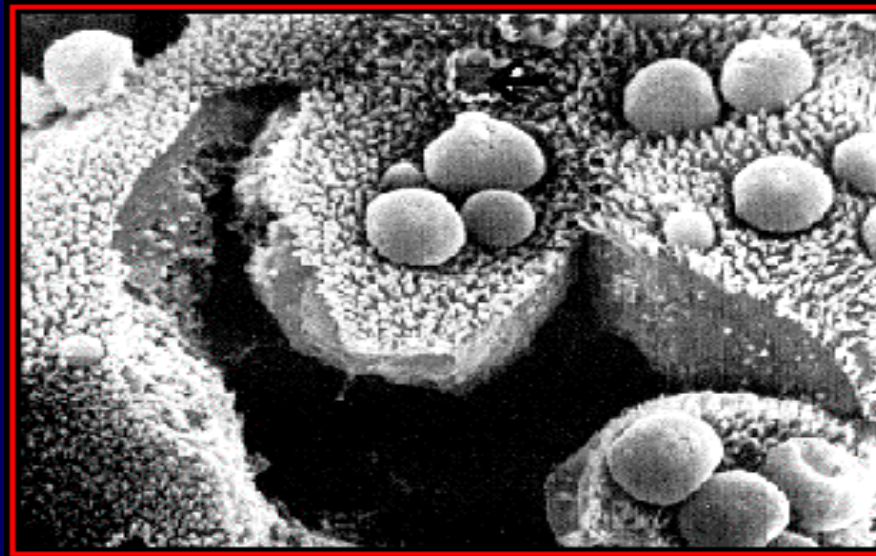


Accumulative Flows - Scada

(l/day)



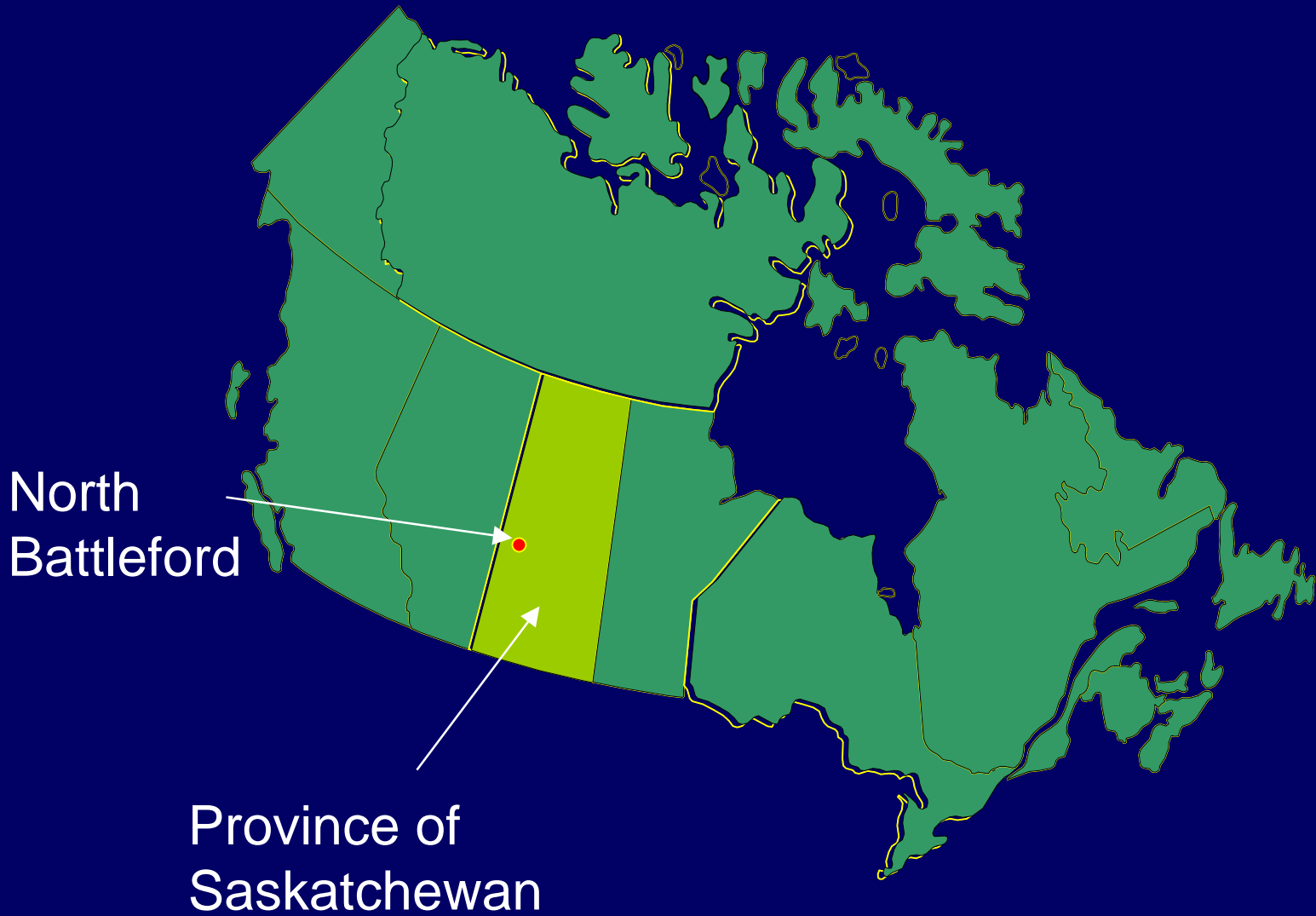
# Cryptosporidiosis Outbreak, Spring, 2001, North Battleford, Saskatchewan



Health    Santé  
Canada    Canada



# Map of Canada

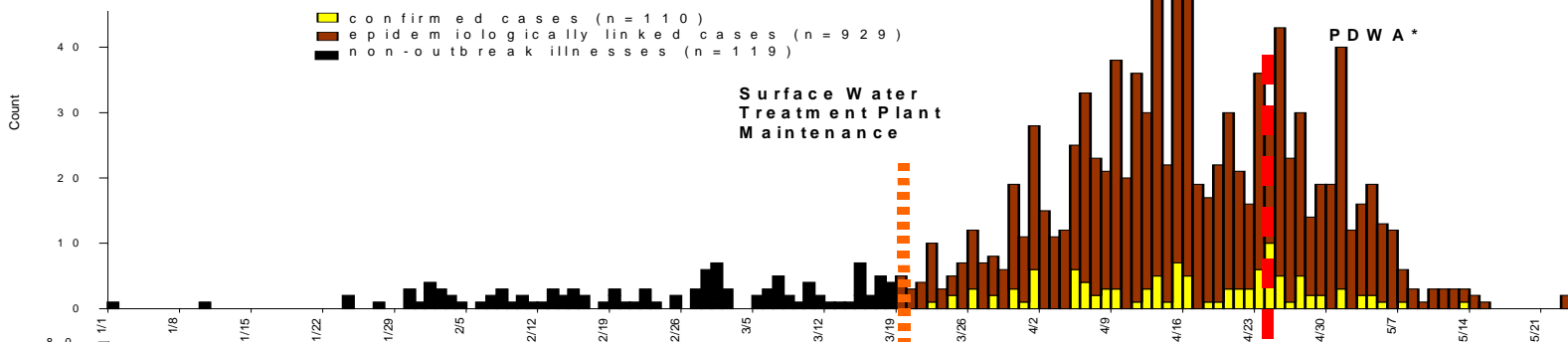


# Main Findings

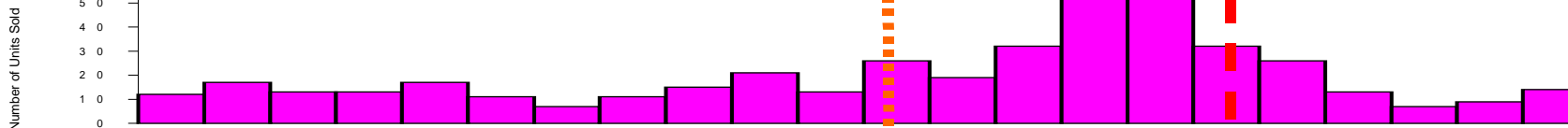
- 1907 people reported illness compatible with cryptosporidiosis
  - estimate 5800-7100 actually ill
- 50 people hospitalized, no deaths
- outbreak co-occurred with a malfunction of the solids contact unit at the filtration plant
- water drawn from river 2km downstream from sewage treatment plant

# Comparison of Water Quality and Disease Burden Data

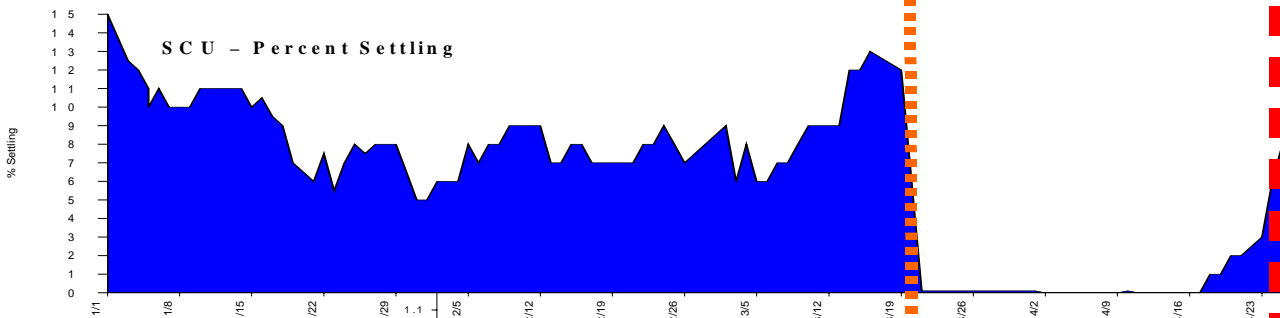
Date of onset of diarrheal illness within the Battlefords Health Service Area



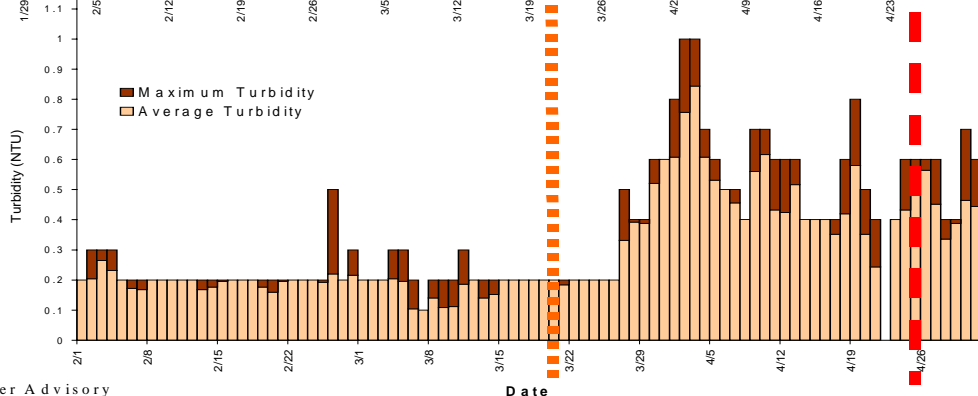
Antidiarrheal drug sales (Pharmacy A)



SCU - Percent Settling



Surface Water Treatment Plant Finished Water Turbidity



\* Precautionary Drinking Water Advisory

# Public Health Implications

- Short term
  - burden on small rural hospitals
  - implementation of boil water policy in the communities
  - plan for alternate water sources in schools and long term care facilities
  - heightened media attention, public fear
  - data inaccessible due to concurrent legal investigations- police, coroner, provincial inquiry

# Public Health Implications cont'd

- Medium term
  - dramatic increase in testing of private wells
  - increase in boil water advisories
  - economic impact on community
- Long term
  - health effects suffered by public health staff and victims
  - public distrust of government's ability to protect public health
  - increased expectations without increased resources

# Water Quality Policy in Canada: Who does what?

Federal-Provincial Committee sets  
National Drinking Water Guidelines

Each province sets and enforces their own  
regulations or guidelines



Water treatment plants locally  
operated

# Changes to policy in the wake of Walkerton and North Battleford

- Ontario: Operation Clean Water
  - strict new drinking water regulations
  - effective inspection and enforcement
  - new funds to improve infrastructure
- Saskatchewan
  - increased inspections
  - clarified response and reporting protocols
  - mandatory operator certification by 2005

# Outstanding Policy Issues

- How do we ensure ground water sources are not impacted by surface water?
- How do we ensure small communities are served as well as larger ones?
- How do we ensure watershed protection is adequately considered in municipal planning?
- How do we ensure science is linked to policy?



# Thank you

Walkerton:

Investigative report

[www.publichealthgreybruce.on.ca](http://www.publichealthgreybruce.on.ca)

[www.walkertoninquiry.com](http://www.walkertoninquiry.com)

North Battleford:

Epidemiological report

[www.health.gov.sk.ca](http://www.health.gov.sk.ca)

[www.northbattlefordwaterinquiry.ca](http://www.northbattlefordwaterinquiry.ca)