The Challenges of Environmental Surveillance

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at the meeting of New Brunswick Environmental Network

'Children Count'

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What is Health Surveillance?

- Surveillance has a long tradition in Public Health enabling description of disease and provision of insight into disease causation and control.

- Surveillance system is defined as a coordinated sequence of activities among one or more organizations designed to monitor a disease or diseases and their risk factors, determinants or preventive interventions, in the most effective and efficient means possible.

Health Surveillance

- Involves collection of data over the long term
  - through the continuous collection of high-quality data,
  - creation of surveillance products such as reports, advisories, warnings (integration, analysis and interpretation)
  - and timely distribution of those surveillance products to those who need to know.

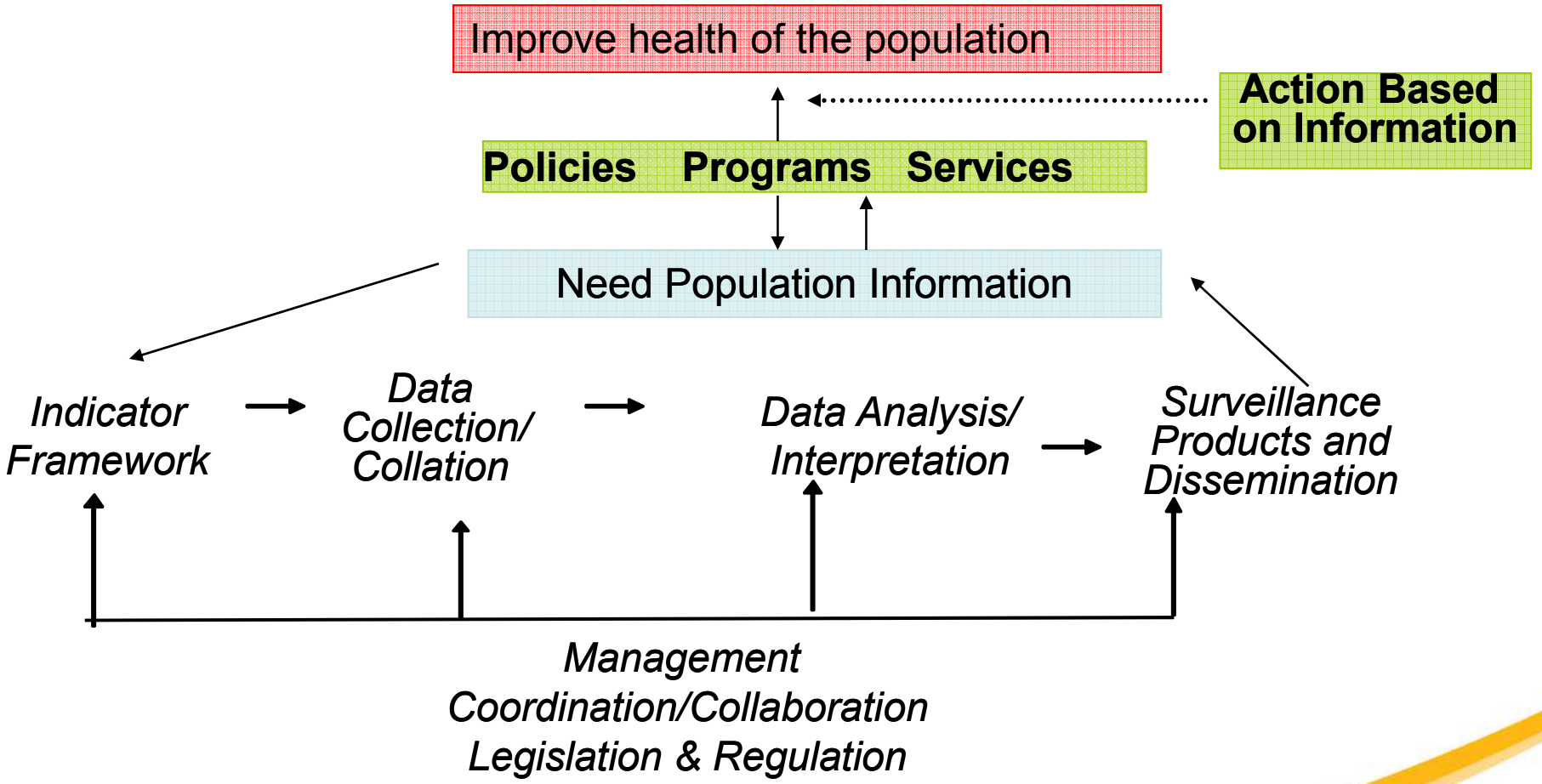
Health Surveillance

- Information for Action
  - Surveillance products are produced for a specific public health purpose that is linked to public health practice

A health surveillance system includes:

- Indicator framework;
- data collection/collation;
- data analysis and interpretation;
- surveillance products and dissemination;
- use of information;
- management;
- coordination/collaboration; and
- legislation and regulation.

IDEAL SURVEILLANCE SYSTEM



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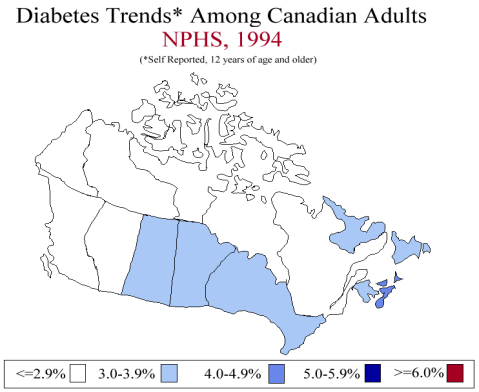
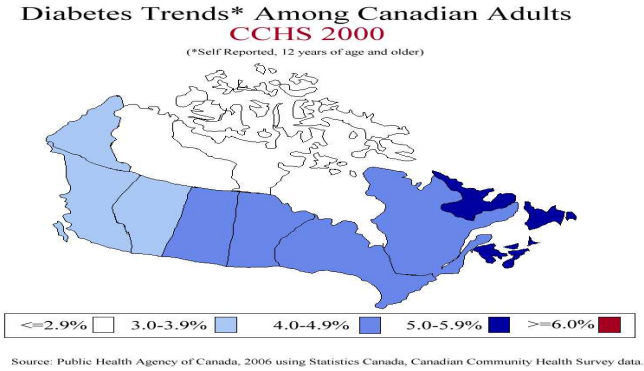
Purposes of Public Health Surveillance

- ***Assess public health status*** - Plan health services
  - Monitor trends
  - Clusters of risk factors/determinants, emerging issues
  - ***Define public health priorities*** - tailor policies and programs
- ***Monitoring events-*** for rapid response
- ***Evaluate programs*** - Evaluate policies, programs and services
- ***Stimulate research*** -Points to research questions

Example: Diabetes trends among Canadian adults



Source: Public Health Agency of Canada, 2006 using Statistics Canada, National Population Health Survey data.
Note: Northern Territory data not available.



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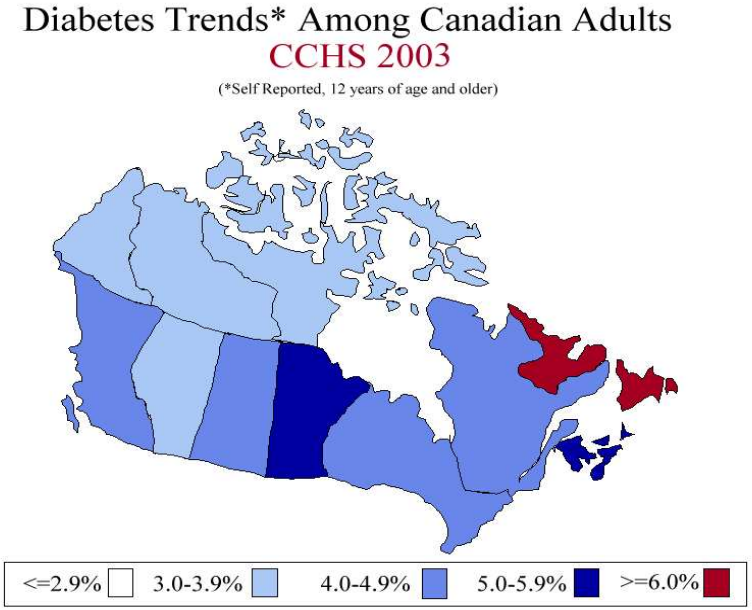

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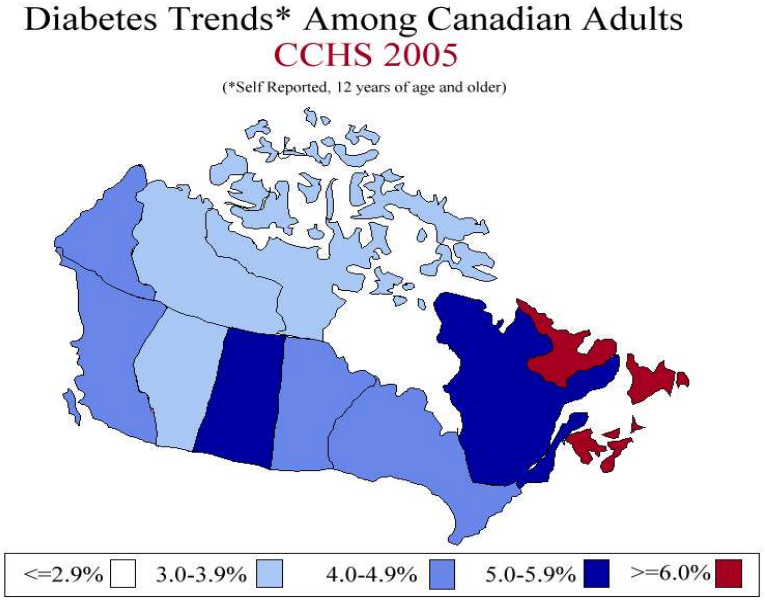

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Example of Existing Surveillance System in NB: Campylobacter

- Campylobacteriosis is a bacterial disease which attacks the digestive system.
  - A person becomes infected by eating undercooked chicken or pork, or drinking contaminated water, raw milk or from close contact with infected puppies and kittens, farm animals or infected infants.
  - Symptoms include: diarrhea, abdominal pain, malaise, fever, nausea and vomiting.

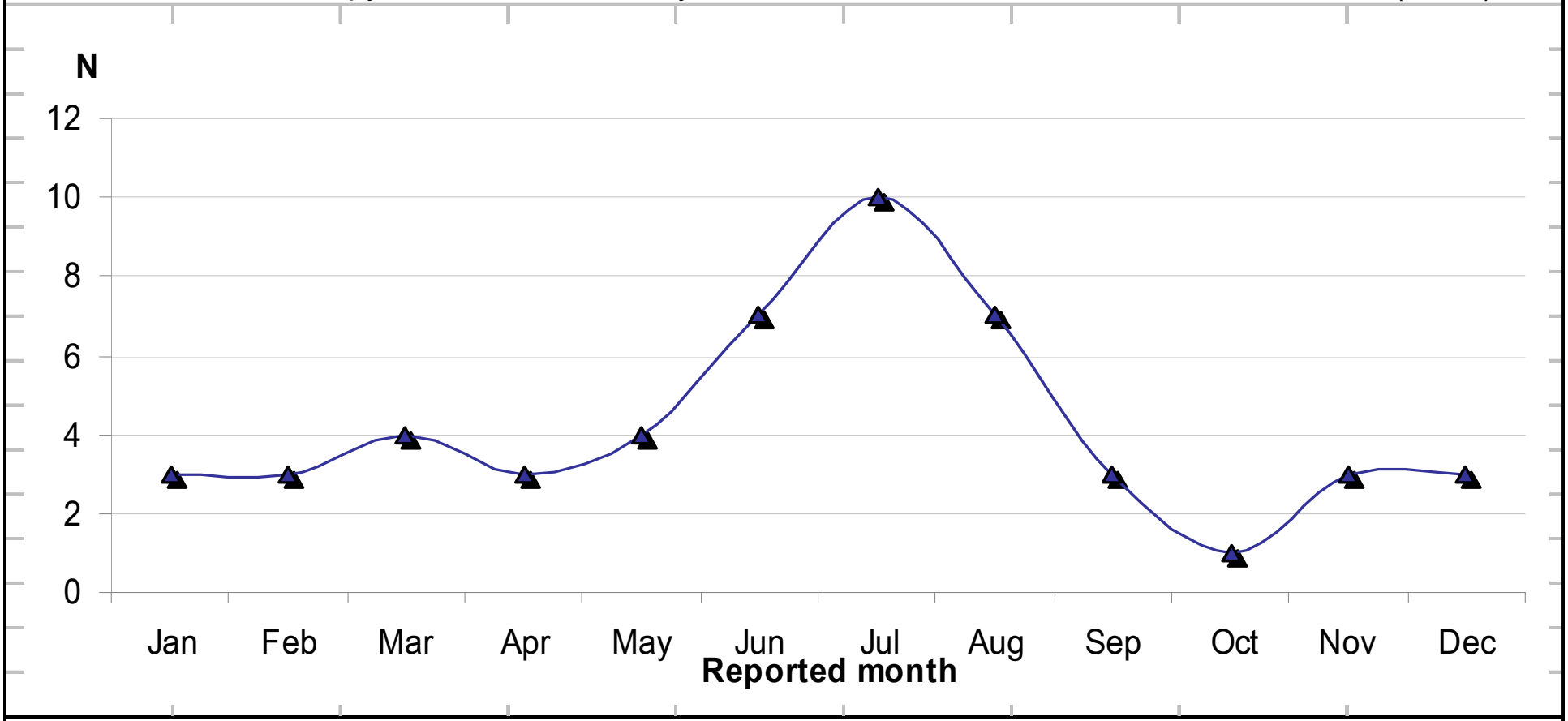
- Campylobacter is one of 64 reportable diseases under the Public Health Act.
  - Campylobacter is reported to the Public Health Dept by PH laboratories in NB.

- Once reported, public health inspectors immediately contact the case to determine:
  - How/ where that person would have contracted the illness- through food, water, at a camp, daycare, travel etc.
  - If there are any contacts.
  - If food is identified, and a sample of food is available, the lab can test the food and identify with certainty that it is the cause of the illness.

Example: Campylobacter in Children in NB 2009

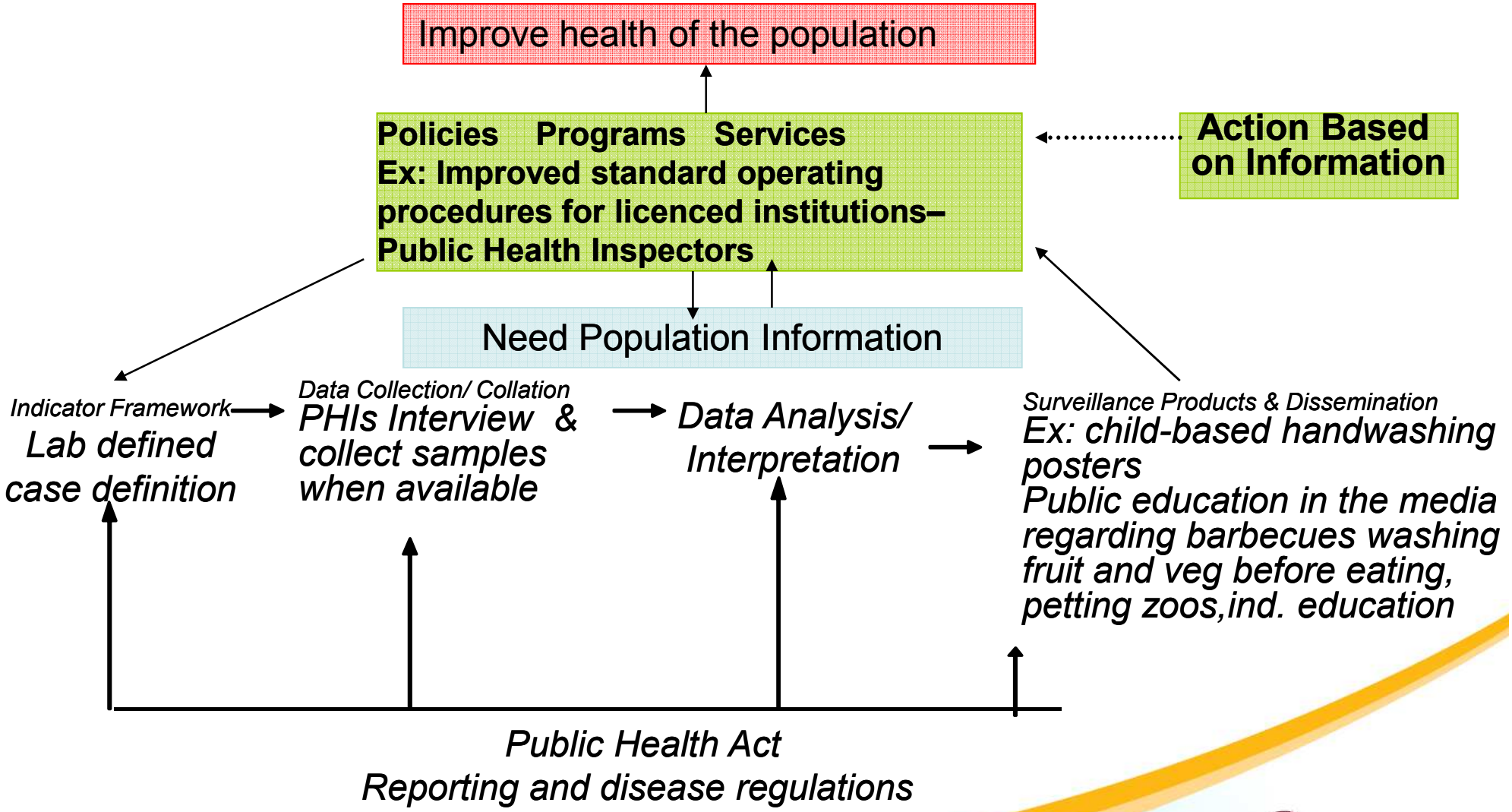
Graphic 1.

Number of cases of campylobacteriosis, 0 to 19 years old, Province of new-Brunswick, 2009-2009 (N=51)



Source : Enteric, Food and Waterborne Diseases database, OCMOH office, extraction realized on jan 13, 2010

IDEAL SURVEILLANCE SYSTEM



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Environmental Public Health Tracking

Hazard

Exposure

Health Effect

Data

Ongoing Evaluation

COLLECTION → INTEGRATION → ANALYSIS → INTERPRETATION

Tracking Network

Dissemination

Assessment • Research • Intervention • Policy

Stakeholders*

Prevention

Improved Public Health

Ongoing Evaluation

*Stakeholders Include	
Federal Agencies	Business and Industry
State and Local Agencies	Policy Makers
Academia	Media
Health Care System	Public
Non-Governmental Organizations	

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION
SAFER • HEALTHIER • PEOPLE

CDC
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Environmental Public Health Tracking

- Presence of a hazard does not necessarily mean that there is exposure.
- Hazards are in a variety of types and forms capable of polluting but do they result in adverse health effects?
- Exposure may occur through air, water, soil and therefore be taken into the body by direct and indirect contact, respiration, food and drinking water.
- Chronic diseases such as asthma or cancer which present slowly over a long period of time make it very difficult to specifically determine the primary exposure.
- Chronic diseases have many risk factors: including diet, physical activity, use of tobacco etc.
- Few confirmed, causal links between environmental exposure and health effects .
- There are many associations made between environmental exposure and adverse health effects but causality has not been determined.

Challenges in Health Surveillance

- What to collect? – Health outcomes and/or exposure
  - Cases: chronic diseases such as asthma. chronic diseases are generally irreversible, cannot estimate date of onset but could be useful in estimating disease due to environmental exposure.
    - There is presently no registry for chronic diseases asthma cases, could at look at child presenting at hospital. Not every asthmatic child presents at hospital….calls into question quality of the data.
  - Exposure: good data can prevent potential health effects, for eg, NB collects drinking water monitoring data in all municipal water systems and schools.

Challenges in Health Surveillance

- CASE DEFINITION:
  - Children with ADHD may never present at hospital- how are they diagnosed?
  - Although there is a definition and tests to confirm, many ADHD cases are reported by a variety of sources without such tests
  - How can one be sure that conduct disorder cases such as ADHD are representative in NB without defining the portal for collection of cases?

Challenges in Health surveillance

- Risk factor- determinants
  - Chronic diseases such as cancer, asthma, ADHD have many risk factors and potential exposures, they all have to be collected.
  - The new Public Health Act has the capacity to mandate the collection of env health and exposure data many questions have to be answered.
  - In the case of cancer, strategies for the prevention of new cases of cancer may include changes in environmental factors as well as behavioral factors.

Summary

Collection of good quality data or information to link hazards and exposure is essential.

This information can be analyzed and interpreted to allow the design of appropriate intervention strategies.

This can then be applied to policies which can meet the goals of improving public health.