

# **National Consensus Conference on Foodborne, Waterborne and Enteric Disease Surveillance**

## **Summary of Proceedings**

November 28-30, 1995  
Citadel Hotel and Convention Centre  
Ottawa, Ontario

Laboratory Centre for Disease Control  
Health Protection Branch  
Health Canada

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# Executive Summary

This report summarizes the proceedings and recommendations of a National Consensus Conference on Foodborne, Waterborne and Enteric Disease Surveillance, held at the Citadel Hotel and Convention Centre in Ottawa, November 28-30, 1995. The Consensus Conference, sponsored by the Bureau of Infectious Diseases, Laboratory Centre for Disease Control (LCDC), Health Protection Branch, Health Canada, was designed to obtain consensus amongst experts and representative stakeholders from across Canada on directions for national surveillance systems and activities related to foodborne, waterborne and enteric diseases, and related risk factors.

The Consensus Conference was attended by some 70 participants spanning a broad range of relevant interests from all levels of government, academic and research institutions, industry and public interest organizations concerned with health issues. Formal presentations by invited experts from Canada, the United States of America and Europe were followed by a series of working group and plenary sessions addressing the following questions and issues:

- The *objectives* of foodborne, waterborne and enteric disease surveillance, at national, regional and local levels.
- The most critical factors affecting the *timeliness and usefulness* of surveillance data and analysis; *ideal timelines* for data collection, analysis and dissemination.
- *Mechanisms to coordinate* Canadian foodborne, waterborne and enteric disease surveillance activities.
- Priority topics for *targeted special studies* related to foodborne, waterborne and enteric disease surveillance.
- *Organisms and microbial toxins* that should be tested for, as part of a national surveillance strategy.
- *Minimum data* that should accompany laboratory-confirmed isolates in reports to national reference laboratories.
- Approaches to *harmonization of laboratory methods* and quality assurance programs.
- *Gaps in data collection and transmission* in Canada.
- *Incentives and mechanisms* to promote collection and transmission of required data.
- Issues related to *patient and proprietary confidentiality* affecting access to or use of surveillance data.
- *Compatibility of software* for surveillance networks across Canada.
- *Required analysis and aggregation of surveillance data*, including roles and responsibilities.
- *Content and format of dissemination products* and vehicles for surveillance data.
- Methods to enhance *access to surveillance data*.
- Required surveillance data on *determinants and outcomes* of foodborne, waterborne and enteric diseases.
- Requirements for *national notification of disease outbreaks* by selected pathogens.



- Requirements for *nationally-uniform protocols for investigation of disease outbreaks*.

Participants reached consensus on virtually all issues addressed, albeit with varying levels of detail (reflecting the state of the art related to foodborne, waterborne and enteric disease surveillance). In total, some 65 recommendations were advanced. Most notably, the Conference endorsed the immediate establishment of a National Advisory Committee with broad representation of experts and stakeholders to spearhead further development of key elements of a national foodborne, waterborne and enteric disease surveillance strategy. Many of the recommendations focused on specific tasks that might be assigned to that group for further examination and development. Participants also advocated the broadening of the scope of diseases and pathogens included in a more cohesive surveillance system that would perhaps address all foodborne and waterborne diseases and risk factors (i.e., rather than just the infectious and enteric diseases initially proposed).

Participants indicated a willingness to continue cooperation on the development

and strengthening of Canada's foodborne, waterborne and enteric disease surveillance systems and related support initiatives.

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# I . Introduction

## *Purpose of Conference*

The Conference was sponsored by the Bureau of Infectious Diseases, Laboratory Centre for Disease Control (LCDC), Health Protection Branch, (HPB), Health Canada. Planning of the agenda, format and contents, and invitation of participants was carried out by a Planning Committee with representatives from Health Canada, Agriculture and Agri-Food Canada (AAFC) and two provincial Ministries of Health. (See *Appendix 1: Planning Committee Members.*)

The objectives of the Conference were to *obtain a national consensus on the requirements for a Canadian surveillance system for food-borne, waterborne and enteric diseases and related conditions, identify weaknesses in the existing surveillance system and develop a prioritized list of areas for its improvement.* The results of this Conference will be used as a basis for the development of a more cohesive, coordinated and effective foodborne, waterborne and enteric disease surveillance system in Canada.

The goal of such a surveillance system should be the anticipation, control and prevention of human foodborne, waterborne and enteric disease, particularly through rapid detection and control of problems when they occur. In addition to surveillance and monitoring of human disease cases, the Conference addressed surveillance of contaminated foods and water, contamination of other potential vehicles of enteric disease transmission and animal reservoirs of foodborne and enteric disease agents, to the extent that these are determinants of human illness.

## *Participants*

The Conference gathered experts from a wide range of international, national/federal, provincial/territorial, and local and regional bodies in an attempt to garner a broad base of both expertise and consensus: epidemiologists, academics, medical officers, strategic planners/risk managers, public health inspectors, community medicine specialists, etc. The interests represented covered agriculture and food, fisheries, and water as well as public health. (See *Appendix 2: Participants.*) Representatives of existing foreign-based surveillance systems, from the U.K., the U.S. and Europe complemented the Canadian contingent, thereby providing a wealth of insights and experiences from different jurisdictions.

## *Agenda*

The following summary of proceedings outlines the sequence and scope of activities. (See *Appendix 3: Agenda.*)

### ► **Tuesday, November 28, 1995 (Day 1):**

The first day set the context for the Conference. The international speakers, as well as the four representatives of the current Canadian Surveillance System, used their examples and experiences with their surveillance systems to provide some points of reference for the afternoon's first Working Group Sessions. (See *Appendix 4: Working Groups.*)

### ► **Wednesday, November 29, 1995 (Day 2):**

Presentations were made by Chairpersons/Rapporteurs for each Working Group based

on the working drafts of recommendations to be made on their respective issues from Day 1. Reaction to the proposals was solicited from the plenary. In the afternoon, the Working Groups reconvened to incorporate new ideas and fine-tune their recommendations.

- **Thursday, November 30, 1995 (Day 3):** Presentations were again made by the Working Group's Chairpersons/Rapporteurs. Following each presentation a comprehensive refining of the meaning, scope, context and, to a certain degree, wording, of the specific recommendations of each working group was undertaken in

an effort to gain consensus amongst the participants. As it turned out, consensus — defined by Conference Planning Committee Chair, Dr. Jeff Wilson, as “recommendations that most participants (say 70-80%) *“agree on”* and the rest can *“live with”* — was achieved on virtually all items. However, due to some time constraints it was agreed that the final wordings of the recommendations were to be disseminated to and reviewed by the Conference Chair, the Chairs and Rapporteurs of each Working Group, and the members of the Planning Committee before the final report is published.

## II. Keynote Presentations

### *Opening Remarks*

**Dr. Monique Douville-Fradet**, Chairperson of the Conference, called the meeting to order, emphasizing the significance of this National Conference on Foodborne, Waterborne and Enteric Disease Surveillance, and how it will guide development of Canada's surveillance systems over the next several years.

**Mr. Kent R. Foster**, Assistant Deputy Minister, Health Protection Branch (HPB) of Health Canada, welcomed the international guests and emphasized the "risk management philosophy" of HPB and its support of, and commitment to, the efforts made by those in attendance toward devising an action plan to "re-engineer national surveillance and monitoring activities for infectious foodborne, waterborne and enteric diseases."

**Dr. Jeff Wilson**, Chair of the Conference Planning Committee stressed both the objectives of the Conference and the importance of achieving consensus on key conclusions and recommendations, to provide clear direction for future system improvements to support surveillance efforts at the international, national, provincial/territorial and local levels.

### *Formal Presentations*

**Mr. Ian Fisher**, of the Communicable Disease Surveillance Centre, Public Health Laboratory Service, in the United Kingdom, outlined the background, objectives and progress to date in the development of the European "SALM-

NET" Information System. The SALMNET project began in 1994 as an International Laboratory based SALMonella surveillance NETwork, hence "SALMNET." Its goal is to assist in the prevention and control of human salmonellosis in Europe, highlighting three main areas for development and harmonization: microbiological, epidemiological, and outbreak investigation/early warning system. It stands as a working example of how a database of information, linked through the Public Health Laboratory Service (PHLS), can provide an important scientific network providing scientific data and advice upon which proper authorities may act. (See Appendix 5.)

**Professor Klaus Gerigk**, Former Director of the World Health Organization (WHO) Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe,\* reviewed the history and activities of this program. The programme began in 1980 with eight member countries. Its goal is to facilitate the flow of information on foodborne diseases amongst national and international sources. The Programme is non-mandatory and based on surveillance activities at the national level. Each country has designated a national contact point to provide official data and other information relevant for the prevention and control of foodborne disease, ideally, through a standardized reporting form. The Berlin FAO/WHO Collaborating Centre for Training and Research in Food Hygiene and Zoonoses acts as managerial centre for this programme. It compiles and distributes to participant countries and those interested,

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\* Managed by the Collaborating Centre for Training and Research in Food Hygiene and Zoonoses, based in Berlin.

annual reports, which include all of the national data; and, it is the contact point for the Programme's Early Warning System, by which important foodborne disease outbreak information is disseminated to official national agencies responsible for food and/or disease control. (See *Appendix 6*.)

**Dr. Nancy Bean**, Chief, Surveillance and Epidemic Investigation Section, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention (CDC), highlighted some features of a new **United States surveillance system**. Global expansion of technological capabilities has provided new opportunities for communicable disease surveillance, with regard to access and feedback. The three key components of the American surveillance system are the Public Health Laboratory Information System (PHLIS), a PC-based electronic reporting system; Outbreak Detection, a weekly assimilation of data from laboratories which leads to detection of possible outbreaks and the notification of state epidemiologists; and the Laboratory Information Tracking System (LITS), also a PC-based database but one designed for laboratories that is highlighted by its ability to be customized to each laboratory specifically. Collectively, they provide a "pyramid-style" reporting system — data analysis and feedback exchange can happen at all levels — that facilitates surveillance for potential outbreaks of various pathogens. The same data and database systems are shared by laboratories and epidemiologists, at local state and federal levels, resulting in a surveillance system that is highlighted by data ownership, rapid response, rapid analysis, feedback, and outbreak detection. (See *Appendix 7*.)

**Dr. Paul Sockett**, Chief, Division of Surveillance, Bureau of Infectious Diseases, Laboratory Centre for Disease Control, HPB, Health Canada, shared insights from his professional experience with foodborne disease surveillance in the United Kingdom. Dr. Sockett pointed to two key factors in the development of the **United Kingdom's surveillance system**: the formation of the Public Health Laboratory

Information System at the beginning of the Second World War, and the government response to the increase in *Salmonella* reporting associated with contaminated eggs in 1987. The first factor led to the formation of the Epidemiology Research Laboratory which developed into a new Communicable Diseases Surveillance Centre (CDSC) and sustains a national centre responsible for maintaining national databases on infectious diseases founded on the laboratory reporting system and providing advice based on findings, investigations of outbreaks, and training. The second factor led to the formation of ACMSF, a panel of experts who meet at regular intervals to review national data on foodborne, waterborne, and other gastro-intestinal diseases, and advise government. This system has played an important and essential role in identifying and limiting outbreaks, improving government standards in these areas, and in developing both professional and public education materials. (See *Appendix 8*.)

**Dr. Ewen Todd**, Head, Contaminated Foods, Bureau of Microbial Hazards, Food Directorate, HPB, Health Canada, provided an overview of **Canada's Foodborne Disease Reporting Centre**. He began by highlighting the necessary components for an effective food safety program, and indicated that while all of these factors currently exist within HPB and at provincial/territorial and local levels, they are not necessarily coordinated: the investigation of foodborne disease incidents; laboratory analyses of foods and clinical specimens, indicator organisms and contaminants; regular inspections of foods and the food production chain; and, appropriate legislation and educational programs for preventing foodborne disease. In addition, not all reports of foodborne outbreaks generated at local, provincial/territorial or federal departmental levels are widely disseminated or published. Dr. Todd concluded that the timeliness, the mode of distribution, and the amount of resources and their coordination within the Canadian surveillance system can and should be improved. (See *Appendix 9*.)

**Dr. Wendy Johnson**, Chief, National Laboratory for Bacteriology and Enteric Pathogens, Bureau of Microbiology, HPB, Health Canada, shared insights on **Canada's National Laboratory-based Surveillance** as it relates to foodborne and enteric diseases. This surveillance activity is highlighted by regular transmission of data from provincial laboratories, and outbreak investigation support — reference services nationally and internationally. The National Laboratory is in the process of introducing PHLIS. (See *Appendix 10*.)

**Dr. Trevor Williams**, Laboratory Director, Cadham Provincial Laboratory, Manitoba Health, provided information on a provincial laboratory system by describing the system in Manitoba. Noting that the key imperatives in any surveillance system are the existence of investigative links and established information channels that can funnel data quickly back to the proper health authorities, Dr. Williams highlighted the numerous levels at which alerts could be sounded regarding outbreaks and the various testing mechanisms available at these levels for collecting clinical data. (See *Appendix 11*.)

**Mr. William Robertson**, Microbiology Advisor, Monitoring and Criteria Division, Environmental Health Directorate, HPB, Health Canada, outlined the features of **Canada's National Surveillance System of Waterborne Disease**. Under the current system, episodes of waterborne disease in Canada are brought

to the attention of Health Canada through a passive reporting system. Outbreaks and single cases are reported in the *Annual Summaries — Foodborne and Waterborne Disease* (1987 most recent year published). There are concerns regarding the need for a more timely disease outbreak communication system. For example, a unique feature of drinking water is the presence of potentially carcinogenic disinfection byproducts. As a result there is mounting pressure in developed nations to reduce the use of disinfectants in the treatment of drinking water. Although this might reduce the incidence of cancer it could produce significant increases in the incidence of waterborne disease outbreaks. For this reason timely information on the incidence of waterborne disease (and associated health costs) is essential for comparison with the possible health impacts of disinfection byproducts. To these ends, last winter, the Environmental Health Directorate commissioned the Canadian Public Health Association to carry out a survey of public health and environmental health officials on the need and feasibility of an active national surveillance system of waterborne disease in Canada. The objectives of the survey were to assess the existing provincial and territorial systems for surveillance of waterborne disease; identify if there is a need to develop a national waterborne surveillance system; and, if so, to identify its mandate, scope and structure; and discuss the feasibility of such a national system. (See *Appendix 12*.)

# III. Working Group 1

## Objectives, Timeliness and Critical Data Required for a National Foodborne, Waterborne and Enteric Disease Surveillance System

**Question 1:** *What should be the primary objectives of foodborne, waterborne and enteric disease surveillance at the local, provincial/territorial and national levels of government?*

### Discussion

Public health surveillance is defined as the ongoing, systematic collection, analysis and interpretation of selected health-related data, closely integrated with the timely dissemination of these data to those who need to know.

In general, there are legitimate interests and responsibilities related to foodborne and waterborne disease (and related risk factors) at all levels. These are not restricted to governments, but include industry (food and water production/preparation, retailing, and service establishments) and consumers. There can be no neat “pigeon-holing” of these interests and responsibilities at each level. The landscape is considerably complicated, with considerable overlap and interplay amongst the various actors and sectors.

Any differences in the *particular* interests and objectives of actors at the local, provincial/territorial and national levels, tend to reflect such factors as:

- jurisdiction and mandate

- relative expertise (e.g., capabilities of local vs. provincial/territorial and federal/national labs)
- relative urgency and severity of a particular case/outbreak or risk situation
- the allocation of available resources for reasons of efficiency and cost-effectiveness
- the position/capacity of various levels to see/respond to broader and longer-term patterns, interjurisdictional comparisons and trends, etc.

Without pretending to be absolute or definitive, there is a general “*gradient*” from local up through provincial/territorial interests/objectives to the federal/national level, as follows:

Generally, *local-level* interests and objectives tend to focus on the following:

- first detection and first response
- ultimate responsibility for prevention and control
- individual people, individual groups, individual establishments
- site- and group-specific
- inspections
- local food outlets and establishments
- local water supplies and recreation facilities
- rapid response vital *and* possible



Generally, *provincial/territorial-level* interests and objectives tend to focus on the following:

- intraprovincial issues (i.e., across several municipal jurisdictions)
- interprovincial issues
- broader system and environmental factors (e.g., general food and water industry issues, watershed issues, etc.)
- sophisticated provincial/territorial laboratory services (i.e., that cannot be practically carried out by local labs)

Generally, *federal/national-level* interests and objectives tend to focus on:

- general health of Canadians (i.e., population as a whole)
- integrity and safety of food systems
- integrity and safety of water supplies
- interprovincial and international issues (including transboundary risks, import-export and interprovincial trade and population movement, etc.)
- sophisticated laboratory services and other expertise
- capacity to see broader patterns and trends, esp. trend analyses and interprovincial and international comparisons

## Recommendations

### R1.

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*Surveillance systems and activities should be designed and managed so as to provide relevant decision-makers, including governments, industry and consumers, with timely, relevant and reliable information that enables them to anticipate, detect, control and prevent acute microbial foodborne, waterborne and enteric (and related) diseases (see Appendix 13 for list of diseases that, as a minimum, should be potential candidates for inclusion in any foodborne, waterborne and enteric surveillance programme; other relevant diseases, i.e., with comparable vectors, risk factors, etc., might also be added as appropriate). This list of dis-*

*eases should be reviewed by an appropriate set of stakeholders in other related fields to consider broadening the scope to cover all foodborne and waterborne etiologic agents (e.g., chemicals). Surveillance would encompass the following, as appropriate (i.e., for selected diseases, pathogens, interventions and risk factors):*

- detection and characterization of cases and outbreaks of waterborne and foodborne diseases, including detection of emerging diseases and pathogens;
- assessment of the effectiveness and impacts of prevention and control interventions; and
- identification and assessment of risks including food production, handling, preparation and consumption; water treatment, handling, preparation and consumption; and relevant risk factors, behaviours and exposures.

### R2.

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*Surveillance systems and activities should be designed and managed so as to proactively trigger and guide the most appropriate and cost-effective prevention and control responses to relevant cases, outbreaks and risk situations, including, stimulation of, and input to:*

- policies and practices (e.g., food and water handling, hygiene, consumer behaviour, etc.)
- priority-setting (e.g., for public health activities)
- risk management strategies
- public health education and information
- further research and/or special studies

### R3.

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*The design and management of surveillance systems and activities for foodborne and waterborne and related diseases should be based on the following guiding principles, so as to be as relevant and cost-effective as possible:*

- demonstrable and meaningful contribution to prevention and control strategies/activities
- an appropriate balance of active and passive systems as well as informal and formal methods/networks
- requisite quality and timeliness of data collection, analysis and interpretation, and dissemination
- effective adaptation, development, integration and utilization of existing systems
- high degree of selectivity, focusing on the highest priority diseases and risk factors (i.e., those with greatest risk and burden, and the greatest potential for prevention and control)
- selection of the most appropriate data sources and surveillance methods, including effective utilization of relevant data from laboratories, physicians, hospitals, clinics, food and water inspection systems, population surveys, etc.

#### R4.

*In recognition of the complexity and interplay of interests, and of the various complementary factors and objectives of the different actors at the local, provincial/territorial, national and international levels, special emphasis must be placed on the fostering of effective formal networks as well as informal working relationships amongst all stakeholders, so as to ensure a high degree of collaboration, cooperation and sharing of data and analyses.*

**Question 2:** *What are the points in the Canadian foodborne, waterborne and enteric disease surveillance system for which timeliness of data collection, transmission, analysis, interpretation and/or dissemination significantly limits the effectiveness of the system?*

## Discussion

Each step in the process, by definition, introduces some degree of delay in getting surveillance data and findings into the hands of relevant decision-makers for action. The specific causes and the lengths of such delays vary from one agency and jurisdiction to another, and also from one disease or risk factor to another. Moreover, the relative significance of any delays or lags in the surveillance process will vary from one case/outbreak to another. Any improvement in the timeliness of delivery of surveillance data and findings can only enhance the effectiveness and usefulness of the surveillance activity itself.

## Recommendations

### R5.

*The surveillance system should be systematically reviewed to identify and pursue any practical measures that would enhance the timeliness of data collection, analysis and interpretation and dissemination, wherever this will improve the ability to anticipate, control and prevent disease. In so doing, consideration should be given to the following potential measures:*

- ensuring one-time data entry, to the extent possible/practical
- positioning/promoting disease surveillance as an integral byproduct of case management at the local level (supported by disease control “action tools”, e.g., that provide ready instructions for data capture and reporting procedures)
- clearly defining the most essential data required (so as to minimize/avoid capture and processing of irrelevant or marginally useful data)
- establishing standardized reporting procedures and formats
- utilizing multi-dissemination strategies (i.e., rather than linear, sequential)
- establishing protocols and mechanisms to allow fast-track reporting under specified

conditions/criteria (e.g., certain serious or unknown/potentially exotic diseases or pathogens, high-risk situations, etc.)

- using procedures that allow immediate dissemination of basic data/findings even while additional data and analyses are being added to the case record (i.e., early dissemination of “first alert” data, prior to completion of case analysis/outbreak investigation)
- establishing and maintaining effective networks amongst all key players in the surveillance system (to enable and encourage rapid sharing of data and findings)
- promoting use of positive incentives to encourage and reinforce the timely capture, analysis and dissemination of surveillance data, including a commitment to open access to and ready sharing of data amongst partners in the system
- utilizing a full range of technologies, from informal telephone contacts to fax and electronic dissemination, and on-line computer access wherever practical
- enhancing the analytic skills of participants in the system, to enable them to detect and characterize cases/outbreaks and risk situations in a more timely fashion
- establishing a computer system that allows easy access to, and addition of, surveillance data, including “early-warning” data from local levels (i.e., in the fashion of major airline booking systems, with 1-800 access)
- providing better education of the public and physicians to ensure that they seek diagnosis and, as appropriate, report relevant conditions near onset of disease

**Question 3:** *Should the appropriate timelines for the collection, analysis and dissemination of foodborne, waterborne and enteric disease surveillance data in Canada be defined as specifically as possible?*

## **Discussion**

The relative urgency of surveillance activities varies considerably amongst the various diseases, pathogens and risk factors — some of which are more serious, rapid and volatile than others. Also, the use of the data — whether for immediate investigation and control purposes or longer term prevention, research or evaluation — also affects the relative urgency of data collection, analysis and dissemination.

The timelines for surveillance activities must be linked to the ability to prevent or control the disease or outbreak. This varies with the etiologic agent. It also varies with the age group affected, the setting, severity, public health importance and level of political awareness and public interest.

## **Recommendations**

### **R6.**

*In redesigning and strengthening the surveillance system, consideration should be given to the establishment of broad guidelines that would indicate the desirable timeframes within which the various surveillance activities (data collection, interpretation and analysis, and disseminations of results) should be undertaken. These timeframes should take into account:*

- the relative nature and urgency of the situation (disease, pathogen, risk factor); and
- the purposes for which the surveillance findings are being used, at the local, provincial/territorial, national and international levels

## IV. Working Group 2

### Coordination of a National Strategy for Foodborne, Waterborne and Enteric Disease Surveillance and Related Special Studies

**Question 1:** *Should a national body be created for the coordination of the Canadian foodborne, waterborne and enteric disease surveillance system?*

#### **Discussion**

There is a strong need, and support, for some form of expert advisory group that can provide leadership and direction in the coordinated development and enhancement of national foodborne, waterborne and enteric disease surveillance systems and capabilities, including periodic setting of priorities and objectives for surveillance work in response to emerging issues and conditions.

#### **Recommendations**

##### **R7.**

*LCDC should create a national expert advisory committee with a broad, multi-disciplinary membership with an appropriate balance and mix of different professional disciplines and well-balanced membership providing representation from local, provincial/territorial and national/international levels. This committee should include members representing the following disciplines and/or key stakeholder groups and institutions:*

- All federal departments that deal with food and water (Agriculture and Agri-Food

Canada, Fisheries and Oceans, Health Canada and Environment Canada)

- Epidemiology — representatives from the (Federal-Provincial-Territorial) Advisory Committee on Epidemiology (ACE)
- Laboratories — representatives from or appointed by the Technical Advisory Committee (TAC), plus, as appropriate, a local laboratory representative
- Public Health Practitioners — representatives with front-line experience
- A laboratory expert in food microbiology
- Federal-Provincial Expert Committee on Food Safety (ECOFS)
- Inter Agency Council on Food Safety (Ontario) (ICFS)
- Canadian Public Health Association
- Provincial/Territorial Ministry(ies) of Health — representatives to provide regional perspectives
- Canadian Institute of Public Health Inspectors
- Canadian Food Inspection System Integration Group
- Committee on Environmental and Occupational Health (CEOH)
- Canadian Hospital Infection Control Association (CHICA)
- Canadian Medical Association

- Canadian Water and Wastewater Association and/or Canadian Bottled Water Association
- Other stakeholders and resource people (either represented on Committee, or available for consultation and advice on relevant issues and initiatives), e.g.,
  - Risk Assessment Specialist
  - Canadian Restaurant Association
  - Informatics Specialist
  - First Nations
  - National Defence

#### R8.

*The proposed National Advisory Committee (see R7. above) should be granted the mandate to:*

- recommend the structure of a national surveillance system for foodborne, waterborne and enteric disease
- propose ways to improve communication, coordination and priority-setting mechanisms
- facilitate improved surveillance activities and strategies
- recommend appropriate and uniform guidelines to assist in surveillance goals (e.g., lab methods, reporting)
- design common uniform information and reports
- establish minimum consistent data requirements
- promote development and strengthening of formal and informal networks
- integrate a national dataset accessible to all
- provide an effective feedback mechanism
- recommend a communication strategy
- advise on areas for targeted special studies
- promote the evaluation and assessment of surveillance outcomes (i.e., the uses and benefits of surveillance activities)

#### R9.

*The proposed National Advisory Committee (see R7. above) should be established by April 1, 1996, with initial funding from LCDC. Frequency of meetings will be greatest in initial stages of start-up and development work, and less frequent thereafter as the work shifts to periodic improvements; the committee would be dissolved if/when no longer required.*

**Question 2:** *Should a national body be formed to provide advice on areas for targeted special studies suggested by foodborne, waterborne and enteric disease surveillance data?*

#### Discussion

There is no need for a separate body to advise on specific studies or applied research related to surveillance activities and findings, as this function can be readily incorporated in the mandate of the proposed National Advisory Committee (see R7. above).

#### Recommendations

None

**Question 3:** *In order of importance, what are the 10 most important subjects for targeted special population-based studies related to foodborne, waterborne and enteric disease in Canada today?*

#### Recommendations

#### R10.

*The special studies should focus on developing a better understanding of:*

- Incidence/Prevalence
- Determinants/Risk Assessment

- Economic Burden/Cost Benefit
- Cost-Effective Intervention strategies

The interim list of topics for special studies listed in Table 1 (*in no particular order of priority*) should be considered by the proposed National Advisory Committee (see R7. above) in developing priorities.

#### R11.

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*The proposed National Advisory Committee (see R7. above) should advise on the nature and priority of special studies to be pursued of direct interest to government organizations with responsibilities related to foodborne, waterborne and enteric disease, using the following parameters and criteria to assist in their ranking:*

- Incidence
- Extent to which enteric diseases are transmitted through food and/or water

- Morbidity
- Deaths
- Deaths-to-case ratio
- Communicability
- Potential for outbreaks
- Public perception of risk/importance
- Socioeconomic impact
- Public Health intervention feasible
- Emerging Disease issue
- Lack of knowledge
- Basic scientific interest
- International/transboundary scope and importance

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\* Modified from "Establishing Goals, Techniques and Priorities for National Communicable Disease Surveillance," *Canada Diseases Weekly Report*, Volume 17-16, April 20, 1991, p. 79.

**Table 1.**

**Interim List of Candidate Topics for Special Studies**  
(in no particular order of priority)

Organism or Special Subject	Rationale
Surveillance System	Establish cost-effectiveness
<i>Campylobacter</i> spp.	Risk factors, disease burden, Guillain-Barré Syndrome, cost of disease
<i>Giardia lamblia</i>	Prevalence in population and drinking water, baseline studies
Verotoxin-producing <i>Escherichia coli</i> (VTEC)	Non-O157, O157, unknown disease associations and sequelae of infections, risk factors for acquisition
Norwalk and other small, round, structured viruses	Emerging, unknown prevalence and diagnostic limitations (rapid methods for detection in water)
<i>Salmonella</i> spp.	Studies to ensure safety of food supply as required if routine surveillance indicates change in baseline data
<i>Cryptosporidium</i>	Prevalence in population and drinking water, baseline studies
Emerging Pathogens — <i>Aeromonas hydrophila</i> , <i>Yersinia enterocolitica</i> , <i>Blastocystis hominis</i> , <i>Helicobacter pylori</i> , <i>Mycobacterium paratuberculosis</i>	Determining the extent to which these are transmitted via food and/or water
Antibiotic-Resistant Enteric Bacterial Pathogens — <i>Salmonella</i> spp.	Monitoring the extent of antibiotic resistance relative to animal sources and human infections/carriers
Foodborne or Waterborne disease clusters unassociated with any recognized etiologic agent	Possible identification of new foodborne and/or waterborne disease agents

## V. Working Group 3

### Laboratory Issues Related to Foodborne, Waterborne and Enteric Disease Surveillance

**Question 1:** *What organisms and microbial toxins should be tested for as part of a national surveillance strategy for foodborne, waterborne and enteric pathogens or their toxins?*

**a) Laboratory Testing Capability for Specific Pathogens or Their Toxins**

#### **Discussion**

Currently, the foodborne, waterborne and enteric pathogens tested for by public health, other government agencies, hospital and private laboratories vary widely across Canada. There is a need to develop a comprehensive list of required tests and identify where this capability is currently located.

There will be (and needs to be) provincial/territorial differences in the selection of appropriate tests for the investigation of clinical, food and water samples (e.g., vibrios may be more important to Atlantic Canada and British Columbia).

Where more than one province or territory is involved, the organism needs to be included in a national system. The recommendations below have been prepared by subgrouping into clinical, food and water categories as appropriate.

Current availability of tests within each province and territory is as follows:

- **Clinical:** All provinces/territories have the capability to test to the genus level for bacteria and protozoa. For enteric viruses, P.E.I., N.W.T. and N.B. need to send specimens to outside laboratories.
- **Food:** All provinces/territories have either in-house capability or ready access to appropriate laboratory support. Because of mandate issues, access may not be automatic (e.g., domoic acid done by the Federal Department of Fisheries and Oceans; Federal Laboratories have responsibility for marketed products but not the food service level, etc.)
- **Water:** In-house capability exists in every province/territory (except N.W.T.) to do bacteria but capability for protozoa is limited.

Thus, clinical specimens in all provinces and territories can be tested to the genus level for bacteria and protozoa. However, for enteric viruses, some provinces and territories have to send specimens to another province for testing. All provinces and territories are also able to test (or have ready access to testing) for food microbiology services, although some testing (e.g., for domoic acid) is done exclusively by Federal Laboratories, which have responsibility for marketed food and water products.



## **Recommendations**

### **R12.**

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Two levels of testing capability should be developed consistently across Canada. The first category constitutes the full spectrum of tests for which there may be a requirement in the investigation of foodborne, waterborne and enteric disease. No one lab can provide the full spectrum of testing within this category and thus the province or territory is the minimum grouping for capability. The province/territory therefore would have the responsibility either to offer the identified tests or to ensure ready access to a lab that can offer this service (see Table 2). The second category comprises the minimum routine testing capability that should be available for work-up on routine clinical samples (grouped by stool culture, stool parasites and stool virology) and for testing of foods linked to outbreaks of foodborne disease (see Table 3). The list of tests in these two categories should not be static. Canada's needs and capabilities in each area will and must change. There should be revision at the level of the national surveillance body on an annual basis.

### **R13.**

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A specific list for water was developed for full laboratory testing. This was identified for outbreak situations only. Water is routinely tested for indicator bacteria for quality monitoring purposes and this information would not be used for routine surveillance. There is some interest in the use of coliphages and *Clostridium* spores as better indicators of the presence of viruses and parasites. Surveillance should be linked to established federal/provincial/territorial groups dealing with water issues.

### **R14.**

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A national laboratory strategy should be developed to optimize resource utilization. Provinces should be encouraged to develop cooperative arrangements with laboratories among the provinces (e.g., involving letters/memoranda of understanding). The issues of

cost recovery, privatization of routine laboratory testing and federal and provincial/territorial laboratory rationalization are currently under study through various federal and provincial/territorial program reviews, and the results should be reflected in this strategy.

### **R15.**

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Laboratory representatives should be active participants in formulating national surveillance strategies.

### **R16.**

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Baseline information from systematic monitoring should be developed as a critical component of an overall surveillance program.

### **b) Laboratory Testing Capability for Specialized Typing of Specific Pathogens**

## **Discussion**

Specialized typing procedures, to differentiate pathogenic strains of organisms beneath the species level, are required for investigations into the epidemiology and ecology of these pathogens. Local jurisdictions determine what tests they will provide. The requirements for specialized reagents, resident expertise and volume of testing are key determinants for the provision of these typing services. There are national reference centres established for typing of specific organisms, e.g., the Ontario Ministry of Health provides typing for *Yersinia* isolates.

## **Recommendations**

### **R17.**

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The spectrum of specialized typing procedures, outlined in Table 4 below, should be available for typing of foodborne, waterborne and enteric pathogens. A comprehensive inventory of laboratories providing these services should be developed and maintained by LCDC. (NOTE: At present most of these services are free; the issue of cost recovery needs to be addressed.)

Table 2.

**Organism/Toxin List for Full Laboratory Testing Capability  
(i.e., in-house capacity or ready access at provincial/territorial levels)**

Organism/Toxin	Clinical Samples	Food Samples	Water Samples
<i>Salmonella</i> spp.	✓	✓	✓
<i>Shigella</i> spp.	✓	✓	✓
Verotoxin-producing <i>Escherichia coli</i> (VTEC)	✓	✓	✓
Enterotoxigenic <i>E. coli</i> (Stable Toxin and Labile Toxin) (ETEC) (ST and LT)	✓	✓	✓
Enterocyte Adherent <i>E. coli</i> (EAEC)	✓	✓	✓
<i>Yersinia enterocolitica</i>	✓	✓	✓
<i>Legionella</i> spp.	✓	✓	✓
<i>Campylobacter</i> spp.	✓	✓	✓
<i>Aeromonas/Pleisiomonas</i> spp.	✓	✓	✓
<i>Vibrio cholerae</i>	✓	✓	✓
<i>Vibrio vulnificus</i>	✓	✓	✓
<i>Vibrio parahaemolyticus</i>	✓	✓	✓
<i>Bacillus cereus</i>	✓	✓	
<i>Listeria monocytogenes</i>	✓	✓	
<i>Clostridium difficile</i> toxin	✓		
<i>Clostridium perfringens</i> and toxin	✓	✓	
<i>Clostridium botulinum</i> toxin	✓	✓	
<i>Staphylococcus aureus</i> and toxin	✓	✓	
<i>Pseudomonas aeruginosa</i>		✓	
<i>Giardia lamblia</i> / <i>Entamoeba histolytica</i>	✓		✓ ( <i>Giardia</i> )
<i>Cyclospora</i> / <i>Cryptosporidium</i>	✓		✓ ( <i>Crypt.</i> )
<i>Toxoplasma gondii</i>	✓		
Hepatitis A	✓		✓
Other Enteric Viruses	✓		✓
Scombroid toxin		✓	
Paralytic Shellfish Poison		✓	
Domoic acid		✓	
<i>Trichinella spiralis</i>	✓	✓	
<i>Anisakis</i>		✓	

Table 3.

### Pathogen/Toxin List for Minimum Routine Laboratory Testing Capability

	Organism	Clinical Samples	Food Samples
Stool Culture	<i>Salmonella</i> spp.	✓	✓
	<i>Shigella</i> spp.	✓	
	<i>E. coli</i> O157: H7	✓	✓
	<i>Yersinia enterocolitica</i>	✓	✓
	<i>Campylobacter</i> spp.	✓	✓
Stool Parasites	<i>Bacillus cereus</i>		✓ (counts)
	<i>Listeria monocytogenes</i>		✓ (counts)
	<i>Clostridium perfringens</i>		✓ (counts)
	<i>Staphylococcus aureus</i>		✓ (counts)
	<i>Giardia lamblia</i>	✓	
	<i>Cryptosporidium</i>	✓	
	<i>Entamoeba histolytica</i>	✓	
	adenovirus/rotavirus	✓	

✓ = simple presence/absence

✓ (counts) = more specific data on counts

**Question 2:** *What are the minimum data that should accompany laboratory-confirmed isolates of foodborne, waterborne and enteric disease organisms to national reference laboratories?*

## Recommendations

### R18.

*The following minimum data should be provided with isolates that are sent to national reference laboratories:*

- a unique identifier
- test required
- source (specimen type)
- submitter name and address
- identification of the organism

Other pertinent data such as travel history, food history, etc., might also be routinely included.

**Question 3:** *Should a national body be established to study possible harmonization of laboratory methods and quality assurance programs?*

## Discussion

Laboratories providing clinical sample analysis have implemented quality assurance procedures and participate in proficiency testing programs as part of the licensing requirements for clinical laboratories. Proficiency testing samples are available through Clinical Microbiology Proficiency Testing (CMPT) (B.C.), the Canadian Laboratory Proficiency Testing Program (LPTP) (Ontario), Quebec, the College of American Pathologists (CAP) and LCDC. An interprovincial proficiency testing committee currently exists and meets annually in association with the Canadian

## Table 4.

### Specialized Typing Procedures for Foodborne, Waterborne and Enteric Pathogens

- Biochemical profiles
- Serotyping
- Phagotyping
- Antibiotic resistance profiles
- Toxin typing
- Toxin production
- Fatty acid profiles
- Multilocus enzyme electrophoretic typing
- Plasmid profiles
- Virulence gene probes
- Pulsed field gel electrophoretic typing
- Polymerase chain reaction-based typing method (e.g., Randomly Amplified Polymorphic DNA (RAPD))
- Ribotyping
- $\lambda$  Restriction Fragment Length Polymorphism (RFLP) typing
- Other DNA fingerprinting, e.g., sequovars

Association of Clinical Microbiology and Infectious Diseases (CACMID) meeting.

Food and water proficiency testing samples are available from some provincial/territorial health labs, e.g., CMPT (B.C.), Central Public Health Laboratory (Ontario) and federally through Agriculture and Agri-Food Canada's (AAFC) accreditation programs. AAFC has a program in place to accredit private laboratories to do government testing for microbial and chemical residues in foods. This program is run in partnership with the Standards Council of Canada (SCC).

Harmonization (i.e., "scientific demonstration of equivalency of procedures") of clinical laboratory methodology would enhance the quality of data provided to a national surveillance system. There are currently committees with mandates that overlap in this area, the Federal/Provincial/Territorial Advisory Committee on Epidemiology (ACE) and the Technical Advisory Committee (TAC).

Method harmonization exists for foods at the federal level through the Microbiological Methods Committee (MMC) which is coordinated by the Food Directorate, HPB. Internationally, the International Standards Organization's (ISO) Codex Alimentaries, and the Association of Official Analytical Chemists (AOAC) are some of the bodies recognized as standard setting/accreditation agencies for microbiological methods for food analysis. In Ontario, the

Technical Liaison Committee on Food Microbiology (TLCFM) is a Federal-Provincial Inter-agency Committee that coordinates method harmonization.

## **Recommendations**

### **R19.**

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*TAC and ACE (see Discussion above) should strike a working group to make harmonization of laboratory methodology for clinical specimens a priority. Representation of private laboratories on this working group should be considered.*

### **R20.**

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*Participation on the Microbiological Methods Committee (Food Directorate, HPB) should be expanded to include representatives from provincial/territorial, industry and private food testing labs. Consideration should also be given to including experts in waterborne disease, to address the full range of relevant issues.*

### **R21.**

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*LCDC should play a role in coordinating and facilitating the "cross-fertilization" of clinical, food, and water "streams" in the areas of methods harmonization, quality assurance and proficiency testing.*

# VI. Working Group 4

## Collection and Transmission of Foodborne, Waterborne and Enteric Disease Surveillance Data

**Question 1:** *What are the most significant gaps in the collection and transmission of surveillance data in Canada?*

### **Discussion**

The primary aim of any surveillance scheme is to provide timely data for identifying incidents and outbreaks of disease, and communicating this information to the relevant responsible authorities. The rationale behind any surveillance scheme is “information for action” but many obstacles lie in the path of achieving this goal.

Currently there are many gaps and other adverse factors in the system of supplying relevant and timely data. One objective of this Conference is to identify and make recommendations to resolve these issues.

There are many potential areas where data collection and transmission can be lost from the process of specimen taking to data reaching a national database. These gaps must be identified and highlighted to all physicians and public health stakeholders to try and ensure that all participants are aware of the deficiencies in the current system and how they might be resolved to realize the full benefits of surveillance nationally.

### **Recommendations**

#### **R22.**

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*A descriptive “roadmap” should be developed to help orient interested parties to the foodborne, waterborne and enteric disease surveillance “system,” including a clear and concise list and summary of all actors and their roles and responsibilities, and in all reporting routes.*

#### **R23.**

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*There should be a piloting and strengthening of sentinel surveillance systems to include high-risk areas and populations, and strategically focusing on key settings and data sources such as day-care centres, schools, pharmacies, walk-in clinics, health units, physicians, extended care facilities, workplaces and/or laboratories.*

#### **R24.**

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*A central log and communication strategies should be developed at the local level to identify illness or food- and water-related problems reported to multiple jurisdictions.*

#### **R25.**

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*The feasibility of obtaining data from existing databases, e.g., from hospitalization databases and laboratory information systems, should be investigated.*

R26.

*Public health surveillance should be considered when building health information systems.*

**Question 2:** *What incentives should be put in place to help maximize the collection and transmission of surveillance data?*

### **Recommendations**

R27.

*Improve awareness of current issues by increasing communication and educational opportunities amongst stakeholders, for example, through use of the Internet, distribution of regular briefs and newsletters, and reporting of "hot issues" in the Canada Communicable Diseases Report. Both laboratory and epidemiological findings should be included.*

R28.

*Provide ongoing feedback and acknowledgement to agencies/persons contributing to the reporting of data.*

R29.

*Improve awareness of and accessibility to public health agencies to facilitate reporting of illness and consumer concerns.*

R30.

*Simplify and standardize data elements and processes with an aim to facilitate reporting and to ensure compatibility with other disease surveillance systems.*

R31.

*Evaluate and demonstrate the economic benefits of surveillance in risk reduction and disease control strategies.*

**Question 3:** *What are the main issues related to patient and proprietary confidentiality that significantly impede the use of surveillance data?*

### **Discussion**

Patient confidentiality is of paramount importance in ensuring that the public "buys into" the system of surveillance by understanding that named data will only be supplied to the minimum number of levels in accordance with established legislation and guidelines.

### **Recommendations**

R32.

*Put in place mechanisms to protect confidentiality consistent with local requirements.*

R33.

*Investigate methods of using unique patient identifiers to track data and avoid duplication of records.*

R34.

*Develop Memoranda of Understanding (MOUs) between all agencies to clearly delineate ownership and use of data, including academic applications.*

**Question 4:** *Should a single, uniform software package be used to collect surveillance data across Canada?*

### **Discussion**

Compatibility in systems is a vital ingredient in the success of any surveillance scheme. Whilst a single system may be the ideal solution to resolve this issue, this will likely be impractical to implement in the diverse fields that can have an impact on public health in Canada. It is therefore important that other options are explored.

## **Recommendations**

### **R35.**

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*Ensure that local electronic data can be converted to a standard format to allow compilation of information at central base (e.g., ASCII).*

### **R36.**

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*In consultation with all stakeholders, continually update and improve data-handling systems, ideally progressing towards integrated systems. Newly-developed software should be evaluated on an ongoing basis to assess its value in public health reporting.*



# VII. Working Group 5

## Issues Related to Data Analysis, Dissemination and Access for Foodborne, Waterborne and Enteric Disease Surveillance

**Question 1:** *What analysis and aggregation of Canadian surveillance data should occur, and who should be responsible for carrying out this analysis?*

### **Discussion**

There are two broad types of data aggregation and analysis, based on the timeframe for action. The detection of unusual events and identification of outbreaks requires a *rapid response* mechanism. Detection is followed by advising those who need to know in order to initiate control activities. To develop *background or trend* analyses, data are required over a longer term and there is more time to interpret the data. The objectives of the latter are to provide input into, and to evaluate health policy and risk assessment; to provide indicators of health status of populations; and to establish the “normal” incidence of disease. In both timeframes there is a requirement for integration of information from sources other than the public health surveillance programs. Because the needs for analysis and reporting differ in some respects according to the timeframe, recommendations in this area are grouped under the appropriate heading, i.e., either *Rapid Response* or *Background and Trends*.

Data analysis is an integral part of surveillance, which uses a variety of tools to accumu-

late, partition, aggregate, compare, and display data. The unit of analysis may be a person, a geographic area, a food, or an outbreak. Strict definitions must be established for success.

### **Recommendations**

#### **a) Rapid Response**

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#### **R37.**

*Aggregation and analysis of surveillance data for the detection of outbreaks or emerging disease must be done at all levels in “real time”, that is, regularly and rapidly enough to be able to implement control measures. This includes data that may only be available at a provincial or national level on diseases or pathogens.*

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#### **R38.**

*Historical data with sufficient detail should be available to allow comparisons of current incidence with background incidence for comparable populations and times.*

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#### **R39.**

*The proposed National Advisory Committee (see R7. above) should evaluate needs for analysis, and should adopt or develop software tools (algorithms, standard outputs) to meet the needs for rapid analysis at local, provincial/territorial and national levels. This*

group should identify and/or recommend adopting existing software. The ideal is to have local, provincial/territorial, and national agencies using compatible systems. Software should allow for both official languages. Software should be flexible enough to allow for customization of the content for the needs of users. Graphical and statistical tools used to identify alerts should be accessible to all users of the surveillance data; at the same time, it must be recognized that the interpretation component of surveillance requires special knowledge/expertise and that analysis cannot rely only on software.

#### R40.

The proposed National Advisory Committee (see R7. above) should respond to provincial/territorial needs by facilitating development of, and access to, tools for data analysis (e.g., a common understanding of how data can/should be presented; guidelines for analysis). LCDC should also play a role in assisting with data analysis, where required.

#### b) Background and Trends

#### R41.

The proposed National Advisory Committee (see R7. above) should facilitate the identification and cataloguing of related databases from regulatory and other agencies at all levels (e.g., data from inspection of imported seafood at Fisheries and Oceans Canada and imported food at Agriculture and Agri-Food Canada).

#### R42.

Unnecessary duplicate transmission of data should be avoided. For example, provinces should identify an explicit process for the integration of databases at the provincial/territorial level with functional electronic linkages and sharing of data. A flag or identifier can help achieve this. The actual/logical linkage may take place at the provincial/territorial or local level. Joint investigations should be encouraged wherever appropriate; if separate

reports are necessary (e.g., to target different audiences), they should be well coordinated.

#### R43.

Adequate standards and processes for quality assurance and validation of data should be established at all levels.

#### R44.

Consideration should be given to archiving non-aggregated data when originally collected in order to allow for future special studies to make use of historical data.

**Question 2:** What should be the content and format of vehicles to disseminate foodborne, waterborne and enteric disease surveillance data?

### Discussion

A variety of reports have been produced at all levels. Traditional paper-based publishing is gradually giving way to a variety of electronic media, especially for information requiring rapid response. Short timelines, the ability to take definitive control actions and the wide variety of vehicle and etiologies for foodborne and waterborne diseases impose special needs for information dissemination.

Rapid response will require rapid dissemination of information. This may often be a very brief, preliminary description of a problem followed by additional details over time. This information can be disseminated via voice, fax, or other electronic means.

Vehicles for dissemination of *background and trends* data include reports based on medium- to long-term data. With respect to the presentation of report data, a number of factors are important:

- they should include interpretation of the data rather than just long tabulations
- rates are usually more informative than numerator data

- attention must be paid to clarity, photocopier reproducibility
- there should be consistency of data presentation
- visual (graphic) presentations may provide the “quick picture” better than tabulations

## Recommendations

### a) *Rapid Response*

#### R45.

*The ability to disseminate surveillance information quickly must be present at all levels. There should be no delay in submitting preliminary data.*

#### R46.

*The proposed National Advisory Committee (see R7. above) and users must identify and address security issues relevant to the transmission of sensitive data while not hindering access by those who need to know.*

### b) *Background and Trends*

#### R47.

*Stakeholders should be adequately consulted to determine their data needs and priorities. All data that are collected in the surveillance program must be disseminated (or otherwise readily accessible) in some form to pertinent stakeholders.*

#### R48.

*There should be a national annual report which appears within 12 months of the end of the reporting period. Special studies based on surveillance data should be catalogued in the annual report.*

#### R49.

*Reports produced by Health Canada, the provinces or other agencies should follow the following guidelines:*

- identify data sources, audiences, and case definitions
- be produced within specified time limits, depending on the timeframe for collection
- be based on user needs and evaluated with regards to format and content

#### R50.

*Periodic surveillance summaries (i.e., multi-year, on selected issues/trends) should be prepared on a less frequent basis and annexed to the annual report. A timetable for preparation of summaries should be drawn up, providing sufficient lead time for data providers and ensuring user-friendly formats for data input.*

#### R51.

*A timetable should be identified for a (periodic) intersectoral conference on foodborne and waterborne disease.*

#### R52.

*A survey should be conducted to identify the user community and its needs for print and electronic media.*

**Question 3:** *What should be done to enhance appropriate access to surveillance data?*

## Discussion

There are limitations on access, including confidentiality (identifiers, small area data); legislative limits on the level of aggregation of data that may be shared with others; require-

ments for interpretation; the cost to make data available; and the volume of data.

## ***Recommendations***

### ***a) Rapid Response***

#### ***R53.***

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*Data must be accessible to the local level of public health as well as provincial/territorial and national levels.*

#### ***R54.***

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*Dissemination to the public, media, industry and other stakeholders of preliminary findings should be managed by appropriate public health agencies, to ensure responsible communication and use.*

### ***b) Background and Trends***

#### ***R55.***

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*Annual reports and other surveillance summaries, i.e., data that have been validated,*

*analyzed and interpreted, must have broad, unhindered, public access.*

#### ***R56.***

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*Agencies should consider cost recovery only for paper copies of these reports. There should be no copyright on them.*

#### ***R57.***

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*Data providers must be the first to receive (or have priority access to) reports based in whole or in part on data they have provided, whether in a print or electronic mode.*

#### ***R58.***

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*A catalogue of available reports should be developed at each level, and made widely available, perhaps facilitated by LCDC.*

## VIII. Working Group 6

### Surveillance for Determinants and Outcomes Related to Sporadic Cases and Outbreaks of Foodborne, Waterborne and Enteric Diseases

**Question 1:** *What surveillance information should be collected on determinants (and outcomes) of foodborne, waterborne and enteric disease?*

#### **Discussion**

The use of information on individual cases and outbreaks varies with the different requirements at the local, provincial/territorial and national levels. With this in mind, the primary focus is on the *minimum* data required to meet the needs of the relevant bodies at each level. It is important that any data collection program should minimize duplication and effort in the light of the wide responsibilities of these bodies and should therefore economize on the time and resources required to investigate and collect the relevant data. Further account must be taken of Canada's responsibilities to provide information to international bodies such as the World Health Organization (WHO). Most importantly, data collected should be the minimum required to provide information for local, provincial/territorial and national policy development. There is a need for specific quantitative data for risk assessments. There is also a need for public education or information to assist in the control of outbreaks and to reduce public

anxiety. In formulating the recommendations below, reference was made to existing reporting forms used in Canada and the U.K., and the recent Canadian Public Health Association (CPHA) report on waterborne disease surveillance.

There was *no* consensus on the precise list of minimum data required at the various jurisdictional levels, although there *was* general agreement that the proposed National Advisory Committee (see R7. above) should examine the issue and make recommendations in this regard, taking into account the initial suggestions raised at the Consensus Conference.

#### **Recommendations**

##### **R59.**

*The proposed National Advisory Committee (see R7. above) should review the following array of determinants (and related outcomes, risk factors and identifiers) to obtain consensus on the minimum datasets required at the local, provincial/territorial and national levels for the surveillance of sporadic cases and outbreaks of foodborne, waterborne and enteric diseases:*

# Initial Conference Suggestions for Minimum Data Required at Each Jurisdictional Level (No Consensus; Suggestions for Further Consideration Only)

## *Federal/National*

### *Sporadic cases:*

Identifier (to avoid duplications, and facilitate trace-back)  
Date of onset  
Confirmations (clinical, laboratory, epidemiological)  
Outcome (e.g., mortality, hospitalization)  
Etiological agent  
Geography  
Age and sex  
Risk factors (food, travel, place, pets, work environment, etc.)  
Associated cases

### *Outbreaks:*

Etiologic agent  
Locality  
Onset  
Establishment, place of mishandling  
Vehicle (food, water, including significant/primary ingredients in food, pH [acidity], Aw [water activity], etc.)  
Quantity of food/water consumed  
How many/what quantities of pathogens/toxins present  
Summary of clinical data (symptoms, incubation, duration)  
Laboratory data (toxin, typing)  
Contributing factors  
Mode of transmission (food, water, person-to-person, other)  
Numbers at risk, ill and positive (laboratory-confirmed)  
Evidence of association  
Deaths  
Hospitalizations

## *Provincial/Territorial*

### *Sporadic cases:*

Same as for Federal Government  
Free text option to give anecdotal information

### *Outbreaks:*

Same as for Federal Government  
Narrative report on outbreak  
Treatment  
Hospitalizations

## *Local*

### *Sporadic cases:*

Same as for federal and provincial/territorial needs, plus basic reference information on the *Investigator* (name, affiliation, contact point), *and* the following information on the reported case(s):

<i>Person:</i>	<i>Place:</i>	<i>Time:</i>
Age	Occupation	Onset
Sex	School	Duration
Address	Day care	Notification
Telephone number	Recreation	
M.D. Telephone number	Travel	
Medical conditions		
Treatment		
Pets, habits, hobbies		
Associated illness		
Symptoms		
Food characteristics		
Water characteristics		
Sewage		

### *Outbreaks:*

Same as for federal and provincial/territorial needs and:  
Investigator  
Geographical distribution  
(Special studies: consumption data, body weight)

R60.

*Data on water, meat, poultry and other food product quality and environmental factors should be explored for possible integration into a national surveillance program for foodborne, waterborne and enteric diseases.*

R61.

*Recognizing that investigation is normally a response to illness complaints within the local community, the timely and appropriate reporting of complaints by individuals should be encouraged and facilitated through coordinated access points at the local level.*

**Question 2:** *Should foodborne, waterborne and enteric disease outbreaks caused by selected pathogens be notifiable nationally?*

### **Discussion**

Irrespective of the organism, all foodborne, waterborne and enteric disease outbreaks should be notifiable to enhance ascertainment of incidents. This is to improve sharing of information for national and international reasons, and to monitor the measures taken for control purposes. This information should be transmitted at the local level between laboratory and provincial/territorial epidemiologist. Information should be passed as quickly as possible between the relevant bodies.

### **Recommendations**

R62.

*All outbreaks of foodborne, waterborne and enteric disease should be made notifiable (i.e., by regulation) in order to enhance incident*

*ascertainment, and appropriate control and prevention responses.*

**Question 3:** *Should there be a nationally uniform protocol for the investigation of foodborne, waterborne and enteric disease outbreaks?*

### **Discussion**

In principle, there should be a nationally uniform protocol for investigation of outbreaks. However, this should have certain characteristics including an agreed electronic format, and uniform transmission of content data between the local, provincial/territorial and national levels. In addition, there should be a reasonable level of flexibility and review to allow response to changing demands and circumstances. Protocols have already been formulated by various national and international bodies [e.g., International Association of Milk Food and Environmental Sanitarians (IAMFES), Canadian Public Health Association (CPHA) Report on National Surveillance of Waterborne Diseases in Canada, commissioned by the Environmental Health Directorate, HPB] and these should be assessed as part of a process to formulate a national protocol.

### **Recommendations**

R63.

*A national protocol for outbreak investigation should be developed in consultation with a wide range of potential stakeholders, including consumers, the food industry, laboratories, epidemiologists, health inspectors, Ministries of Health, etc. Consideration should be given to integration and harmonization with appropriate existing protocols.*





# **Appendix 1**

## ***Planning Committee Members***

The Planning Committee was responsible for the planning and organization of the Consensus Conference, including development of the objectives and agenda, design of the overall Conference format and process, selection of invited participants and coordination of presentations, working groups and plenary sessions. Together with the Working Group Chairs and Rapporteurs, they also reviewed these Conference proceedings prior to publication.

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# **Appendix 3**

## ***Agenda***

***National Consensus Conference on Foodborne  
and Enteric Disease Surveillance  
November 28, 29, 30, 1995  
Ottawa, Ontario***

Richelieu Room  
Citadel Hotel and Convention Centre  
101 Lyon Street, Ottawa, Ontario

**Chairperson — Dr. Monique Douville-Fradet**

### ***Tuesday, November 28, 1995***

- 08:30      **Opening Remarks:** Mr. Kent R. Foster, Health Canada
- 08:45      **Objectives, Format and Outcomes of Conference:** Dr. Jeff Wilson
- 09:00      **European SALMNET Information System:** Mr. Ian Fisher
- 09:30      **WHO Surveillance Program:** Professor Klaus Gerigk
- 10:00      **Refreshment Break**
- 10:15      **U.S. Surveillance System:** Dr. Nancy Bean
- 10:45      **U.K. Surveillance System:** Dr. Paul Sockett
- 11:15      **Panel Discussion**
- 11:45      **Lunch — Top of the Hill South**
- 12:45      **Canadian Surveillance System:**  
            Dr. Ewen Todd  
            Dr. Wendy Johnson  
            Dr. Trevor Williams  
            Mr. Will Robertson
- 13:30      **Question Period**
- 13:45      **Identification of Working Groups Task to Develop Recommendations:** Dr. Jeff Wilson
- 14:00      **First Working Group Session**
- 15:00      **Refreshment Break**

15:15      **Session (cont'd)**  
17:00      **Adjourn**  
17:30      **Meeting, Planning Committee and Working Group Chairs**

***Wednesday, November 29, 1995***

08:30      **Introductory Comments:** Dr. Monique Douville-Fradet  
08:40      **Working Group Sessions (6) (cont'd):** Chairpersons and Rapporteurs  
10:00      **Refreshment Break**  
10:15      **Presentations (cont'd)**  
12:00      **Lunch — Top of the Hill South**  
13:00      **Second Working Group Sessions**  
15:00      **Refreshment Break**  
15:15      **Presentations by Working Groups (6):** Chairpersons and Rapporteurs  
17:15      **Adjourn**  
17:30      **Meeting of the Planning Committee and Working Group Chairs**

***Thursday, November 30, 1995***

08:30      **Introductory Comments:** Dr. Monique Douville-Fradet  
08:40      **Presentations by Working Groups (6), and Plenary Consensus**  
10:00      **Refreshment Break**  
10:15      **Working Group Presentations and Plenary Consensus (cont'd) (with working lunch)**  
14:15      **Closing Remarks:** Dr. John Spika, Health Canada  
14:30      **Adjournment**

# Appendix 4

## *Working Groups*

### **Working Group 1:**

*Objectives, timeliness and critical data required for a national foodborne, waterborne and enteric disease surveillance system.*

**Chairperson:** Dr. Alison Bell

**Rapporteur:** Dr. John Spika

#### **Participants:**

Dr. Fraser Ashton

Dr. Tom Feltmate

Mr. David Schroder

Mr. Duncan Ellison

Mr. Ken Hawkins

Ms. Elizabeth Taylor

Ms. Nidia Coyote Estrada

Ms. Doreen Moore

Dr. Mitchell Zellman

### **Working Group 2:**

*Coordination of a national strategy for foodborne, waterborne and enteric disease surveillance and related special studies.*

**Chairperson:** Dr. Michel Savard

**Rapporteur:** Dr. Wendy Johnson

#### **Participants:**

Dr. Nancy Bean

Mr. Michael Goddard

Dr. John Lynch

Ms. Alexa Brewer

Mr. Jean Kamanzi

Mr. Gary Moulton

Mr. Richard Davies

M. Yvan Lamontagne

Dr. Jane Pickersgill

### **Working Group 3:**

*Laboratory issues related to foodborne, waterborne and enteric disease surveillance.*

**Chairperson:** Ms. Donna Mae Burgener

**Rapporteur:** Dr. Susan Read

#### **Participants:**

Dr. Louis Abbott

Mr. Florian Gosselin

Dr. John Waters

Mr. Peter Boleszczuk

Mr. Doug Griffith

Dr. Trevor Williams

Dr. Ed Chan

Dr. David Haldane

Mr. David Woodward

Dr. Karen Dodds

Dr. Chuck LeBer

**Working Group 4:**

*Collection and transmission of foodborne, waterborne and enteric disease surveillance data.*

**Chairperson:** Dr. Anna Lammerding

**Rapporteur:** Mr. Will Robertson

**Participants:**

Mr. Tony Amalfa

Mr. Ian Fisher

Dr. Carolyn Pim

Dr. Maureen Baikie

Ms. Ruth Jaeger

Dr. Hilary Robinson

Ms. Mona Crowley

Mr. Rasik Khakhria

Ms. Sharon Chard

**Working Group 5:**

*Issues related to data analysis, dissemination and access for foodborne, waterborne and enteric disease surveillance.*

**Chairperson:** Dr. Anne Carter

**Rapporteur:** Dr. Jamie Hockin

**Participants:**

Dr. Chandar Anand

Mr. Andre Gorayeb

Dr. Faith Stratton

Dr. Chris Balram

Dr. Michael Kelly

Ms. Ilana Warner

Ms. Sharon Flack

Dr. Arlene King

Professor Klaus Gerigk

Dr. Karl Klontz

**Working Group 6:**

*Surveillance for determinants and outcomes related to sporadic cases and outbreaks of foodborne, waterborne and enteric diseases.*

**Chairperson:** Dr. Doug Kittle

**Rapporteur:** Dr. Paul Sockett

**Participants:**

Dr. Ed Chan

Dr. Les Gammie

Ms. Phi-Bang Ngo-Dansereau

Ms. Carol Crawford

Mr. Frank Hamilton

Dr. Ewen Todd

Mr. George Eng

Ms. Sandra March

**NOTE:** Dr. Ed Chan split his time between two working groups.

# Appendix 5

## *Key Points From the Presentation by Mr. Ian Fisher on the European SALMNET Information System*

Mr. Fisher described the European SALMNET Information System, highlighting its innovative approaches to foodborne disease surveillance.

### ***Background***

Inspired by both the collaborative spirit, and the declared commitment to human health protection of the Maastricht Treaty, SALMNET has been funded by the European Commission's Biomedical and Health Research program (BIOMED 1), which finances European projects that can demonstrate a "value-added" component over individual national projects; and, is currently funded by BIOMED 2 (runs from 1994-1998), which allows for the participation of non-European countries, like Canada, South Africa, and Australia.

### ***Types and Sources of Data***

More specifically, SALMNET seeks to harmonize and extend the use of *Salmonella* phage typing; introduce a laboratory quality assurance scheme for phage typing; establish a core set of data for each isolate; use these data to create an international database; utilize electronic communications to supply information and update the database; and, develop auto-

mated cluster detection software and introduce a rapid communication system to inform all participants of any potential problems and inquire if they have any information that may be relevant to a situation occurring in any participating country.

### ***Outbreak Reports***

SALMNET created an international database, with 14 initial member countries in Europe, linking a network of public health scientists to utilize electronic communications to supply information and update the database, develop automated cluster detection software and introduce a rapid communication system to inform all participants of any potential problems, re: *Salmonella*.

### ***Receipt and Dissemination of Data***

The SALMNET database is held centrally at Colindale, with monthly updates being received either by floppy disk or via the Internet; if the Internet is used, then the data are encrypted and the password sent separately. These data are incorporated into the database and a monthly analysis to identify any unusual occurrences is run and reported back to all participants.

# **Appendix 6**

## ***Key Points From the Presentation of Professor Klaus Gerigk on the WHO Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe***

Professor Gerigk shared insights into the operations of the WHO Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe.

### ***Background***

National reporting systems, and even statutory reporting, vary widely. Furthermore, discrepancies in defining the parameters of what constitutes a foodborne disease cause difficulties when trying to compare national figures related to foodborne disease. A case in point: Although a common definition of foodborne disease was agreed upon for the World Health Organization (WHO)-EURO Programme, it is not strictly used in all national reporting systems. Thus, an exact comparison of national figures is not possible and differences in morbidity (cases per 100 000 inhabitants) may purely find their explanation in this different manner of reporting.

### ***Types of Data***

The WHO Surveillance Programme attempts to gather the following information and data: the number of persons ill; causative agent; type of food; place where food was consumed; place where food was acquired; place where food was contaminated; and, factors contributing to outbreak.

### ***Sources of Data***

The national sources of these data are statutory notification (cases reporting); reporting of epidemiologically investigated outbreaks; laboratory reports; and, special surveys.

### ***Dissemination of Data***

The Centre publishes both an annual report (the most recent of which was published in 1993) and newsletters (4 or 5 per year).

# **Appendix 7**

## ***Key Points From the Presentation by Dr. Nancy Bean on the United States' Foodborne Disease Surveillance System***

Dr. Bean highlighted the following three key features of the American system for surveillance of foodborne diseases and related risk factors.

### ***Laboratory Information Tracking System***

The Laboratory Information Tracking System's purpose is to provide specimen information; test results; specimen tracking; a query/filter function; data sharing; and, reports to submitters. Furthermore, it is characterized by a number of important and useful features: unique specimen numbers; Lan-based; report printing; track/locate; patient link; security; pick lists; data filters; Boilerplate comments; test groups; specimen aliquots; nag list; and export. The hope, and plan, for future enhancement is that the Laboratory Information Tracking System (LITS) will be integrated into the Public Health Laboratory Information System (PHLIS), and that it will be generalized to other pathogens.

### ***Outbreak Detection***

Outbreak Detection is facilitated through weekly assimilation of data; an Outbreak

Detection Program; evaluations of warnings; and, the contacting of CDC and State epidemiologists. Monitoring *Salmonella stanley*, for example, endorsed the effectiveness of the outbreak tracking system internationally, actually tapping into SALMNET.

### ***Public Health Laboratory Information System (PHLIS)***

The Public Health Laboratory Information System, which is now distributed in its new version (Version 3.0), has provided major change to the relational data system: with regard to patient information, it allows data management across modules; with regard to specimen information, that information can be varied; and, with regard to testing, it can be done for laboratory or epidemiology. More specifically, it gathers all data types, in a user-friendly (user-defined modules) manner: epidemiologic; laboratory; hospital; outbreak; special studies; and, surveys. CDC is also developing Sexually Transmitted Disease modules.



# Appendix 8

## *Key Points from the Presentation by Dr. Paul Sockett on the United Kingdom's Foodborne Disease Surveillance System*

Based upon his previous experience in the United Kingdom, Dr. Sockett highlighted the following key features of the British approaches to foodborne disease surveillance.

### **Background**

#### ► **Formation of Public Health Laboratory Service (PHLS)**

- provided network of labs which would report centrally their microbiological findings, on a voluntary basis.
- centralized reference facilities to provide expertise in the detailed identification of micro-organisms and maintain lab standards.
- formation of the Epidemiology Research Laboratory to develop and maintain a national system for collection of patient-based data for epidemiological purposes. These functions were taken over in 1977 by the Communicable Diseases Surveillance Centre (CDSC) which developed into a national centre of epidemiological expertise.

#### ► **Government response to the increase in *Salmonella* reporting associated with contaminated eggs in 1987:**

- a detailed Government Inquiry into the cause of the *Salmonella* and egg problem which led to a detailed examination of the type, quality and methods of

collection of data related to foodborne and other gastro-intestinal diseases.

- the (United Kingdom) Advisory Committee on the Microbiological Safety of Food (ACMSF) has a series of working groups which report on specific parts of the food chain — can request data and, on behalf of ACMSF, conduct investigations.
- ACMSF has four aims: to establish the causes of foodborne disease occurring in humans; to evaluate the relative importance to human health arising from such disease; to identify and develop means of management of the potential risks to human health; and, to advise Ministers on the means of reducing the incidence of foodborne disease.

### **Types and Sources of Data**

There are basically two sources of data on gastro-intestinal and foodborne illness in England and Wales (Scotland collects and analyzes their own data but cooperates closely with PH organizations at all levels in the rest of the U.K.): 1) Statutory notifications of "food poisoning," and 2) Laboratory reports of individual cases.

## ***Method of Collection***

The method of collection was paper-based until 1990, but there have been three important developments since:

1. Rationalization of report forms to two types, both collecting details on named patients. One used to report to LEP and the other to CDSC.
2. Development of Electronic On-Line reporting by the Public Health Laboratory Service (PHLS) to the PHLS ORACLE database.
3. Development of a single "Combined" *Salmonella* database derived from data received by LEP and reports to CDSC.

All individual case reports are analyzed weekly to identify excess reporting of any species of organism.

## ***Outbreak Reports***

Reports are to come from both Laboratories, Environmental Health Officers and/or Consultants in Communicable Disease

Control (CCDCs) (U.K. equivalent to Canadian Medical Officers of Health). The collection method was initially a passive system based on a series of report forms but is now a semi-active program based on a single report form.

Analysis of Outbreak Reports involves:

- Monthly summaries (all causes)
- Quarterly listings (*Salmonella*)
- Detailed reports giving analysis by risk factors (e.g., Manufactured Foods, Milk and Dairy, Shellfish, etc.).

## ***Conclusions***

The system has:

- Played an important role in the identifying and limiting of many outbreaks.
- Played an essential role in the development of government policy relating to all levels of food production and preparation — and hereby hopefully been instrumental in improving standards.
- Provided key information for development of educational materials, professional and public.

# Appendix 9

## *Key Points From the Presentation by Dr. Ewen Todd on Foodborne Disease Reporting in Canada*

Dr. Todd provided an overview of foodborne disease reporting in Canada.

### ***Background***

In 1975, a Working Party from Health Protection Branch (LCDC, Food Directorate, and Field Operations Directorate), was formed to clarify the kind of data that should be used from various international surveillance systems. They agreed that there should be two components of a successful national program: 1) **The Disease Surveillance System** which reports on diseases for immediate action, identifies clusters of cases by epidemiological studies and laboratory analysis, and shows short term trends with monthly/quarterly reports; and, 2) **the Disease Outbreak Reporting System**, responsible for annual reports with detailed information on outbreaks and single cases.

The report of the Working Party was adopted in 1975 and annual summaries have been published by the Foodborne Disease Reporting Centre for 15 years in both official languages. In Canada, the last summary to be released was in 1987, but data are available electronically for 1988 and 1989, and a 10-year summary showing various types of trends was published for 1975-1984.

### ***Receipt and Dissemination of Data***

All the line listings of foodborne disease incidents (outbreaks and single cases) are

published along with detailed tabulations of the data by etiology, food, place of acquisition, place of mishandling, month of occurrence, and province/territory. Unlike the United States, data are also received from federal investigations (by HPB and Department of Fisheries and Oceans) to include illness complaints concerning processed food. Etiology includes microbiological, parasitic, animal, plant and chemical agents.

The contents of these reports have been used by HPB, other government agencies, and the food industry for preparing risk assessments (hazards, cost-benefit analysis), developing HACCPs (hazards, factors contributing to incidents), recommending regulatory change and public health campaigns, and assisting in training food industry personnel.

### ***Conclusions***

Dr. Todd pointed out that, in addition to improving the timeliness and mode of distribution, the conclusions reached from the illness reports are only as good as the original investigations, conducted for the most part at the local or regional level, where shrinking resources have put stress on foodborne disease investigations and control programs. Unless there is more coordination and resources at all levels of government directed towards a national reporting system, the Reporting Centre will be limited in its effectiveness within a national food safety program.

# Appendix 10

## ***Key Points From the Presentation by Dr. Wendy Johnson on Canada's National Laboratory for Enteric Pathogens: National and International Early Warning Systems***

Problems and Deficiencies with the existing system include:

1. Incoming information: missing data; delays; duplicates and outbreaks; research projects (?); provincial inconsistencies; and, incorrect use of nomenclature.
2. Timeliness: report unrelated to seasonal incidence.
3. LCDC Informatics: software needs updating and the current "card box" system is antiquated.

### ***Dissemination of Laboratory-Based Surveillance Data***

- Publications, include Monthly reports, Quarterly Summary in *Safety Watch*, and Annual Summaries.
- Dissemination, goes to Public Health Workers; Medical Health Officers; Private and Public Institutions; and International Reference Centres.

### ***Enteric Pathogen Reporting System***

Scope of Commentary:

- Unusual Findings
- Imported Serotypes: residents and visitors
- Imported Products: types and sources, country of origin, and food or animal association.

Enhanced Surveillance (1980-1995):

- Emerging Pathogens: *Campylobacteraceae*; *Aeromonadaceae*; *E. coli* O157; and, Non-human *Salmonella*.
- Phagetypes: *E. coli* O157 and *Salmonella*.

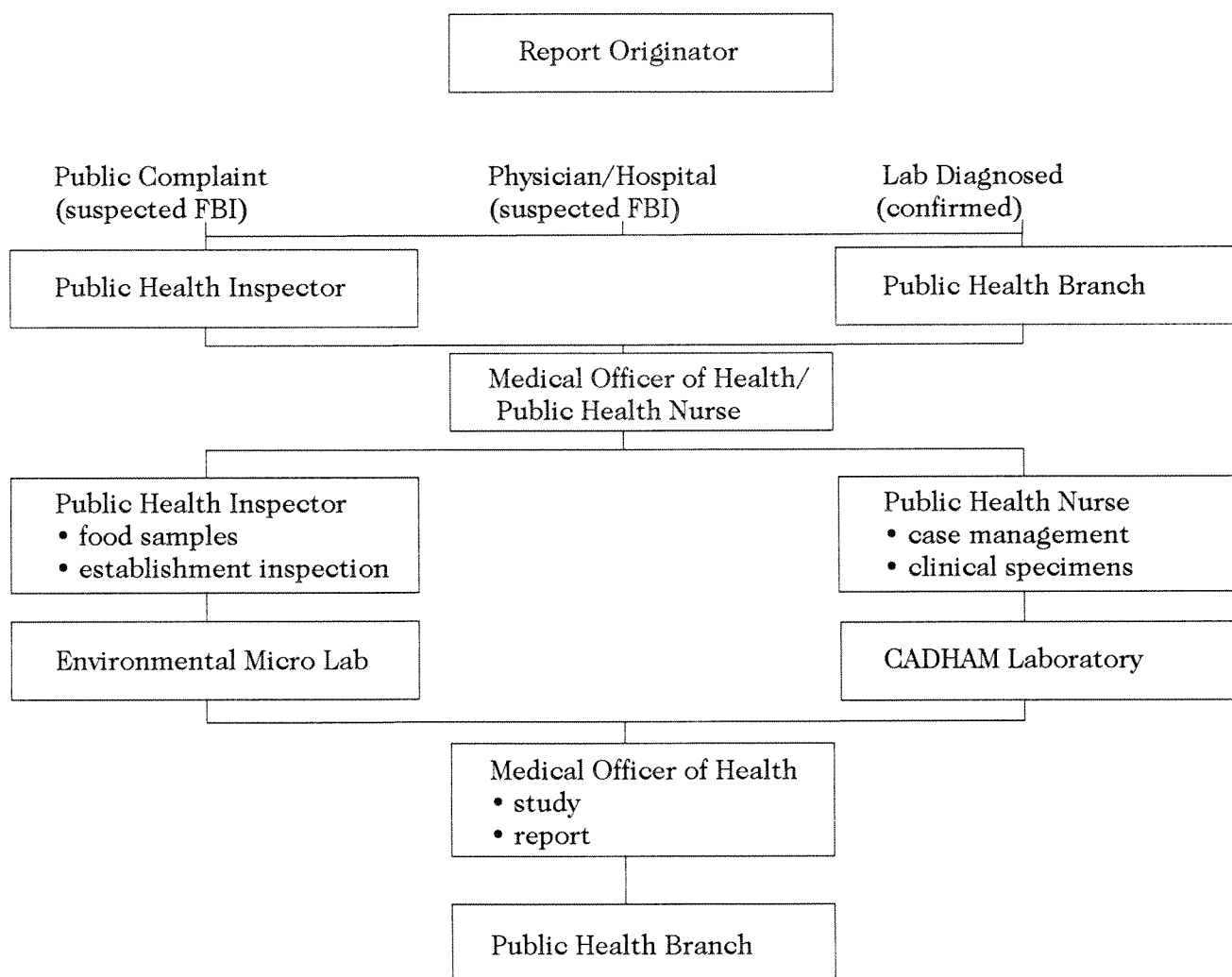
Laboratory-Based Surveillance (1949-1995):

- Joint Partners: National Enteric Reference Centre and the Provincial Laboratories of Public Health.
- Pathogens: *Salmonella*, *Shigella*, and pathogenic *E. coli*.

# Appendix 11

## *Key Points From the Presentation by Dr. Trevor Williams on Canada's Alert Mechanisms for Clinical Data Collection*

### *Foodborne Illness Investigation (FBI)*



# Appendix 12

## *Key Points From the Presentation of Mr. William Robertson on Canada's National Surveillance System for Waterborne Disease*

The survey taken by the Canadian Public Health Association, on behalf of the Environmental Health Directorate, had a response rate of 71%; 80 responses were received to the 112 questionnaires sent. In addition, 16 unsolicited responses were also received and 7 international experts were interviewed by phone.

The following are the subsequent recommendations on waterborne disease surveillance:

1. Establish a national waterborne disease surveillance system that would address all diseases transmitted by ingestion or contact with water, i.e., drinking water and recreational water, react quickly to control or prevent waterborne disease, and vigorously pursue data.
2. System could be used as a template for other areas of health surveillance, such as foodborne disease, that may need to become more responsive.
3. System should encompass specific functions, for example:
  - strike a balance between data that are complete enough to serve the goals of the surveillance system, but modest enough to ensure an efficient system;
  - analysis of data should serve at least four purposes: facilitate risk communication and risk management, identify trends, and facilitate comprehensive research on waterborne diseases;
  - include an evaluation component to assess and refine system performance;
  - allow the timely dissemination of compiled data;
  - educate the public, water treatment plant officials, policy makers, physicians, etc. on the risks of waterborne disease and the benefits of a surveillance system.
4. Use a mixed system of communication that maximizes the use of computer networks while allowing for paper-based means and telephones where necessary.
5. System must have an accountable administration and a strong funding base.

# Appendix 13

## *Scope of Diseases and Organisms/Pathogens Covered*

The organisms/disease conditions that should be considered when developing the optimal system include, but are not limited to, the following. Emphasis should also be placed on the specific/unique characteristics of the individual organisms under evaluation (e.g., antibiotic resistance, serotype, etc.)

### ***Infectious Foodborne Enteric***

VTEC infection  
Arcobacter infection  
Typhoid/Paratyphoid  
EPEC infection  
Shigellosis  
Viral Gastroenteritis  
ETEC infection  
Anisakiasis  
Non-typhoidal *Salmonella* infection  
Cholera  
*Helicobacter* infection  
*Bacillus cereus* food poisoning  
Taeniasis  
*Campylobacter* infection  
*Clostridium perfringens* infection  
Yersiniosis  
Diphyllobothriasis  
*Vibrio parahaemolyticus* infection

### ***Infectious Foodborne Non-Enteric***

Listeriosis  
Trichinosis  
Toxoplasmosis  
Streptococcal infections

### ***Infectious Non-Foodborne (including waterborne) Enteric***

*Giardia* infection  
Amebiasis  
*Aeromonas* infection  
*Cyclospora* infection  
*Cryptosporidium* infection  
Viral Gastroenteritis

### ***Acute Non-Infectious Foodborne Enteric***

Staphylococcal food poisoning

### ***Acute Non-Infectious Foodborne Non-Enteric***

Botulism  
Scombroid toxicity  
Paralytic shellfish poisoning

### ***Emerging Diseases and Organisms/Pathogens***

Source: *Health Canada Re-Engineering Action Plan No. ND02: National Surveillance and Monitoring System for Infectious Food and Waterborne and Enteric Diseases*, Background Discussion Paper, LCDC, HPB, Health Canada, November 1995.

## Notes