



# C-EnterNet News

Volume 1, 2006

## Editor's Note

Welcome to the first issue of C-EnterNet (pronounced "centre net") News. We will be using this medium to keep you informed of our activities and recent events on a quarterly basis. This first issue is designed to give readers an overview of the C-EnterNet program and our progress to date at our first sentinel site.

It has been a challenging and exciting journey from the concept stage (late 2003) to the launch of the initial pilot site (June 2005) and beyond. Along the way numerous local, provincial and national stakeholders in food safety, water safety and public health have rallied to make this program possible. As we collect data and prepare for the annual analyses and reports, we still have many challenges ahead – including expansion of our surveillance activities, maintenance of those already in place, and a continued search for sustainable funding. However, we are moving ahead, encouraged by the successes we have achieved.

Many of you know at least one of the C-EnterNet team members and have seen their hard work and dedication first-hand. Through this newsletter, I hope you will also learn about the other activities, stakeholders and team members. We will be providing more details about specific activities in future issues.

**Dr. Frank Pollari**  
Program Lead

## Background

The C-EnterNet program was initiated in the fall of 2003, when funding became available through the Agricultural Policy Framework initiative of Agriculture and Agri-Food Canada. The five-year funding (which is leveraged with funding from the Public Health Agency of Canada, the Ontario Ministry of Agriculture, Food and Rural Affairs, and the Canadian Water Network)

supports the design and implementation of a pilot sentinel site for a national, integrated enteric pathogen surveillance system.

The primary goals of this multidisciplinary system are to:

1. Detect changes in trends in human enteric disease and in levels of pathogen exposure from food, animal and water sources in a defined population

2. Conduct source attribution (determine the proportion of human cases due to exposure via water, food and animals)
3. Improve the analysis, interpretation and reporting of laboratory and epidemiological data for public health, water and agri-food purposes

C-EnterNet is designed as a network of stakeholders. It is based on the following guiding principles:

- To build on current infrastructure through collaborations
- To integrate and link data sources, i.e. humans, water, animals and food (running the same microbiological tests in all C-EnterNet components)
- To utilize the sentinel site design for high-quality, intensive sampling and data
- To enhance capacity at all governmental levels (local, provincial, federal)
- To generate science-based results to inform policy decisions

The following articles describe activities in the major components of the C-EnterNet program. These components work together to give us detailed data and useful information with respect to foodborne, waterborne and enteric disease prevention strategies.

## A note from C-EnterNet's Site Liaison, Barbara Marshall

*"Public health perspective... The launch of C-EnterNet and beyond"*

C-EnterNet celebrated the launch of its first (pilot) sentinel site at Region of Waterloo Public Health (ROWPH) on June 1, 2005, with an opening speech by ROWPH's Medical Officer of Health, Dr. Liana Nolan. ROWPH manager Chris Komorowski, a champion of C-EnterNet, acknowledged the unique partnership between the two groups: "This is a truly great initiative – a win-win situation, that will benefit all parties involved."

With an agreement in place between the "feds" (i.e. the Public Health Agency of Canada) and the local public health authority (Region of Waterloo), and endorsed by the province (Ontario Ministry of Health and Long-Term Care), the new site coordinator, Nancy Sittler, began her C-EnterNet duties. Nancy, a long-time public health inspector at ROWPH, came to this position with extensive experience in the field of enteric infectious diseases, including with RDIS (the Ontario Reportable Diseases and Information System) and iPHIS (Integrated Public Health Information System).

C-EnterNet and ROWPH worked closely together to begin implementation of the new surveillance initiative. The first task was to collectively create a Standardized Enteric Disease Questionnaire, to be used by public health inspectors, for the follow-up of sporadic cases of reportable en-

teric diseases. This questionnaire, now in use, collects information on 20 risk factors for each case of enteric illness. It supports the detection of enteric disease cases in the community and the response to these cases. Lewinda Knowles, an epidemiologist at ROWPH, works with Nancy to provide the transfer of depersonalized case, risk factor and laboratory data to C-EnterNet's database.

Training and capacity building are integral components of the federal-municipal collaboration necessary to the project's ongoing implementation. Since June 2005, C-EnterNet has worked with ROWPH to provide two workshops for staff, one on "Outbreak Investigations" and a second on "Public Health Microbiology". In addition, in September 2005, Nancy attended the prestigious Canadian Field Epidemiology Program's "Epi in Action" course in Ottawa to enhance her skill set.

Early in 2006, C-EnterNet was excited to finalize agreements with the public, private and hospital laboratories serving the Regional Municipality of Waterloo to increase the level of subtyping that is performed on pathogens isolated from enteric cases, in order to transform the

existing passive surveillance system into an active one.

C-EnterNet looks forward to continued collaboration with ROWPH over the next few years, to strengthen front-line public health and to ultimately provide more accurate information on enteric disease occurrences and source attribution at the national level.

## A note from C-EnterNet's Site Co-ordinator, Nancy Sittler

*"Launching the new C-EnterNet enteric questionnaire"*

One of the first tasks following the formalization of the collaboration was to develop an Enhanced Enteric Worksheet questionnaire that met the needs of both ROWPH and C-EnterNet. The goal of the standardized questionnaire was three-fold: it had to standardize the interviewing process, to be disease-specific and to be user-friendly.

Questionnaires used by different organizations were reviewed. The enteric worksheet from the US Centers for Disease Control and Prevention's (CDC's) FoodNet site

**Manager Chris Komorowski celebrates the launch of C-EnterNet at ROWPH**





**Public Health Inspectors sharpen their epidemiological skills at C-EnterNet Training Workshop: October 2005.**

in Minnesota was ultimately used as a template.

The new questionnaire needed to balance the need to provide enough detail to collect the pertinent information about potential risk factors, on one hand, and to be short enough for clients not to be overwhelmed. Previously, ROWPH's enteric worksheets had included items required by the RDIS, and had been developed to enhance the flow of interview questions by the public health inspectors. Although the RDIS worksheets collected the required information, they were not used in a standard manner by different interviewers and they often lacked the detailed information needed for further analysis. With the launch of iPHIS (the Integrated Public Health Information System) in Ontario, there were changes in the items that were required to be reported to the Ministry, so the timing was perfect for the development of a new, better worksheet (questionnaire).

Public health inspectors fully participated in the development of the worksheet. Their feedback regarding the length and flow of the questionnaire were incorporated into re-

visions. The questionnaire has been updated to reflect disease-specific incubation periods. In addition, a four-day food consumption history has been added, in part due to the lessons learned from the recent *Salmonella* PT13 outbreak related to mung bean sprouts. The end result will be enhanced risk-factor information for C-EnterNet, while ROWPH will potentially be able to detect local outbreaks and respond earlier.

### **A note from C-EnterNet's Water Component Lead, Katarina Pintar**

*"Spring, an important time of year to be sampling in the watershed"*

The spring of 2006 brings snow, ice melts, and rain... and a perfect time to be sampling in the Grand River watershed. Part of the C-EnterNet Water component's goal is to evaluate the types of enteric pathogens that are present in the watershed, which is a source of drinking water for the Region of Waterloo and an important site for a number of recreational activities during the warmer months of the year.

The Water component of the C-EnterNet surveillance program has now been operational since the fall of 2005. To date, we've hired a microbiologist technician through our partnership with the Canadian Water Network and the University of Waterloo's (UW) NSERC Chair in Drinking Water Treatment, and we've initiated culture-based and molecular-based pathogen analysis of more than 150 surface water samples.

Currently, C-EnterNet (through the UW partnership) collects water samples at five sites along the Grand River every two weeks. The British Columbia Centre for Disease Control is also involved in this collaboration; it is performing the parasite detection and genotyping analysis for a portion of the samples collected.

By the end of March 2006, we will have the results from a random, telephone-based survey of the residents in the Region of Waterloo regarding their drinking water consumption patterns. These results will help to inform further activities in partnership with the regional water utility and the public health unit. In addition, a water survey of private wells that is being done in partnership with ROWPH will soon be completed.

New ventures in 2006 will investigate further funding opportunities to expand some of the subtyping of the target pathogens, continue relationship building with local stakeholders, and initiate the analyses of the rich data that are being collected.



*A particularly icy sampling day on the Grand River in the Region of Waterloo pilot sentinel site*

## **A note from C-EnterNet's Retail and Agri-Food Component Lead, Dr. Angela Cook**

*"An update on retail and on-farm sampling"*

C-EnterNet's retail food program focuses on raw meats – pork, chicken and beef – all of which have the potential to be contaminated with pathogens that can result in enteric disease in humans. In June 2005, we began sampling at retail stores in our pilot site. Grocery stores in the sentinel site area are selected randomly from a census of all food retailers in the sentinel site area, including large and small retail food outlets. Each week, our field sampler visits two large stores and one small store. A single sample of the top three retail meat commodities consumed by Canadians is purchased from each store, for a total of nine samples per week, or 450 per year. The same cuts of meat are selected each week: fresh ground beef, pork chops and chicken breasts with skin. Sampling is conducted continuously throughout the



year, which provides us with additional insight into seasonal trends.

In April 2005, C-EnterNet began sampling on swine farms in our first sentinel site. This surveillance activity was developed in coordination with the University of Guelph and the Ontario Veterinary College. It will help to determine the level of pathogen contribution to the environment that reaches the Canadian population through food animals. The farms are visited three times a year. C-EnterNet is now expanding into the dairy sector: we will be sampling on dairy farms in the Region of Waterloo starting in March 2006, again in partnership with the Ontario Veterinary College.

Health Canada's Bureau of Microbial Hazards is an important partner in the retail and on-farm activities, providing expert scientific analyses of both the retail and on-farm samples

for viruses and parasites... This partnership promises to be a rich source of opportunities in the future, and it is leveraging Agricultural Policy Framework funds to increase the level of data we can collect on the target pathogens!

## **A note from C-EnterNet's Lead Analyst, Dr. André Ravel**

*"Source attribution is at the heart of C-EnterNet"*

In the context of gastrointestinal diseases, source attribution is the process of determining what proportion of cases of a particular enteric disease (e.g. campylobacteriosis, salmonellosis, etc.) is acquired from a given source (e.g. cheese, apple cider, bean sprouts, beef, chicken, etc.) and through a given transmission pathway (food, water, animals, other humans).

Source attribution is of importance to public health because it allows for the ranking of enteric diseases according to their main source and transmission route. This information, in turn,

*Visiting a swine farm in our first sentinel site*

helps focus resources to improve food safety, water safety and enteric disease prevention with the greatest and most cost-effective impact on public health.

Micro-organisms are highly adaptable and evolve rapidly. In recent years, the human world has also changed significantly and rapidly, with increased urbanization, aging, global travel, international trade of food and animals, and global warming (which leads to more extreme meteorological events). These factors create an ideal environment for the emergence of new pathogens, sources of infection and transmission pathways. As a result, source attribution results may change over time and must be continuously updated using the latest health surveillance data. Thus, source attribution has become a vital component of any enteric disease surveillance system.

The methodology of source attribution is recognized as a scientific challenge by infectious enteric disease surveillance programs around the world. While several methods exist, none is sufficiently accurate on its own. C-EnterNet's goal is to build on the most relevant approaches currently available, and to work with Canadian and international collaborators to improve those methods in order to achieve reliable source attribution outputs in the Canadian context. C-EnterNet has reviewed methodologies for source attribution. It also has compiled source attribution values for enteric diseases as estimated by various teams worldwide.

One conclusion drawn to date is that those estimated values are seldom comparable, because of the absence of a common framework for food categories and of a breakdown of enteric cases (excluding / includ-

ing waterborne cases, travel-related cases, outbreak cases). Thus, C-EnterNet, in collaboration with federal and provincial partners, is developing a general conceptual framework that will provide a common basis for further discussions and scientific activities related to source attribution in Canada.

C-EnterNet hopes to attend the international conference on Priority Setting of Foodborne and Zoonotic Pathogens that will be held in Berlin, Germany, next July ([http://www.medvetnet.org/pdf/Poster/priority\\_poster\\_final.pdf](http://www.medvetnet.org/pdf/Poster/priority_poster_final.pdf)). This event, organized jointly by the European MED-VET-NET Network of Excellence and the US Food Safety Research Consortium, will provide a unique opportunity to share information and thoughts with the most distinguished experts on source attribution.

### **A special note of thanks to C-EnterNet's funding partners and stakeholders:**

- Agriculture and Agri-Food Canada
- Public Health Agency of Canada
- Region of Waterloo Public Health
- Ontario Ministry of Agriculture, Food and Rural Affairs
- Canadian Water Network
- NSERC Chair in Drinking Water Treatment, University of Waterloo
- Grand River Conservation Authority
- University of Guelph, Ontario Veterinary College
- Ontario Ministry of Health and Long-Term Care's Central Public Health Laboratory and London Public Health Laboratory
- Public Health Agency of Canada's National Microbiology Laboratory
- Grand River Hospital Laboratory
- MDS Laboratory Services
- Canadian Medical Laboratories
- Gamma-Dynacare Laboratories

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