



C-EnterNet News

Volume 9, Winter 2010/2011

C-EnterNet - Canada's National Integrated Enteric Pathogen Surveillance System

Editor's Note

In 2010, C-EnterNet expanded to its second sentinel site in the Fraser Health Region of British Columbia (B.C.). Working closely with partners at the Fraser Health Authority (FHA) and the BCCDC Public Health Microbiology and Reference Laboratory (BCPHMRL), and with support from the British Columbia Centre for Disease Control (BCCDC), the site was launched with a celebratory event in June 2010.

Data collection is complete for the Healthy Control Study in Sentinel Site 1. The data from this survey are currently being analyzed descriptively, and will be used along with the Region of Waterloo (ROW) cases to undertake case-control analyses in 2011.

C-EnterNet continues to emphasize knowledge translation with focused efforts to inform policy through publications, stories, workshops and close collaboration with our stakeholders.

I hope that you enjoy reading about the activities highlighted in this newsletter. Feel free to contact us for further information.

Dr. Frank Pollari
C-EnterNet Program Lead

In this issue:

- o Editor's Note
- o C-EnterNet Central
- o Sentinel Site 1
- o Sentinel Site 2
- o Retail Food & Agriculture
- o Water
- o Source Attribution
- o Knowledge Translation

Note from C-EnterNet Central

On June 10, 2010, the Public Health Agency of Canada (PHAC) and its partners met in Burnaby, B.C. to officially launch a second sentinel site for the Agency's C-EnterNet program. "This is a very exciting expansion for the surveillance community in Canada," said Dr. Pollari, C-EnterNet lead. "We at C-EnterNet look forward to taking enteric disease surveillance to the next level through these partnerships in B.C.". During the launch event, the C-EnterNet and FHA members gathered to welcome approximately 40 stakeholders and partners. Guests included members from the BCPHMRL, BCCDC, the Canadian Food Inspection Agency (CFIA) and PHAC's regional office.



C-EnterNet celebrates launch of Sentinel Site 2 with FHA, BCPHMRL and BCCDC, June 2010. From left to right: Jason Stone, Glen Embree, Larry Gustafson, Tim Shum, Judy Isaac-Renton, Frank Pollari, Barb Marshall, André Ravel & Eleni Galanis

The C-EnterNet team continues to focus on knowledge translation activities including participating in the Ontario Foodborne Disease Symposium in Toronto, presenting at the CDC FoodNet Vision meeting in Portland, Oregon, and at the World Congress on Environmental Health (IFEH) in Vancouver.

As well, Dr. Pollari and Andrea Nesbitt, along with the Centre for Food-borne, Environmental and Zoonotic Infectious Diseases (CFEZID) Director, Lisa Landry attended the National *Salmonella* Enteritidis (SE) meeting in B.C. in December. SE is a pathogen of concern in Canada and C-EnterNet is participating in the preparation of a summary paper on SE. This paper collates SE data from various federal surveillance programs targeting SE infections in humans as well as SE contamination in food, animals and the environment. The analysis of data at the phagetype level shows different SE trends over time and explores possible associations with main sources, including chicken and egg consumption and travelling abroad.

The Healthy Control survey in the ROW was completed in August 2010 with a total of 1200 respondents over a 12-month period. The data from this survey is currently at the descriptive analysis stage, and will be used together with the ROW cases to undertake case-control analyses in 2011, beginning with *Campylobacter*. C-EnterNet continues to separate travel from endemic cases and has recently published a paper, *Description and burden of travel-related cases caused by enteropathogens reported in a Canadian community*. (Journal of Travel Medicine, 2011)



Reviewing the 2009 Short Report at Waterloo Workshop, November 2010. From left to right: Nic Crawford, Bernadine Cowie & Ana Estrada

C-EnterNet's "digging deeper model", uses the rich risk factor information obtained from the standardized questionnaires from endemic cases and works closely with its public health partners to make sense of the data that are collected. Sentinel Site 1, in Waterloo, Ontario, has reported double the national and provincial incidence rates for *Cryptosporidium*, and tried to better understand and address this trend. C-EnterNet's research concluded that public pools are a prime transmission zone for *Cryptosporidium* and this helped to inform the development of Ontario Ministry of Health and Long Term Care *Operating Procedures for Non-Regulated Recreational Water Facilities Guidance Document*, which recommends treating water with ultraviolet (UV) light before it enters spray/splash pads to reduce public health risk.

In October, at the invitation of Dr. Céline Gariépy, Dr. André Ravel met with the communicable disease program of the Montérégie regional public health



Waterloo and C-EnterNet celebrate 5th anniversary of Sentinel Site 1, March 2010. From left to right: Yemisi Dare, Nancy Sittler, Marla Rocca, Ken Diplock, Barb Marshall, Peter Heywood, Brenda Miller & Andrea Nesbitt

authority of the province of Québec (Communicable Disease Program, Public Health, Planning and Evaluation Division, Montréal Region of the Minister of Health and Social Services) to update the group on C-EnterNet. The Montréal regional public health authority supports the work of C-EnterNet"

Note from C-EnterNet Sentinel Site 1: The Region of Waterloo and Ontario Agency for Health Protection and Promotion's Toronto Public Health Laboratory

In 2010, Region of Waterloo Public Health (ROWPH) released its "Enteric Disease Status Report: 2005-2009", authored by Amy MacArthur, Brenda Miller and Dr. Hsiu-Li Wang, adding to the body of knowledge related to reportable infectious diseases transmitted by food, water and animals. In addition to illustrating the burden of enteric illnesses in Waterloo Region, the information serves to guide the review and planning of Public Health enteric

disease programs in the future, especially with respect to illnesses where local rates are higher than provincial rates.

Dr. Wang, Associate Medical Officer of Health, is currently acting Director of the Health Protection and Investigation Division and chairs the C-EnterNet and ROWPH Steering Committee. C-EnterNet recognized the retirement of Director, Henry Garcia at the June Steering Committee meeting. Two educational workshops, in March and November were held in collaboration with the Region. In the March workshop C-EnterNet



C-EnterNet visits OAHPP TPHL, July 2010. From left to right: Vanessa Allen, Anne Maki, Frank Pollari & Barb Marshall

and the ROWPH focused on core competencies and celebrated their 5th anniversary with a cake. In November, Dr. Kate Snedeker, University of Guelph, presented on "VTEC and Vaccines: A VTEC Refresher". Nancy Sittler, C-EnterNet site coordinator assisted C-EnterNet and Fraser Health with the implementation of the standardized questionnaire in Sentinel Site 2.

In July 2010, Dr. Pollari and Barb Marshall met with Anne Maki and Dr. Vanessa Allen at the Ontario Agency for Health Protection and Promotion's Toronto Public Health Laboratory for a C-EnterNet update.

Note from C-EnterNet Sentinel Site 2: Fraser Health Authority and BC Public Health Laboratory

Throughout 2010, C-EnterNet collaborated with FHA and BCPHMRL to implement the C-EnterNet program in B.C. Successful implementation and partnership is due to Fraser Health's Tim Shum, Glen Embree, Jason Stone and site coordinator, Rod Asplin. In its first few months, the Fraser Health team helped to launch the new standardized questionnaire and EpiData database. Fraser Health has worked with Dr. Natalie Prystajeky at the BCPHMRL towards integration of the epidemiological and laboratory information. Dr. Prystajeky and Dr. Judy Isaac-Renton have been busy setting up the C-EnterNet lab and procedures and working with Dr. Matthew Gilmour of the National Microbiology Laboratory (NML) on the implementation of molecular typing methods for *Campylobacter*.



C-EnterNet partners from BCPHMRL
From left to right: Natalie Prystajek, Joe Fung, Ana Paccagnella, Judy Isaac-Renton & Linda Hoang

Note from C-EnterNet's Retail Food and Agriculture Component

At the end of 2010, the retail component of C-EnterNet in partnership with the Bureau of Microbial Hazards (BMH) concluded its targeted study looking at bagged leafy greens and the presence of enteric viruses, parasites and bacteria. In total, 748 samples were collected in the first sentinel site (ROW) and 202 samples were collected in the second sentinel (FHA). Complete results will be found in the 2009 and 2010 C-EnterNet annual reports. Results from virus testing on the Ontario samples have been published: *Enteric viruses in ready-to-eat packaged leafy greens* [letter]. (Emerging Infectious Diseases, 2010)

In the fall of 2010, C-EnterNet began a targeted study on retail frozen chicken nuggets, ground turkey and ground chicken in Sentinel Site 1. Samples are being tested for *Salmonella*, *Campylobacter* and *Listeria* presence followed by enumeration and subtyping. Sampling and testing will extend until at least March 2011.

Two new retail studies will begin in 2011. Soft berries (raspberries, strawberries, blueberries and blackberries) will be tested for parasites and viruses in both sentinel sites. C-EnterNet's core retail surveillance activities will expand to the second sentinel site, with the implementation of raw meat (ground beef and skin-off chicken) sampling and testing (*Salmonella*, *Campylobacter* and *Listeria*).

In November, Dr. Angela Cook, in collaboration with FHA and BCPHMRL, presented recent C-EnterNet highlights at the Annual BC Zoonotic meeting in B.C.

In 2010, C-EnterNet's agriculture component, in partnership with the Ontario Veterinary College (OVC) has active sampling of swine, beef, dairy and broiler chicken livestock farms in Sentinel Site 1. This sampling framework provides valuable surveillance information for C-EnterNet and is also being utilized by collaborative partners. For example, in 2010 C-EnterNet collected 120 additional swine manure samples for Dr. Kirsten Mattison, a research scientist at the Food Virology Reference Centre of

BMH for her virus research. In addition, in the summer of 2010 our beef, dairy and swine sentinel farms were utilized to collect samples from resident wildlife as part of a collaborative research project lead by Dr. Claire Jardine at OVC. The samples collected were tested for *Salmonella*, *Campylobacter*, *Yersinia*, *E. coli* and *Clostridium difficile*. To date, this project has provided data and research opportunities for two undergraduate and one graduate student.

Note from C-EnterNet's Water Component

The C-EnterNet water component continues to operate smoothly in Sentinel Site 1, due in large part to the collaboration with the Ontario Ministry of the Environment, who continue to collect the river water samples on a bi-weekly basis. In October of 2010, we welcomed a new Natural Sciences and Engineering Research Council of Canada (NSERC) post-doctoral fellow to the team, Dr. Philip Schmidt, who is working with C-EnterNet's Dr. Katarina Pintar and PHAC Laboratory for Foodborne Zoonoses (LFZ) Aamir Fazil on a joint project with Agriculture Canada, Environment



Angela Cook (left) and C-EnterNet's Sample Procurement Clerk, Alyssia Sunnucks, prepare bagged leafy greens for shipping to BMH



Post-doctoral fellow Dr. Philip Schmidt joins the C-EnterNet team

Canada, and the Ontario Ministry of the Environment. Dr. Schmidt is currently developing watershed quantitative microbial risk assessments (QMRA) to estimate public health risks to both recreational and drinking water exposures in various sites across Canada. We are thrilled to have him join the team!

Note from C-EnterNet's Source Attribution Component

Dr. Ravel continues to lead the development of source attribution analyses for C-EnterNet. The analysis of the expert elicitation survey has been finalized and a first paper detailing the approach and dealing with the proportion of cases attributed to food has been published online, *Foodborne proportion of gastrointestinal illness: Estimates from a Canadian Expert Elicitation Survey*. A second paper, *Food-specific Attribution of Main Gastrointestinal Illnesses According to a Canadian Expert Elicitation Survey*, dealing with food-specific attributable estimates, was submitted in October 2010. Both papers describe the disagreement between experts, but propose valuable point estimates for food attribution in Canada and provide

a sense of the variability around these estimates. Building from this work, Dr. Ravel, in collaboration with Valerie Davidson (University of Guelph), Kate Thomas and Aamir Fazil (PHAC) is working to develop estimates for the number of cases attributable to various food vehicles in Sentinel Site 1. This work will combine data from C-EnterNet, data from National Studies on Acute Gastrointestinal Illness (NSAGI) updated with C-EnterNet data (for under-reporting rates), and the expert elicitation results.

In September 2010, C-EnterNet submitted a grant proposal to the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) to undertake a *Campylobacter* comparative exposure assessment. The application of risk assessment methodologies to quantify the exposure of humans to a given pathogen for various potential sources, and to compare them, is one of the most recent developments in human illness attribution methods. By considering several exposure sources at the

same time, it will provide us with the ability to rank relative risks and more effectively target prevention and control efforts, while also highlighting existing data gaps.

Dr. Ravel is a member of Julie Arsenault's PhD committee (Université de Montréal) which is focusing on the spatial analysis of human campylobacteriosis cases in the province of Québec. The research clearly illustrates the influence of local exposures and risks in rural areas in relation to poultry and cattle production.

C-EnterNet is excited to be hosting a post-doctoral fellow from France, Dr. Julie David, for a two year fellowship with PHAC's LFZ Surveillance Division. Dr. David brings experience and knowledge on source attribution and temporal trend analysis. Her dissertation was on the attribution of the human salmonellosis cases to various food animal commodities in France (<http://tel.archives-ouvertes.fr/docs/00/48/54/41/PDF/Manuscrit-these-JD-190410.pdf>)



André Ravel (middle) attends the 7th Annual International Collaboration of Burden of Illness Studies in Atlanta, July 2010 (also pictured from PHAC, Shannon Majowicz and Nadia Ciampa)

C-EnterNet: Knowledge Translation

Recent Publications and Reports Authored or Co-Authored by C-EnterNet scientists:

Pollari F, Ravel A, Pintar K, Cook A, Marshall B, Nesbitt A, Smith K. *C-EnterNet 2009 Short Report*.

Pham MT, Jones AQ, Sargeant JM, Marshall BJ, Dewey CE. *A qualitative exploration of the perceptions and information needs of public health inspectors responsible for food safety*. BMC Public Health. 2010; 10:345.

Ravel A, Smolina E, Sargeant JM, Cook A, Marshall B, Fleury M, Pollari F. *Seasonality in Human Salmonellosis: Assessment of Human Activities and Chicken Contamination as Driving Factors*. Foodborne Pathogens and Disease. July 2010; 7(7): 785-794.

Arsenault J, Berke O, Michel P, Ravel A, Gosselin P. *Environmental characteristics associated with campylobacteriosis: accounting for the effect of age and season*. (Submitted in August 2010).

Ravel A, Davidson V, Nguyen T, Ruzante J, Fazil A. *Food-specific Attribution of Main Gastro-intestinal Illnesses According to a Canadian Expert Elicitation Survey*. (Submitted in October 2010).

Mattison K, Harlow J, Morton V, Cook A, Pollari A, Bidawid S, Farber JM. *Enteric viruses in ready-to-eat packaged leafy greens* [letter]. Emerging Infectious Diseases. 2010 Nov;16(11):1815-1817.

Arsenault J, Michel P, Berke O, Ravel A, Gosselin P. *How to choose geographical unit in ecological studies: proposal and application to campylobacteriosis*. (Submitted in November 2010).

Arsenault J, Michel P, Berke O, Ravel A, Gosselin P. *Environmental and demographic risk factors for campylobacteriosis: do various geographical scales tell the same story?* (Submitted in November 2010).

Ravel A, Davidson V, Ruzante J, Fazil A. *Foodborne proportion of gastrointestinal illness: Estimates from a Canadian Expert Elicitation Survey*. Foodborne Pathogens and Disease. 2010; 7(12): 1463-1472.

Conferences and Meetings Attended:

- The Canadian Partnership for Consumer Food Safety Education board meeting January 2010, Ottawa, ON

- ROWPH Steering Committee meeting January 2010, Waterloo, ON

- Guelph Food Safety meeting January 2010, Guelph, ON

- ROWPH Community Service Committee meeting January 2010, Waterloo, ON

- Meetings with FHA, BCCDC, BCPHMRL February 2010, Vancouver, BC

- Advisory Committee teleconference February 2010

- Multi-Agency Foodborne Investigation and Management: An Ontario Symposium March 2010, Toronto, ON

- Ontario Waterworks Spring Symposium March 2010, Vaughn, ON

- Core Competencies Workshop # 9 March 2010, Waterloo, ON

- Development of Network for Early Warning and Integration of Knowledge for Zoonotic Diseases Workshop April 2010, Ottawa, ON

- Canadian Public Health Lab Network teleconference April 2010

- CFIA Surveillance Emergency Response meeting May 2010, Guelph, ON

- OMAFRA Food Safety Research Forum meeting May 2010, Guelph, ON

- ROWPH Steering Committee meeting May 2010, Guelph, ON

- Environment Canada KT meeting May 2010, Burlington, ON

- PulseNet and Foodborne Epi meeting May 2010, Winnipeg, MB

- CFIA Produce meeting May 2010, Guelph, ON

- BCPHMRL meeting June 2010, Vancouver, BC

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> • C-EnterNet BC Launch of Sentinel Site 2, FHA June 2010, Burnaby, BC | <ul style="list-style-type: none"> • Surveillance Strategic Planning meeting September 2010, Guelph, ON | <ul style="list-style-type: none"> • The Canadian Association of Veterinary Epidemiology and Preventive Medicine (CAVEPM) May 2010, Guelph, ON |
| <ul style="list-style-type: none"> • National Collaborating Centre for Environmental Health (NCCEH) meeting at BCCDC June 2010, Vancouver, BC | <ul style="list-style-type: none"> • PHAC Research Forum September 2010, Ottawa, ON | <ul style="list-style-type: none"> • C-EnterNet Program Overview June 2010, Guelph, ON |
| <ul style="list-style-type: none"> • Canadian Institute of Public Health Inspectors (CIPHI) Educational Conference June 2010, Guelph, ON | <ul style="list-style-type: none"> • Guelph Food Safety Symposium September 2010, Guelph, ON | <ul style="list-style-type: none"> • 7th Annual International Collaboration of Enteric Disease 'Burden of Illness' Studies meeting July 2010, Atlanta, GA |
| <ul style="list-style-type: none"> • The Canadian Partnership for Consumer Food Safety Education (CPCFSE) Annual General Meeting June 2010, Ottawa, ON | <ul style="list-style-type: none"> • CFEZID staff retreat September 2010, Kingston, ON | <ul style="list-style-type: none"> • BCCDC July 2010, Vancouver, BC |
| <ul style="list-style-type: none"> • Food-and Waterborne Diseases and Zoonoses (FWD) Surveillance Network meeting June 2010, Dublin, Ireland | <ul style="list-style-type: none"> • LFZ Science & Planning Retreat October 2010, Toronto, ON | <ul style="list-style-type: none"> • International Conference on Emerging Infectious Diseases July 2010, Atlanta, GA |
| <ul style="list-style-type: none"> • New Zealand Food Safety Authority meeting June 2010, Guelph, ON | <ul style="list-style-type: none"> • Meeting with the Communicable Disease Program, Public Health, Planning and Evaluation Division, Montérégie Region of the Minister of Health and Social Services, Province of Quebec October 2010, Longueuil, QC | <ul style="list-style-type: none"> • Nova Scotia Health Promotion & Protection teleconference August 2010 |
| <ul style="list-style-type: none"> • The Systematized Nomenclature of Medicine (SNOMED) course June 2010, Ottawa, ON | <ul style="list-style-type: none"> • ROWPH Steering Committee meeting October 2010, Waterloo, ON | <ul style="list-style-type: none"> • Eco Health 2010 September 2010, London, UK |
| <ul style="list-style-type: none"> • Nova Scotia Dept of Health teleconference August 2010 | <ul style="list-style-type: none"> • FPTFSC Enhanced Surveillance Oversight Working Group meeting November 2010, Ottawa ON | <ul style="list-style-type: none"> • Guelph Food Safety Seminar Series September 2010, Guelph, ON |
| <ul style="list-style-type: none"> • Meeting with Sentinel Site 2 September 2010, Vancouver, BC | <ul style="list-style-type: none"> • Canadian SE Control meeting December 2010, Vancouver BC | <ul style="list-style-type: none"> • IFEH September 2010, Vancouver, BC |
| <ul style="list-style-type: none"> • World Congress on Environmental Health (IFEH) September 2010, Vancouver, BC | <p><i>Presentations and Posters:</i></p> | |
| <ul style="list-style-type: none"> • Vose Risk Analysis course September 2010, Ghent, Belgium | <ul style="list-style-type: none"> • US Centre for Disease Control Foodborne Diseases Active Surveillance Network (FoodNet) Vision Meeting March 2010, Portland, OR | <ul style="list-style-type: none"> • 13th Federal Food Safety and Nutrition Research meeting November 2010, Gatineau, QC |
| <ul style="list-style-type: none"> • Canadian Animal Health Coalition teleconference September 2010 | <ul style="list-style-type: none"> • CFIA Professional Update course May 2010, Guelph, ON | <ul style="list-style-type: none"> • 10th Annual Zoonotic Conference November 2010, Vancouver, BC |

Looking Ahead:

2009 Long Report
2010 Short and Long Report

*** Look for these on our website,
newly formatted for easier
access to reports.**



C-EnterNet Team 2010

From left to right: Kevin R Smith, Connie Bernard, André Ravel, Katarina Pintar, Frank Pollari, Andrea Nesbitt, Angela Cook & Barb Marshall

For further details on C-EnterNet, please contact:

Anglophone spokesperson

Dr. Frank Pollari
Program Lead
C-EnterNet Surveillance
Centre for Food-borne,
Environmental and Zoonotic
Infectious Diseases (CFEZID)
Public Health Agency of Canada
Tel. : (519) 826-2184
Fax. : (519) 826-2244
frank.pollari@phac-aspc.gc.ca

**[www.phac-aspc.gc.ca/
c-enternet/index-eng.php](http://www.phac-aspc.gc.ca/c-enternet/index-eng.php)**

Porte-parole francophone

Dr. André Ravel
Surveillance C-EnterNet
Laboratoire de lutte contre les
zoonoses d'origine alimentaire
Agence de santé publique du Canada
Tél. : (450) 773-8521, poste 0144
Fax. : (450) 778-8129
andre.ravel@phac-aspc.gc.ca

**[www.phac-aspc.gc.ca/
c-enternet/index-fra.php](http://www.phac-aspc.gc.ca/c-enternet/index-fra.php)**