



# PHAC/CIHR INFLUENZA RESEARCH NETWORK

2013 ANNUAL REPORT



**PCIRN**

PHAC/CIHR Influenza Research Network

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## ABOUT PHAC/CIHR INFLUENZA RESEARCH NETWORK (PCIRN)

PCIRN was launched through a three-year grant of \$13.9 million from the Public Health Agency and CIHR in 2009. The network was originally designed to carry out a three year plan to develop and test procedures for evaluating a pandemic vaccine using seasonal influenza vaccine as a model. Following the declaration of the pandemic that same year, the investigators of the new network immediately revised research plans in order to evaluate the H1N1/09 vaccine. PCIRN was formed to consolidate the existing expertise in vaccine evaluation; increase the capacity to rapidly test candidate vaccines; create and strengthen links and facilitate two-way knowledge exchange amongst vaccine evaluation researchers and decision makers, and train the next generation of pandemic preparedness and influenza researchers.

In February 2012, network investigators successfully participated in a directed grant application offered by CIHR and PHAC, for an additional three years of funding of \$4.5 million, to 2015. In addition to public health funding, PCIRN has successfully leveraged its network to welcome substantial support from industry for a variety of studies since 2009.

PCIRN currently represents over 90 investigators at more than 30 institutions, including universities, hospitals, and provincial and regional agencies across Canada. Since its inception, PCIRN has initiated more than 40 research studies through its sub-networks, several of which are long-term studies moving into their fifth year of operation in 2013.



## LETTER FROM THE MANAGEMENT COMMITTEE

During its first three year term from 2009-2012, PCIRN achieved substantial impact on Canadian influenza research and earned national and international recognition for its methods and outcomes. A total of 15 peer-reviewed publications, 71 scientific presentations, and 13 reports and summaries were produced during this time; 19 research trainees were also supported by the network.

In early 2012, PCIRN Investigators were invited by the Public Health Agency and CIHR to participate in a directed grant opportunity for \$4.5 million over three years (2012-15). We were successful in our application and obtained our new funding in the spring of last year.

The objectives of the network were clearly outlined in the grant opportunity, and our stated goals as a network are to:

- Continue to perform vaccine research to inform health policy in Canada
- Maintain an active research network capable of response to infectious disease threats in Canada
- Further develop collaborations between Canadian vaccine experts
- Train the next generation of pandemic influenza and vaccine researchers
- Perform applied public health research and vaccine evaluations of high priority for Canadian health decision makers

As part of our evolution as a network, our Management Committee proposed a restructuring of the network to better capitalize on our expertise and to leverage cross-study opportunities. PCIRN continues to operate as a “network of networks” through its six main arms:

- Clinical Trials Network, led by Dr. David Scheifele and Dr. Mark Loeb
- National Ambulatory Network, led by Dr. Julie Bettinger

- Special Immunization Clinics Network, led by Dr. Gaston De Serres
- Serious Outcomes Surveillance (SOS) Network, led by Dr. Shelly McNeil and Dr. Melissa Andrew
- Program Delivery and Evaluation Network, led by Dr. Jeff Kwong
- Reference Laboratory Network, led by Dr. Brian Ward

The restructuring of our core operations has been enhanced with the addition of several new Principal Investigators who are voting members of our Management Committee. In addition we have formed a new Research Oversight Committee comprising five international experts, and our new Stakeholders Advisory Committee, which includes more than 20 members from provincial and territorial public health as well as industry.

PCIRN is indeed well positioned to move forward with our objectives of creating a sustainable and valuable long-term enhancement to Canada’s research landscape. As we conclude our fourth year of operations, we want to again extend a thank you to all of our co-investigators whose efforts have resulted in another year of important influenza research in Canada.

### **PCIRN Management Committee, March 2013**

**Dr. Scott Halperin, NPI**

**Dr. Melissa Andrew, PI**

**Dr. Julie Bettinger, PI**

**Dr. Gaston De Serres, PI**

**Dr. Jeff Kwong, PI**

**Dr. Mark Loeb, PI**

**Dr. Shelly McNeil, PI**

**Dr. David Scheifele, PI**

**Dr. Brian Ward, PI**

# PCIRN PRINCIPAL INVESTIGATORS

## **DR. SCOTT HALPERIN, NOMINATED PRINCIPAL INVESTIGATOR, PCIRN**

Dr. Halperin is a Professor of Pediatrics and Microbiology and Immunology at Dalhousie University and the Head of Pediatric Infectious Diseases at the IWK Health Centre in Halifax. He has lived in Halifax since 1985 where he is the director of the Canadian Center for Vaccinology. Dr. Halperin is also Co-Principal Investigator of the IMPACT network. His research focuses on the diagnosis, treatment, and prevention of pertussis and other vaccine-preventable diseases.

## **DR. DAVID SCHEIFELE, CO-PRINCIPAL INVESTIGATOR, CLINICAL TRIALS NETWORK**

Dr. Scheifele is one of the original founders of the Vaccine Evaluation Center at the Child and Family Research Institute, and has been the Director for the past 20 years. His many interests include influenza, *Haemophilus influenzae* type b vaccines, pneumococcal infections and vaccines, and meningococcal infections and vaccines. Dr. Scheifele is a founding investigator of IMPACT, a surveillance network of 12 pediatric hospitals across Canada that actively monitors certain vaccine-preventable diseases and adverse events following immunization.

## **DR. MARK LOEB, CO-PRINCIPAL INVESTIGATOR, CLINICAL TRIALS NETWORK**

Dr. Mark Loeb is Professor in the Departments of Pathology and Molecular Medicine and Clinical Epidemiology and Biostatistics at McMaster University. He holds the Michael DeGroot Chair in Infectious Diseases and is Division Director for Infectious Diseases at McMaster University. His research interests include influenza vaccine clinical trials and genetic epidemiologic studies.

## **DR. JULIE BETTINGER, PRINCIPAL INVESTIGATOR, NATIONAL AMBULATORY NETWORK**

Dr. Bettinger is an Assistant Professor at the Vaccine Evaluation Center in the Department of Pediatrics at the University of British Columbia and a Michael Smith Foundation for Health Research Scholar. Her research interests include vaccine safety and vaccine preventable diseases (specifically meningococcal and pneumococcal invasive infections), as well as attitudes and beliefs around immunization uptake and use. She is the epidemiologist for the Canadian Immunization Monitoring Program, Active (IMPACT), an active surveillance network for vaccine preventable diseases and vaccine adverse events in 12 tertiary care pediatric hospitals across Canada.

## **DR. GASTON DE SERRES, PRINCIPAL INVESTIGATOR, SPECIAL IMMUNIZATION CLINICS NETWORK**

Dr. Gaston De Serres is a medical epidemiologist at the Institut national de santé publique du Québec and a professor of Epidemiology at the Faculty of Medicine at Laval University. Dr. De Serres works in the area of control and prevention of infectious disease with a focus on vaccine-preventable diseases and respiratory infections, vaccine effectiveness and vaccine safety.

## **DR. SHELLY MCNEIL, CO-PRINCIPAL INVESTIGATOR, SERIOUS OUTCOMES SURVEILLANCE (SOS) NETWORK**

Shelly McNeil is a Professor of Medicine and an Infectious Diseases Consultant at the QEII Health Sciences Centre in Halifax. Dr. McNeil is cross-appointed as an Assistant Professor of Pediatrics. She is a Clinical Investigator at the Canadian Center for Vaccinology, Halifax, where her research focuses on health policy, the evaluation of vaccine-preventable diseases in the elderly and in pregnant women and in clinical trials of new vaccines targeted at adolescent and adult populations

## **DR. MELISSA ANDREW, CO-PRINCIPAL INVESTIGATOR, SERIOUS OUTCOMES SURVEILLANCE (SOS) NETWORK**

Melissa Andrew is a staff geriatrician and Assistant Professor of Geriatric Medicine at Dalhousie University in Halifax. She completed her MD as well as residency training in Internal Medicine and Geriatrics at Dalhousie University. While a resident, she did a Masters of Public Health at the London School of Hygiene and Tropical Medicine on a Commonwealth Scholarship. In 2011, she completed her PhD in Interdisciplinary Studies at Dalhousie University on subject of social vulnerability in older people.

## **DR. JEFF KWONG, PRINCIPAL INVESTIGATOR, PROGRAM DELIVERY AND EVALUATION NETWORK**

Dr. Kwong has been a Scientist at the Institute for Clinical Evaluative Sciences (ICES) since 2007, and a Scientist at Public Health Ontario since 2011, and is also a family physician at Toronto Western Hospital and an Assistant Professor in both the Department of Family and Community Medicine and the Dalla Lana School of Public Health at the University of Toronto. Dr. Kwong's main research interest is in influenza vaccine and vaccination program evaluation (vaccine coverage, vaccine effectiveness, vaccine safety, vaccination program strategies [e.g., universal, school-based]). Other areas of interest include infectious diseases epidemiology and health services research using linkable data.

## **DR. BRIAN WARD, PRINCIPAL INVESTIGATOR, REFERENCE LABORATORY NETWORK**

Dr. Ward is a professor of Medicine & Microbiology at McGill University and Associate Director of the Research Institute of the McGill University Health Center (Fundamental Science). He is Co-Director of the McGill Vaccine Evaluation Center, Director of the National Reference Center for Parasitology, and Associate Director of the JD MacLean Tropical Diseases Center. His work includes both basic and applied research in the fields of immune responses, immunological correlates of protection and/or adverse events, vaccine development, and parasitology.

# CLINICAL TRIALS NETWORK

**D**uring 2012, the Clinical Trials “RT09” study that compared 3 influenza vaccines in seniors was successfully concluded. Of the 911 participants immunized in the fall of 2011, 898 attended the 6-month follow-up visit in spring of 2012, a remarkable 98% study completion rate. Serologic tests and data analysis were completed over the subsequent months, leading to submission of the final manuscript for publication in early 2013. This study, the largest PCIRN trial to date, involved 9 centers and 4 laboratories, and included 2 nested studies within the main trial.

Initially the Clinical Trials Network had planned to conduct a vaccine effectiveness study in seniors for the 2012–13 season; however, this project was contingent on industry funding which was not obtained. Investigators quickly switched gears to focus on critical support of an existing, underfunded, three-year clinical trial under the direction of PCIRN PI Mark Loeb. Funding from PCIRN for *A Randomized Controlled Trial of Live Attenuated Vaccine versus Trivalent Inactivated Vaccine in Hutterite Children*, enabled the project team to bridge funding gaps and contributed to important aspects of the research.

The best choice of vaccine for vaccinating children in order to achieve herd immunity remains unknown. Given that live attenuated intranasal influenza vaccine (LAIV), confers immunity by inducing natural infection, has about a 50% greater protection against influenza in children compared to TIV, vaccinating children with LAIV as compared to TIV may substantially reduce community transmission of influenza. The goal of this study is to test whether immunizing children in Hutterite colonies with LAIV can significantly reduce laboratory-confirmed influenza in the entire community compared to TIV. Investigators hypothesize that 70% uptake of LAIV compared to a similar uptake of TIV among healthy children and adolescents will reduce

laboratory-confirmed influenza in LAIV colonies by 50% compared to TIV colonies.

The clinical trial of LAIV/TIV in Hutterite Children will continue during the 2013–14 and 2014–15 seasons. Official enrolment and consenting of the Hutterite colonies in Alberta and Saskatchewan began on Oct 22nd 2012. Colonies are randomized as soon as consenting is complete. The colony is only randomized once during initial enrolment but will be re-consented annually. The table below shows the number of colonies and number of participants enrolled by group and province in season 1. 3453 participants have been enrolled from 48 colonies. All 48 colonies will be re-consented and vaccinated for the next season 2013–14.

Serology samples are collected at baseline, post-vaccination for healthy children and at the end of the season, both baseline and post-vaccination serology samples has been completed. End of season blood draws will be initiated after season 1 surveillance is closed. Serology samples will be collected for the next season 2013–2014. CT is hoping to increase enrolment for season 2 of the study, and have implemented few steps such as a monthly newsletter for non-participating colonies to keep them updated on study activities, with research assistants keeping open lines of communication with non-participating colonies, and PI visits to colonies.

In addition to the Hutterite trial, the PCIRN Clinical Trials team is working on development of training and capacity-building projects at its network of clinical trial sites to help enhance performance. Several potential projects using the Clinical Trials network are planned for the 2013/14 including:

- Safety of Flumist in children with CF
- Evaluation of quadravalent influenza vaccine in pediatric patients
- Evaluation of an avian influenza vaccine in adults

## LAIV vs. TIV Enrolment Summary

Province	Colonies Enrolled	Randomized	Vaccinated	Vaccinated Group (VG)	Other Group (OH)
Alberta	31	31	31	661	1659
Saskatchewan	17	17	17	256	877
Total	48	48	48	917	2536

# NATIONAL AMBULATORY NETWORK

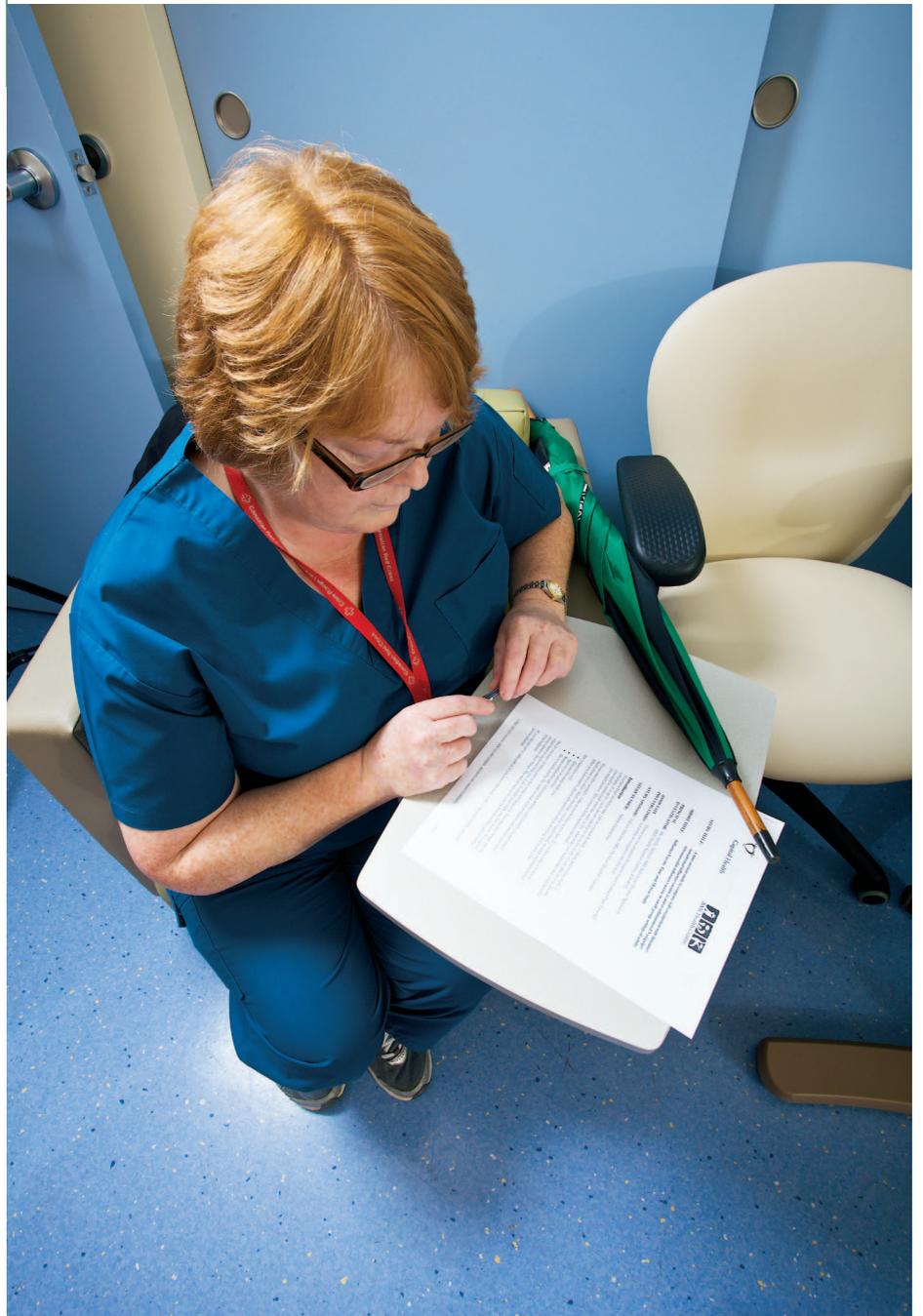
**T**he National Ambulatory (NA) Network was formed by PCIRN in 2012 as a natural evolution of the Vaccine Safety Surveillance study (2009–11). The Network manages eight sub-sites in provinces across Canada and represents a current safety cohort of thousands of Health Care Workers (HCW). Annually, the Network studies Adverse Events Following Immunization (AEFI) shortly after the start of provincial influenza campaigns. The Network managed two studies in 2012–13:

- Active Surveillance of Adverse Events Following Immunization among Health Care Workers Immunized With the Influenza Vaccine
- Active Surveillance of Adverse Events Following Immunization among Children Immunized With the Influenza Vaccine.

In 2012 the NA Network surveillance in health care workers (HCW) was expanded to 8 sites in 5 provinces with almost 9,000 HCW responding to the 7-day safety survey. Additionally, the NA Network pilot tested surveillance in over 1,200 parents of immunized children at one site. In late October 2012, at the request of the Public Health Agency, the network was able to provide an early safety brief to public health after concerns were raised in Italy around the Agriflu vaccine, which contained tiny clumps of virus particles. Early results from the NA Network showed a similar rate of health events in HCW immunized with Agriflu when compared to unimmunized HCW and HCW immunized with other vaccine products.

In 2013–14 the National Ambulatory network will continue its surveillance in HCW and expand surveillance among parents of immunized children and adults 65 years of age and older. The goals this year will be to

increase the participation rate, to expand the number of sites enrolling children (to reach a goal of 10,000 children) and to provide results to public health by early November. As with the HCW group, a control group will be included for the children in order to determine baseline rates for common events.



# SPECIAL IMMUNIZATION CLINICS NETWORK

**T**he Special Immunization Clinics (SIC) Network was introduced as a new PCIRN network as part of the 2012 application for renewed funding, under Dr. Gaston De Serres. Dr. De Serres' success in leading PCIRN studies in both anaphylaxis following immunization and in egg allergic patients vaccinated with influenza vaccine in previous years was a natural precursor to the evolution of such a clinic network.

In 2012–13, the SIC Network was in its first stage and the work was dedicated to recruiting sites, preparing a detailed protocol describing the scope and activities of the SIC Network, preparing the standard forms and the mechanism to collect data on patients, developing the scientific basis for the management of patients and writing a management guide for patients with an adverse event following immunization (AEFI) or potential contraindication to vaccination.

In addition, an extensive literature review was conducted in preparation of the scientific management guide and a review article describing its findings will be written. A face-to-face meeting held in Montreal in February 2013 allowed all site investigators to discuss and agree on the procedures and management of the Special Immunization Clinics. All sites had submitted the protocol to their ethics boards and the SIC Network expects approval by the end of Spring 2013.

The SIC network has 13 sites in 6 provinces. The sites are mostly based in hospitals belonging to the IMPACT network and while the principal investigator in each site is an Infectious Disease specialist, allergists and co-investigators of other specialties will also participate depending upon the AEFI and medical condition to manage.

In 2013–14 the SIC Network will become fully operational and plans to:

- Start the clinical activities of Special Immunization Clinics
- Continue the review of the scientific evidence supporting the various recommendations with the objective of creating a virtual database that will include studies related to the safety of vaccinating patients who had AEFI or those with potential vaccine contraindications
- Write articles summarizing the evidence on the risk of recurrence of AEFI
- Conduct a survey (with the Canadian Pediatric Society) of pediatricians throughout the country to assess the frequency with which they manage patients with challenging AEFI and the need for Special Immunization Clinics to refer difficult cases
- Develop protocols to assess various AEFI (allergic reactions and oculo-respiratory syndrome, large local reactions)
- Expand the collaboration with the Public Health Agency of Canada and the various provincial and territorial ministries regarding the assessment and management of AEFIs
- Expand the collaboration with the networks assessing AEFI from Australia, Italy and the United States



# SERIOUS OUTCOMES SURVEILLANCE (SOS) NETWORK

**T**he Serious Outcomes Surveillance (SOS) Network currently represents 18 surveillance sites, including 43 sentinel teaching hospitals across Canada and 40,000 acute care beds. SOS sites are located in seven provinces – BC, Alberta, Manitoba, Ontario, Quebec, New Brunswick and Nova Scotia. The SOS Network monitors the effectiveness of seasonal influenza vaccines by tracking the incidence and severity of disease in adults hospitalized with influenza, and also assesses the health and economic burden of influenza in Canadian adults, in order to better understand how vaccines can be used to prevent flu in adults and to understand risk factors for more severe disease. The network has recently expanded to include pneumococcal and invasive meningococcal surveillance as well.

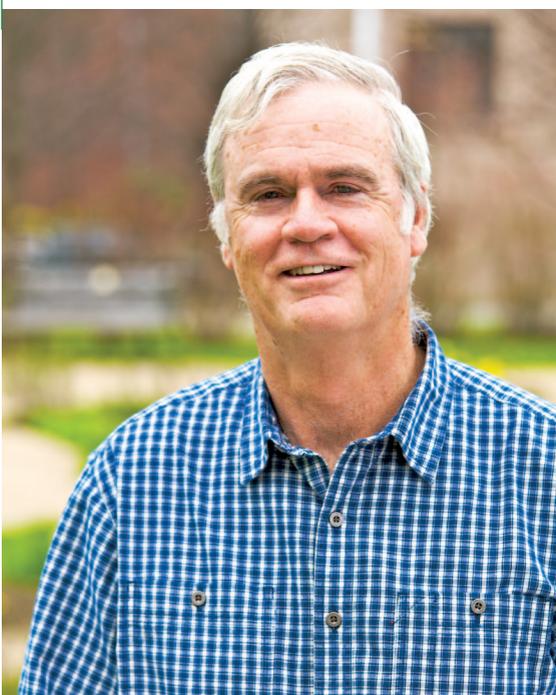
SOS continued active surveillance for influenza and pneumococcal disease over the last year. As of April 2013, there were over 1500 hospitalized influenza positive cases identified within the network. In addition to assessment of serious outcomes related to influenza, this year SOS has also been conducting several sub-studies assessing frailty and immunosenescence in relation to influenza outcomes. In 2012 over 1400 cases of Community Acquired Pneumonia (CAP) were identified and 78 cases of Invasive Pneumococcal Disease (IPD).

SOS entered a new collaboration this season with the Public Health Agency of Canada (PHAC) providing them with weekly reports regarding influenza cases admitted and those resulting in ICU admission or death. These data were incorporated in their weekly FluWatch report.

Approximately 1500 influenza cases and 1800 influenza negative controls were enrolled in the influenza surveillance study. Participant

follow-up and data entry are still ongoing as of this report writing. Early estimates of Vaccine Effectiveness (VE) are consistent with data from other surveillance programs, though no other network evaluates VE against hospitalization and serious outcomes in Canada.

Surveillance for influenza and pneumococcal disease will continue for another year with ongoing funding from GSK and Pfizer. Sub-studies related to frailty and immunosenescence will continue with expanded participation within the network. Ongoing CIHR funding will support additional sub-studies aimed at enhancing the SOS Network Capacity to respond to emerging safety signals. Two protocols are being developed to establish methodologies, tools and resources and training to respond to evaluate relevant Adverse Events of Special Interest (AESI) following immunization. These protocols have the capacity to be amended rapidly if a potential safety signal is reported, and will allow for rapid response capacity as well as providing validation for ICD10 diagnostic coding for relevant AESI's.



# PROGRAM DELIVERY & EVALUATION NETWORK

**T**he Program Delivery and Evaluation (PDE) group undertook six projects in 2012–13. *Integrating Barcode Scanning of Vaccines into Public Health Settings, Phase II*, was conducted in Algoma Public Health in Ontario and First Nations communities in Alberta. Scanning vaccine data into immunization records improved data quality and was well-received by users.

*Parental Perceptions of School-based Influenza Immunization (SBII) in Ontario* saw 55 parents discussing the advantages and disadvantages of adding annual flu shots to school immunization programs. Several issues were identified with on-line recruitment strategies (multiple individual submissions, inaccurate data). Parents understood the benefits of SBII programs but expressed concerns about program delivery.

In the study *Online Perceptions of Measles and Measles Vaccination, Following the 2011 Outbreak in Quebec*, responses to on-line news articles about Quebec's 2011 measles outbreak were analyzed; 20% of individuals expressed negative perceptions of measles vaccination, but contributed 36% of total comments. Public health messages should address this group's concerns by emphasizing that immunization is a personal choice, and that the pharmaceutical industry is strictly controlled.

*Evaluation of the Impact of Leadership in the Pre-implementation Period: 2012 BC Influenza Prevention Policy* saw focus groups held with eight leadership teams in October 2012 to discuss the province-wide policy of influenza immunization or wearing a mask when in contact with patients during influenza season as a condition of service. Key strengths identified included: having a patient safety focus, provincial-level mandate, support of senior leadership, and consistent communications.

With the *Vaccine Sentiment Ontology* study, the team developed an automated method to monitor public attitudes towards vaccination by sampling blog posts on vaccines, manually annotating blog posts to use as a gold standard for automated text extraction, and developing an ontology to model existing knowledge about vaccination in online social media.

The *Healthcare Worker Immunization* study showed that Influenza immunization program planners believe immunization coverage in healthcare workers will continue to be sub-optimal using existing strategies. Although participants discussed mandatory immunization as a way to improve uptake, obstacles need to be addressed for this to be implemented successfully.

For the upcoming 2013-14 year the PDE group has a number of projects planned:

- ***Evaluating the use of Live Attenuated Influenza Vaccine (LAIV) and Trivalent Inactivated Influenza Vaccine (TIV) through School-based Influenza Immunization: a Randomized Controlled Trial*** will determine whether offering LAIV instead of TIV in a school-based setting improves vaccine coverage, as well as compare the costs of these programs, and obtain data to inform a future full-scale RCT.
- ***An Exploration of Public Perceptions of Vaccination Based on Comments in the Social Media*** will analyze responses to on-line news articles about vaccine preventable diseases including but not limited to HPV, pertussis, and seasonal influenza.
- ***A Study of the Impact of ImmunizeON, a new iPhone app, on Maternal Beliefs and Attitudes toward Pediatric Vaccination*** will assess the impact of using a smartphone app on immunization attitudes and provide pilot data for a pragmatic RCT of the impact of the ImmunizeON app versus sham app on on-time vaccination rates.
- ***Mixed Methods Examination of the 2012-2014 British Columbia Influenza Prevention Policy*** is an extension of the work conducted in year 4 to assess the condition of service policy in BC. Researchers will conduct a series of focus groups and surveys of healthcare facilities and healthcare workers to evaluate the implementation of the new policy.
- ***Vaccine Attitude Surveillance using Semantic Analysis (VASSA)*** will work to develop, evaluate, and apply on a large scale an automated method for monitoring on-line sentiments toward vaccines.

# REFERENCE LABORATORY NETWORK

In 2012–13, the Reference Laboratory (RL) Network focused on the maintenance of competence for standard assays and assay support for PCIRN’s various networks, maintenance and development of the PCIRN sample archive (biobank), and field testing and/or use of RL-developed novel assays as investigational tools for improved understanding of immune responses to vaccination or illness.

RL continued to offer lab testing support to other PCIRN themes, supporting clinical research and surveillance efforts. Tests offered included cell-mediated immunity, microneutralization, cross-protection, PCR, and HAI. This latter, a ‘gold-standard’ for influenza testing, continues to be offered in the standardized format established by RL, refined using up-to-date WHO standards, and quality-tested in collaboration with Canada’s leading public health lab, NML. RL labs in Nova Scotia, Quebec, and British Columbia continue to constitute a valuable pandemic preparedness resource for Canada’s public health system, via a geographically dispersed, ‘surge capacity’ for rapid diagnostic testing.

RL continued to maintain the archive of clinical samples established in previous years and to refine related processes, such as database establishment. This invaluable repository provides the means for PCIRN and other Canadian researchers to access valuable, supra-regional biological samples and reagents for future influenza-related research.

The RL-developed miniaturized anti-neuraminidase (anti-NA) assay, presently not available elsewhere in Canada, is now being exploited for investigational uses. (Antibodies to this major surface glycoprotein of influenza are currently not measured routinely and the NA antigen content of seasonal vaccines is not standardized, despite indications that anti-NA antibodies may reduce infection severity and be of special interest in the case of pandemic influenza). RL’s novel IgG avidity assay has been in investigational use for some time, and was the basis of a recent peer-reviewed publication helping to shed light on immune responses to vaccination in children.

In 2013–14, RL will provide continued support for other PCIRN Networks, and provide maintenance and development of the PCIRN sample archive. In addition the RL group is investigating the possibility of several research projects:

- **Exploration of Anti-Neuraminidase Antibody Response to Influenza Vaccine** will use the improved higher-throughput assay developed by RL to investigate anti-NA responses in relation to drift changes in the H1 surface protein.
- **Understanding Influenza B Serology** will systematically compare different approaches to determine an optimal strategy for assessing influenza B virus using the HAI assay.
- **HAI Target Antigen Testing** will study the impact of using different target antigens (egg- vs tissue-culture-adapted, vs wt target antigens) on results of HAI and other influenza tests.
- **Non-Influenza Etiologies in ILI** addresses questions on the causes of ILI and investigates how our usual methods of estimating vaccine efficacy are affected by using this crude measure to select patients for further flu testing.
- HAI assay inherently poses many challenges to between-lab standardization. **Network-wide HAI; Quality Assurance** continues and builds upon previous RL work to standardize HAI protocols and outputs, adding capacity and further rigor.



## PCIRN STUDENTS & TRAINEES

**E**ach year PCIRN welcomes students from across the influenza research spectrum to participate in research projects and to receive funding support through PCIRN. Candidates are nominated by the Principal and Co-Investigators within the network and funding support is contingent on adherence to CIHR-level quality research. Students are encouraged to present their research at the PCIRN Annual Meeting, and also participate in the PCIRN curriculum, a web-based program based on case study discussions, with seminars held monthly.

**MELANIE COURTOT** is a PhD student based at the BC Cancer Research Centre whose research focuses on improving vaccine adverse events reporting. Her general research interest is to make biological and clinical data openly available on the web, and develop required methods to increase their integration and reproducibility.

**SANELA GAJIC** completed her Masters of Applied Health Services Research (MAHSR) at Dalhousie University with collaboration of the Atlantic Regional Training Centre (ARTC). Her thesis work was supervised by Dr. Shelly McNeil and focused on Outlining Healthcare Utilization in Order to Develop Evidence Based Data Collection Tools for Prospective Evaluation of the Economic Burden Due to Invasive Meningococcal Disease (IMD) in Canada.

**AMANDA LANG** is a post-doctoral fellow at Dalhousie University working on new diagnostic tools to detect influenza infections. Research interests include infectious diseases, vaccine development, clinical microbiology, influenza, and Streptococcus pneumoniae

**SARAH MCALPINE** is a post-doctoral fellow at Dalhousie University and her research interests include infectious diseases, immunity, vaccinology, influenza, and pertussis. She is working on evaluating new formulations of vaccines for influenza and pertussis.

**MARIO ANDRES PIZZORNO** is studying the processes underlying influenza genetic variability and antiviral resistance to develop novel preventative and therapeutic

modalities against emerging viruses as part of his PCIRN scholarship and masters at Laval University.

**MIGUEL RETAMAL** is a PhD student at Laval University and his studies are focused on characterization of the surface proteins of pH1N1. Miguel has broad industrial experience in development and production of novel vaccines and drugs and in immunology.

**KATIE YOUNG** holds a CIHR studentship for her PhD work that focuses on the evaluation of immune responses to virus-like particle (VLP) vaccines made in plants. A part of her work at the Research Institute of the McGill University Health Centre is focused on the development of eGFP-tagged VLP to develop novel, high-throughput serologic assays for influenza.

**KAREN YAM** is a post-doctoral fellow at the Research Institute of the McGill University Health Centre where she is developing novel humoral assays (eg: IgG avidity, IgG subclass distribution) to better understand protective immunity following influenza virus infection and influenza vaccination.

**JOSELINE ZAFACK** is a PhD student in epidemiology at the Centre Hospitalier Universitaire de Quebec where she is working on adverse events following immunization (AEFI) to evaluate the risk of of recurrence upon revaccination.

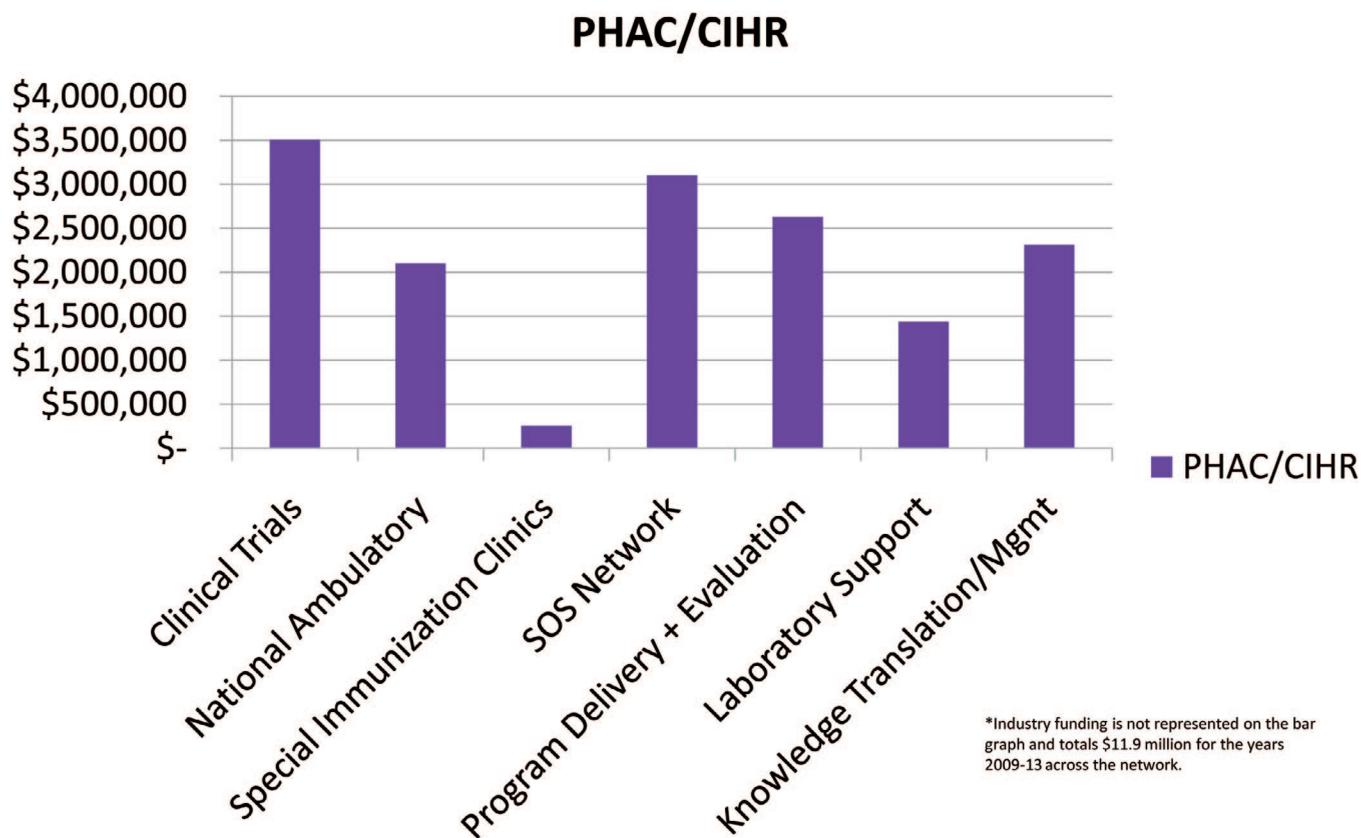


# FINANCIAL REPORT

- Term of original PHAC/CIHR Grant Funding: **April 2009 – March 2012**
- Term of new PHAC/CIHR Grant Funding: **April 2012 – March 2015**
- Total PHAC/CIHR Grant to 2015: **\$18,426,459**
- Grant funding assigned to research studies 2012–13: **\$1,985,441**
- Industry funding assigned to research studies 2012–13: **\$3,667,192**
- Total number of network research studies funded 2009–2013: **60**
- Total number of participating investigators & contributors to date: **122**
- Total number of participating institutions and organizations to date: **35**

## PCIRN FUNDING 2009-2013

Network funding to March 31, 2013: \$26.9 million\*



# PCIRN CO-INVESTIGATORS & CONTRIBUTORS 2012–13

## CLINICAL TRIALS NETWORK

Bjornson, Gordean	UBC/CFRI
Coleman, Brenda	Mt. Sinai
Cooper, Ann	McMaster
Cooper, Curtis	OHRI
Dionne, Marc	Laval
Eskandrian, Sasha	McMaster
Fan, Shuyu	UBC/CFRI
Halperin, Scott	Dalhousie
Hatchette, Todd	Dalhousie/CDHA
Johnstone, Jennie	McMaster
Kollman, Tobias	UBC/CFRI
Lajeunesse, Carol	UBC/CFRI
Langley, Joanne	Dalhousie
Li, Yan	NML
Loeb, Mark (PI)	McMaster
MacKinnon-Cameron, Donna	Dalhousie
Magwood, Reagen	McMaster
Manning, Vanessa	McMasta
Marty, Kim	UBC/CFRI
McElhaney, Janet	AMRIC (formerly UBC)
McGeer, Allison	Mt. Sinai
McNeil, Shelly	Dalhousie/CDHA
Montolmoli, Emmanuelle	Italy – University of Siena
Quach, Caroline	MUHC
Rubinstein, Ethan	U Winnipeg
Scheifele, David (PI)	UBC/CFRI
Vanderkooi, Otto	U Calgary
Ward, Brian	MUHC

## NATIONAL AMBULATORY NETWORK

Bettinger, Julie (PI)	UBC/CFRI/BCCCH
Bowie, Bill	UBC/VGH
De Serres, Gaston	Laval/INSPQ
Fan, Shuyu	UBC/CFRI
Kellner, Jim	U Calgary
MacDonald, Judy	UBC/CFRI
Marty, Kim	UBC/CFRI
McCarthy, Anne	OHRI
McGeer, Allison	Mt. Sinai
McNeil, Shelly	Dalhousie, CDHA
Needham, Judy	UBC/CFRI
Valiquette, Louis	U Sherbrooke/CHUS
Vanderkooi, Otto	U Calgary

## SPECIAL IMMUNIZATION CLINICS NETWORK

Benoit, Melanie	Laval
Boucher, Francois	Laval
De Serres, Gaston (PI)	Laval/INSPQ
De Almeida, Floriana	Laval
Dobson, Simon	UBC
Gariepy, Marie-Claude	Laval
Halperin, Scott	Dalhousie
Jadavji, Taj	U Calgary
Lebel, Marc	Ste-Justine
McNeil, Shelly	Dalhousie/CDHA
Pernica, Jeffrey	McMaster
Pham-Huy, Anne	U Ottawa
Quach, Caroline	MUHC
Rouleau, Isabelle	Laval
Tan, Ben	U Saskatchewan
Tran, Dat	U Toronto
Top, Karina	IWK/Dalhousie
Valiquette, Louis	U Sherbrooke/CHUS
Vaudry, Wendy	U Alberta
Zafack, Joseline	Laval

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ELSherif, May	Dalhousie

Gajic, Sanela	Dalhousie
Katz, Kevin	North York Gen. Hosp
Leblanc, Jason	CDHA
Light, Bruce	St. Boniface Hosp
Loeb, Mark	McMaster
MacKinnon-Cameron, Donna	Dalhousie
McCarthy, Anne	OHRI
McElhaney, Janet	AMRIC
McGeer, Allison	Mt. Sinai
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Poirier, Andre	Trois Rivières Centre Hosp.
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Richardson, David	TIBDN
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Smyth, Daniel	Horizon NB
Taylor, Geoff	U of Alberta
Trottier, Sylvie	Laval
Valiquette, Louis	U Sherbrooke/CHUS
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Guay, Maryse	Sherbrooke
Halperin, Beth	Dalhousie
Hamid, Jemila	McMaster
Henry, Bonnie	Fraser Health
Kolbe, Faron	Toronto PH
Kwong, Jeff (PI)	ICES/PHO
Lam, Po Po	U of Toronto
Loeb, Mark	McMaster
MacDougall, Donna	St. FX
McGeer, Allison	Mt. Sinai Hosp
McPherson, Charmaine	St. FX
Pereira, Jen	PHO
Quach, Susan	PHO
Quan, Sherman	PHO
Ramsay, Hillary	Bruyere
Russell, Margaret	U Calgary
Salvadori, Marina	LHSC
Sander, Beate	PHO
Sider, Doug	PHO
Van Buynder, Paul	Fraser Health
Wilson, Sarah	PHO
Winter, Anne-Luise	PHO
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## REFERENCE LABORATORY NETWORK

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Hatchette, Todd	Dalhousie/CDHA
Kollmann, Toby	UBC
Lang, Amanda	Dalhousie
Li, Yan	NML-PHAC
Pillet, Stephane	McGill
Pizzorno, Andres	CRCHUL
Retamal, Miguel	CRCHUL
Tang, Patrick	UBC
Ward, Brian	MUHC
Yam, Karen	MUHC
Young, Katie	McGill
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## PROJECT MANAGEMENT OFFICE

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Mossman, Jessica	Dalhousie

# PUBLICATIONS, ABSTRACTS, & PRESENTATIONS

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Kwong, JC, on behalf of the PCIRN Vaccine Coverage Theme. PHAC/CIHR Influenza Research Network (PCIRN) Vaccine Coverage Theme Workshop: Optimizing the Collection of Influenza Immunization Data. Presented at: The Ontario Public Health Convention (TOPHC): Joint Conference of OPHA/alPHA/OAHPP;2011 Apr 5-8; Toronto, ON.

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*Theme work is listed chronologically by Publication, Abstract, and Presentation.*



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