

Canadian Immunization Research Workshop

March 25, 2013
Ottawa, ON

Meeting Report



Canadian Institutes
of Health Research

Instituts de recherche
en santé du Canada

Canada

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Background

While immunization rates in Canada are generally high for childhood and adolescent vaccine preventable diseases and there continues to be significant achievements in immunization, it must be recognized that inequitable, incomplete and delayed coverage persist nationwide.

Immunization rates, for both childhood immunizations and seasonal influenza vaccination in people aged 65 and over, are inadequate in Canada to meet public and population health goals. In fact, according to data obtained from the Childhood National Immunization Coverage Survey, vaccine coverage estimates for most routine childhood vaccines remain below national targets set for immunization in Canada.

There have been sporadic outbreaks of measles (9 outbreaks since 2006), mumps and rubella in several jurisdictions, which serve to remind us that Canada is susceptible to imported and endemic vaccine-preventable diseases (VPDs) and that there are pockets of non-immunized or under-immunized populations vulnerable to the introduction of such infectious agents which could lead to disease outbreaks.



Because of its fundamental public health importance, provinces, territories and health professional organizations like the Canadian Paediatric Society, Canadian Medical Association and Canadian Public Health Association expect federal leadership on immunization. Indeed, the Government of Canada has had longstanding roles in regulatory approval, vaccine safety, service to federal populations, national coordination in vaccine procurement and vaccination guidelines, surveillance, outbreak response, funding, and research. However, these stakeholders, as well as the general public, also want the Government to provide guidance regarding how best to use Canada's limited public health resources by facilitating the development and exchange of evidence-based research results that could enhance immunization programs.



¹ <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20158>

Immunization programs cannot be optimized in terms of quality, timeliness, cost-effectiveness and safety unless monitoring, evaluation and research are being carried out. Moreover, there is often a tendency for researchers to work independently in the absence of a formal organizational infrastructure to facilitate collaborative partnerships with their peers. The Government of Canada must ensure that immunization surveillance, research and evaluation are properly targeted to evaluate immunization policies and programs and that infrastructure is available to be called upon quickly in a public health emergency.

Numerous reviews performed by federal, provincial and territorial governments, as well as by academics, industry and non-governmental organizations (the Canadian Association for Immunization Research and Evaluation, Immunize Canada, the Canadian Coalition for Immunization Awareness & Promotion, the Canadian Public Health Association and the Canadian Paediatric Society) have consistently identified the following requirements:

- Strengthened research and evaluation related to immunization programs to support better-informed policy and program decision making;
- Guidance to support parents and health professionals in their responsibilities pertaining to child immunization; and
- Greater focus on special populations (e.g. immigrants, mobile populations, Aboriginal peoples).

Supporting the development of this infrastructure and facilitating access to a rapid research response platform will demonstrate federal leadership in immunization and infectious disease research and response.

Of particular concern is a continuing lack of public and professional confidence in vaccination, in other words hesitancy toward vaccination. Some people worry that vaccines can cause health problems, such as autism or sudden infant death syndrome and are hesitant to have their children vaccinated. Past experience in other countries regarding public concerns over vaccination reveals that trust is not a given and if lost, rates of vaccination might decline to a point where programs become unable to protect against a resurgence of VPDs.



Moreover, the need to address the risk/benefit perceptions of parents is ongoing as there are on average 380,000 new births every year in Canada. Many new parents, who have never experienced a VPD, might not appreciate the potential severity of the risk these diseases pose. Parents' need for more detailed risk/benefit information was one the most frequently stated barriers to informed-decision making according to a public opinion survey².

² Lagarde, F. Summary of Public Opinion on Immunization in Canada. The Public Health Agency of Canada. May 2005.

Workshop Overview



In March 2013, the Canadian Institutes of Health Research (CIHR) and the Public Health Agency of Canada (PHAC) jointly organized a workshop to discuss research priorities related to vaccine-preventable diseases, in areas such as innovation, implementation and public attitudes towards vaccines. The goal of this workshop was to seek input from various researchers and stakeholders to help inform the strategic direction and format of potential future funding opportunities that would support the implementation of a national immunization research program. Specifically, CIHR and PHAC were seeking input on how to address a number of issues related to vaccines and vaccine research in Canada. To ensure that the topics and issues discussed were addressed through a multi-disciplinary approach, workshop invitees came from a variety of disciplines including vaccine biology, clinical research, public health, health policy, and ethics. The secondary objective of the workshop was to provide researchers with an opportunity to meet and develop collaborations.



PUBLIC HEALTH AGENCY *of* CANADA
AGENCE DE SANTÉ PUBLIQUE *du* CANADA

VACCINATION PROGRAMS IN CANADA – JOHN SPIKA, DIRECTOR GENERAL, PHAC CENTRE FOR IMMUNIZATION AND RESPIRATORY INFECTIOUS DISEASES (CIRID)

Dr. Spika began by emphasizing the importance of this workshop for the Public Health Agency, and the high priority that PHAC places on vaccine and immunization program research. A Task Group has been working on developing a new National Immunization Strategy for the past 18 months, and their report and recommendations are currently being circulated at the federal/ provincial/ territorial level. The report contains 15 recommendations in all, which aim to improve the efficiency and eliminate the gaps in the current immunization system, with a focus on innovation and development, program evaluation, and vaccine hesitancy.

Dr. Spika also commented on the importance of program evaluation and reporting, both before and after a new vaccine is introduced to the public. At the moment, the majority of such evaluations are disease-specific, and carried out on an ad-hoc basis. The PHAC-CIHR Influenza Research Network (PCIRN) has been very successful in building national collaborations and rapidly evaluating the pandemic influenza vaccine during the 2009 pandemic. It has also demonstrated an ability to attract additional funding at the provincial level, and from industry. He raised the question of, if additional funding were to become available in this area, whether or not this would be a feasible model for conducting immunization research in general? The need for improved vaccine evaluation was further underlined during a workshop held from November 1-2, 2012, focused on vaccine research, development and innovation. The workshop report listed this as one of its key recommendations.

CIHR-SUPPORTED VACCINE RESEARCH INITIATIVES – MARC OUELLETTE, SCIENTIFIC DIRECTOR, CIHR INSTITUTE OF INFECTION AND IMMUNITY

Dr. Ouellette gave an overview of the investments that CIHR has made in recent years in the field of vaccines, and highlighted several key initiatives within this area. The Canadian HIV Vaccine Initiative (CHVI) is a partnership between the Bill & Melinda Gates Foundation and the Government of Canada (including PHAC, CIHR, the Canadian International Development Agency [CIDA], Health Canada, and Industry Canada), with a total budget of more than \$139 million. CIHR in particular is responsible for the Vaccine Discovery and Social Research component of the initiative. The PHAC-CIHR Influenza Research Network (PCIRN) was created in 2009 through the Pandemic Preparedness Strategic Research Initiative (PPSRI), and was renewed in 2013 for an additional 3 years. Currently, this network is comprised of more than 100 investigators at 30 different research institutions and centres across Canada. In early 2013, International Science and Technology Partnerships Canada (ISTPCanada), the Department of Foreign Affairs and International Trade (DFAIT), CIHR and the Ministry of Science and Technology of the People's Republic of China launched a joint initiative on Human Vaccine Research and Development. The goal of this program is to stimulate innovative research and development projects in the field of vaccine research against infectious diseases in humans that demonstrate high commercial potential. Lastly, as a direct result of the Vaccine Research, Development and Innovation Workshop held in 2012, a meeting was held in March 2013 to discuss the formation of a Canadian Adjuvant-development Consortium. PHAC, CIHR, the National Research Council of Canada (NRC), Health Canada, and members of academia and industry are active partners in these discussions.

Working Session #1 – Evaluation of current Canadian resources and expertise in the area of vaccines and immunization research

Meeting participants were asked to respond to the following questions related to the resources available in Canada related to vaccine and immunization research:

1. *What are the existing teams/groups/networks focused on vaccines and immunization?*
2. *What specific expertise do Canadian researchers have in the areas of vaccines and immunization research?*
3. *What types of research are underway in Canada?*

Participants identified a number of national research networks and organizations currently engaged in vaccines and immunization research, including: the Canadian Association for Immunization Research and Evaluation (CAIRE), *Immunization* Monitoring Program ACTIVE (IMPACT), the National Advisory Committee on Immunization (NACI), the PHAC-CIHR Influenza Research Network (PCIRN), the Pandemic Influenza Outbreak Research Modelling (PanInfORM) team, Mitacs, , and the Sentinel Surveillance Network. There are also numerous research institutions and academic centres, including: the Vaccine and Infectious Disease Organization International Vaccine Centre (VIDO-InterVac), Pan-Provincial Vaccine Enterprise Inc. (PREVENT), the National Research Council of Canada (NRC), the National Microbiology Laboratory (NML), the Institute for Clinical and Evaluative Sciences (ICES), the International Centre for Infectious Diseases (ICID), the National Collaborating Centres for Public Health (NCCPH), the Canadian Centre for Vaccinology (CCV), and the Vaccine Evaluation Centre. In

addition to this are the federal and provincial agencies working on this issue, including: the Public Health Agency of Canada (PHAC), Public Health Ontario (PHO), the Institut national de santé publique (INSP) in Quebec, the British Columbia Centre for Disease Control (BCCDC), Council of Chief Medical Officers of Health (CCMOH), the Pan-Canadian Public Health Network, and provincial Ministries of Health. Canadian researchers also have a breadth of expertise that could be leveraged to support vaccine and immunization research, such as: basic research, health economics, bioethics, modelling, outbreak investigation, pharmaco-epi, clinical trials (standard, public health-focused, and pragmatic), genomics, and information technology.

Overall, the meeting participants felt that Canada has the necessary expertise to examine the various aspects of vaccine and immunization research, but what is lacking is coordination of the different efforts that can be quickly mobilized in the event of a public health emergency. At present, there are no comprehensive evaluation programs for any one vaccine or vaccine-preventable disease. In addition, when creating an inventory of current Canadian resources, it is important to keep in mind that the research networks and entities are not permanent organizations. For example, Canada currently has the capability to conduct clinical trials at 10 centres across the country. They were created in the 1990s when there was a large amount of industry-sponsored activity in Canada, however currently these centres are underused. As the workload decreases, so does the research capacity of individuals able to carry out the trials or train others on how to do them. There is the need to support infrastructure more than we are right now. There are not a lot of Phase I trials of new technologies, but rather it is existing vaccines that are being promoted. There is also the need for increased international collaboration, as national collaboration is fairly successful and well-done.

Working Session #2 – Research Focus Areas

During the second small-group working session, workshop participants were asked to consider the following questions:

1. *What are the most significant gaps in the current research landscape or expertise?*
2. *What should the key priority areas be in the field of vaccine and immunization research?*

The largest and most frequently identified gap is program support research. Canada is among the first countries to adopt new vaccines, but this often means that we lack information about the safety and effectiveness of these vaccines. This is something that Canadian researchers could contribute to easily. Program evaluation includes the entire process from adopting vaccines, making recommendations for at-risk groups, implementation research, the need for additional clinical trials, trials in special populations, and the continued documentation of the vaccine throughout its use. Some of these studies are predictably required, and can be planned in advance. Others, such as those required during a pandemic, would need to be rapidly mobilized. It may go beyond what the federal field epidemiology program currently does, and may require federal/provincial collaborations. Once the results of the studies are in, this information must be accessible to decision makers when needed. Furthermore, there must be a commitment to collecting new data on a regular and consistent basis. There is some stigma around surveillance as a non-science, but it is actually a vital part of the evaluation process and can lead to necessary, secondary research. At the same time, the importance of discovery research should not be marginalized, but rather basic scientists should be made aware of the priorities for Canadians.



Vaccine uptake is also a huge issue that deserves attention. The development of new vaccines is important, but if the public or health care workers are not willing to accept it, then the research community must understand why. Some potential contributing factors were highlighted, including: comfort, complacency, convenience, and confusion, although cost was also mentioned. If health care providers were afforded sufficient time to properly advise patients on the risks and benefits of being and of not being vaccinated against various diseases, the problem of falling vaccine uptake may be mitigated. Related to this, immunization uptake data must be collected and accessible to provide accurate and up-to-date information to decision makers.

There is also data lacking on vaccine efficacy in special populations such as Aboriginals and immigrants. The information that such studies could provide would be very useful to policy- and decision-makers. Similarly, the duration of immunity that many vaccines provide is unknown. Rather, clinical trials move through vaccines that are effective in the short term, but many have diminishing levels of protection over time.

While certain areas such as health economics need increased capacity, overall Canada has a lot of research capacity and expertise in different areas, but the main challenge is pulling all of these aspects together to maximize their effectiveness. The gaps and priorities identified above require a multidisciplinary approach and the participation of experts from different fields.

On the whole, we need to identify where we can make the biggest impact with a new research initiative within the current funding climate and organizational structures, and focus there.

Open Forum Discussion – Implementation ideas

The funding situation at many federal agencies right now, including CIHR and PHAC, does not necessarily provide for large, long-term initiatives. Certain jurisdictions set aside 1-3% of their vaccine sales for evaluation research, and this is one of the recommendations in the new National Immunization Strategy report. Such an approach would allow research agencies to leverage provincial/territorial funding. Health Canada is allocated money from industry for post-market surveillance, and it was suggested that a requirement for vaccine evaluation prior to widespread use should be implemented. Some participants expressed the worry that vaccine manufacturers would increase the price of their vaccine if this condition was applied, which would likely cost more than the 1-3% allocation in the long run. Any studies carried out using these funds could capitalize on existing provincial infrastructure to reduce redundancy.

The CIHR Drug Safety and Effectiveness Network (DSEN) was discussed as a good model of collaborative research involving federal, provincial, academic and industrial researchers. The mandate of DSEN is to increase the evidence on drug safety and effectiveness available to regulators, policy-makers, health care providers and patients, as well as increase the capacity within Canada to undertake high-quality post-market research in this area. A DSEN Query is a focused, well defined question identified by healthcare decision-makers, resulting from a gap in evidence on the safety and effectiveness of prescribed drugs on the Canadian market; and, that can be addressed through DSEN sponsored research. The focus is primarily on prescription drugs, and there seems to be some confusion about whether or not research focused on vaccines is covered under the DSEN mandate.



Workshop participants were asked to consider the research needs and priorities that had been discussed, and to suggest what an entity capable of addressing these priorities would look like. PCIRN is one potential model, and CAIRE is another. While PCIRN has had a great deal of success in the past, in its current phase a minimal amount of resources are allocated to conducting clinical trials. An influx of funding would be required for an adequate response to a pandemic. The National Institutes of Health (NIH) have Vaccine and Treatment Evaluation Units (VTEUs), and are a resource for conducting clinical trials of vaccines and other treatments for infectious diseases. Individual sites compete to be a part of the network, rather than competing on individual project proposals. This mechanism is what helps ensure that high-quality research is conducted.

Above all, any research undertaken must be of high quality, and the entity must be nimble and reactive to rapidly activate necessary research. The goal is to create “rehearsed expertise”, capable of responding quickly during a public health emergency, but which can also inform ongoing programs. It is difficult to conduct research in a time of crisis if you’re not already working in that area. Infrastructure support could be viewed as guaranteed work on a public health issue: a potential network would have a set of priority studies, but the focus could be shifted during a pandemic. In addition, although much of the discussion has centred on clinical trials, that is not necessarily the most important priority for immunization research at this time.

The policy implications of a new research entity must also be considered. PCIRN was set up explicitly to inform public health decisions and to help translate research into policy. The Sentinel Surveillance Network also has provincial decision makers built-in as members of the board to ensure that research is well communicated to the policy makers. In Quebec, the Ministry of Health and Social Services solicits submissions from researchers regarding funding priorities, after which there is an evaluation period when the reviewers can suggest ways in which each project can be improved. Projects are funded based on merit and the amount of funds required/available.

As there is a great deal of research expertise within Canada, an emphasis on poly-functionality would make sense. One suggestion was to create a “network of excellent centres”, that would require research centres to compete to be a part of the network. The number of research centres that would have the expertise to make them competitive in such a competition would be limited, but it is important to keep the competition open. Applicant centres could be biomedical research institutions, public health centres, etc. Standout researchers that are not members of a participating centre could apply as “affiliated researchers”. The ideal number of centres would depend on which questions they are asked to focus on. This is a similar approach to that used for the Canadian Transplantation Research Program. Another suggestion involved running a small competition focused on the design of the network, similar to what was used prior to the formation of the CIHR Institutes. Any investments made should be on a long-term basis, however if that is not possible, the funds should be “start-up” money to build self-sustaining infrastructure.

APPENDIX 1 – WORKSHOP PARTICIPANTS

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APPENDIX 2 – WORKSHOP AGENDA

08:00-09:00 <i>Albion B</i>	Registration
08:00-09:00 <i>Trio Restaurant</i>	Breakfast
09:00-09:15 <i>Albion B</i>	Peter Sherhols , Facilitator, TDV Global Inc. <ul style="list-style-type: none"> • <i>Welcome Remarks and Introductions</i> • <i>Goals of the workshop</i>
09:15-09:40	John Spika , Director General, PHAC Centre for Immunization and Respiratory Infectious Diseases (CIRID) <ul style="list-style-type: none"> • <i>Vaccination Programs in Canada</i> • <i>Overview of the current discussions at the government level focused on vaccine and immunization research</i>
9:40-10:00	Marc Ouellette , Scientific Director, CIHR Institute of Infection and Immunity <ul style="list-style-type: none"> • <i>CIHR programs and initiatives related to vaccines and immunization</i>
10:00-10:30	Small Group Networking Session
10:30-10:45	HEALTH BREAK
10:45-11:45	Working Session #1 – Evaluation of Current Canadian Resources and Expertise in the area of vaccine and immunization research – <i>What do we have?</i>
11:45-12:30	Report Back – Working Session #1
12:30-13:30	LUNCH
13:30-14:30	Working Session #2 – Research Focus Areas – <i>What do we need?</i>
14:30-15:00	Report Back – Working Session #2
15:00-15:15	BREAK
15:15-16:30	Open Forum Discussion – Implementation Ideas – <i>How do we do it?</i>
16:30-16:45	Marc Ouellette , Scientific Director, CIHR Institute of Infection and Immunity <ul style="list-style-type: none"> • <i>Closing Remarks</i>
16:45-17:00	Evaluation of Workshop

APPENDIX 3 – WORKSHOP EVALUATION

Figure 1 – Working Sessions and Open Forum

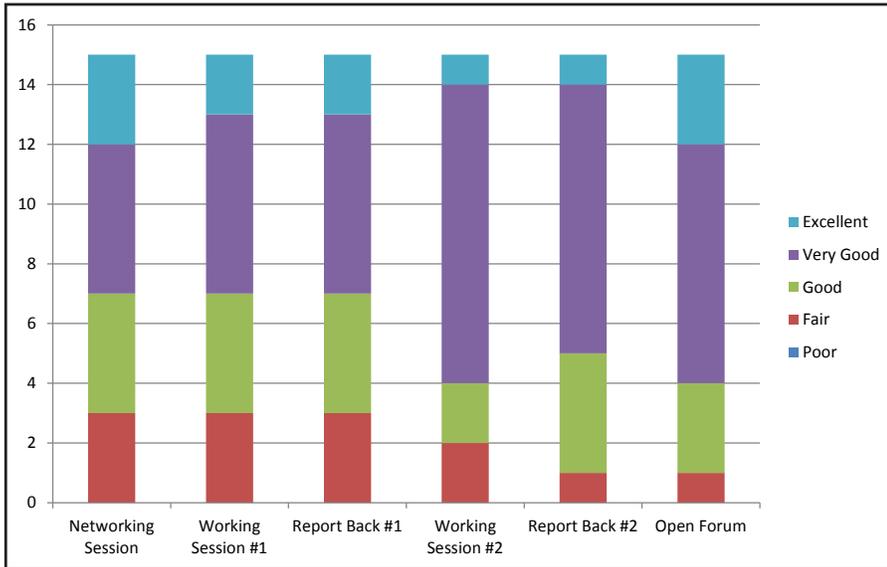
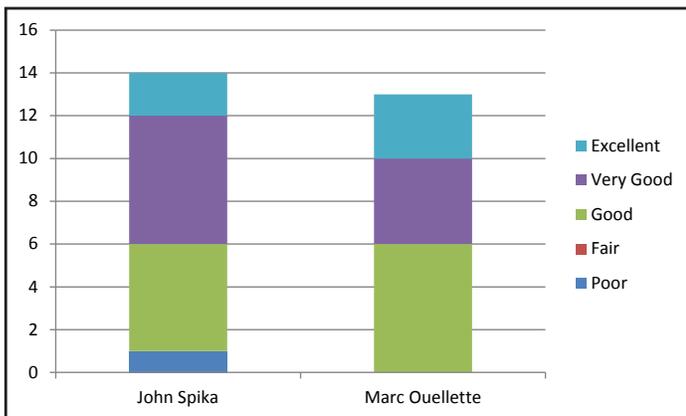


Figure 2 – Opening Talks



APPENDIX 3 – WORKSHOP EVALUATION - CONTINUED

Figure 3 – General

This figure represents the participants' responses to the following questions:

1. Overall, how would you rate the workshop?
2. Did the workshop provide you with the opportunity to discuss important issues in the field of immunization research with your colleagues?
3. Would you support holding similar workshops in the future?

