



CIHR Institute of Infection and Immunity

## Midterm Evaluation of the Pandemic Preparedness Strategic Research Initiative



CIHR IRSC

Institut des maladies  
infectieuses et immunitaires  
Institute of Infection and Immunity



Canadian Institutes  
of Health Research

Instituts de recherche  
en santé du Canada

Canada

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## Executive Summary

### PURPOSE

As part of the Government of Canada's Avian Influenza and Pandemic Influenza (AI/PI) Preparedness Strategy, the Canadian Institutes of Health Research Institute of Infection and Immunity (CIHR-III) was charged with developing and supporting pandemic influenza preparedness research programs. Its Pandemic Preparedness Strategic Research Initiative (PPSRI), with targeted resources from CIHR of \$21.5 million over five years (2006-2011) as well as contributions from partner organizations, supports research intended to improve Canada's ability to prevent and/or respond to an influenza pandemic. This document presents the findings of a formative, midterm evaluation of the PPSRI.

### INFORMATION SOURCES

Evaluation questions focusing on the PPSRI's expected outputs and short-term outcomes were identified with the help of a PPSRI Midterm Evaluation Steering Committee. The following data sources were used to address the questions:

- Review of documentation relevant to program design and delivery;
- Review of administrative data on program outputs;
- Key informant interviews with 22 PPSRI stakeholders;
- E-survey of pandemic researchers (157 respondents, response rate 34%), including successful and unsuccessful applicants to the PPSRI and non-applicants.

### FINDINGS

Overall, the design, delivery and initial outputs of the PPSRI are ensuring that the overall goals for the PPSRI, of improving Canada's pandemic preparedness and of increasing pandemic preparedness research capacity, can be achieved.

Areas identified for additional support or alternative strategies to ensure that they can maximally contribute to the achievement of PPSRI objectives include:

- development of a coordinated international research agenda;
- stimulating pandemic preparedness research with a public health focus;
- facilitating broader engagement of the influenza research community with more elements of the PPSRI's KT strategy;
- capacity development through the engagement of trainees and other strategies;
- communications that more effectively ensure that the research community is aware of the initiative and all its specificities.



The evaluation findings show that the PPSRI has been especially successful in several key areas:

- developing solid and productive partnerships with national agencies;
- developing consensus on research priorities and then implementing tools to address those priorities;
- creating platforms to foster networking and eventual collaboration that are engaging researchers, trainees and potential research users;
- significant resource leveraging for pandemic preparedness research, doubling the funds provided through CIHR.

These strengths provide a solid foundation for continued success as the PPSRI moves forward.



## 1. EVALUATION CONTEXT

### 1.1 Evaluation purpose

In 2006, the Canadian Institutes of Health Research Institute of Infection and Immunity (CIHR-III) was charged with developing and supporting pandemic influenza preparedness research programs. Its Pandemic Preparedness Strategic Research Initiative (PPSRI), with resources of \$21.5 million over five years (2006/07-2011/12), supports research intended to improve Canada's ability to prevent and/or respond to an influenza pandemic.

This document presents the findings of a formative, midterm evaluation of the PPSRI. The aim of the midterm evaluation was to assess the overall design and implementation of the Initiative. It is intended that the results be used to inform future developments in the PPSRI, as well as similar strategic initiatives to be undertaken by III.

The evaluation process has been supported by a Midterm Evaluation Steering Committee, created to provide advice and guidance on the evaluation strategies and processes. Its members and mandate are listed in Appendix 1. The evaluation was guided by a framework developed at the outset of the process and approved by the Committee, based on review of documentation and consultation with III and CIHR staff.

### 1.2 Program profile

#### 1.2.1 Overview of the PPSRI

##### Objectives

The PPSRI is a component of the Government of Canada's Avian Influenza and Pandemic Influenza (AI/PI) Preparedness Strategy<sup>1</sup>, announced in May 2006. Aiming to improve Canada's ability to respond effectively to pandemics and other public health emergencies, the Federal Government committed a total of \$1 billion<sup>2</sup> over five years through the Public Health Agency of Canada, the Canadian Food Inspection Agency, Health Canada, and CIHR. With the overall goals of reducing illness deaths and societal disruption as a result of an influenza pandemic, the AI/PI Preparedness Strategy's specific objectives are:

- To support research that will contribute to evidence-based decision making;
- To ensure that safe and effective vaccine/antivirals are available on a timely basis to all Canadians in the event of a pandemic, including the development of a mock vaccine and build regulatory capacity in this regard;

<sup>1</sup> Avian and Pandemic Influenza (AI/PI) Preparedness Performance Measurement and Evaluation Plan, Final Draft October 2008.

<sup>2</sup> Part of this amount is a contingency fund that would only be provided in the case of a pandemic.



- To establish the organization structures and human resource capacity to support timely and effective planning, decision-making, coordination and action;
- To enhance Canada's ability for the research and development of vaccines and improve the body of knowledge;
- To increase the linkages and coordination of pandemic-related activities across jurisdictions; and
- To reinforce public confidence in Canada's public health system before, during and after a pandemic situation.<sup>3</sup>

The PPSRI's research agenda encompasses a broad range of dimensions of pandemic preparedness. In performance measurement and evaluation terms, the PPSRI is identified in the AI/PI Strategy's logic model as part of the Knowledge Creation and Translation component of the Critical Science and Assessment activity grouping, whose outputs include funded research priorities leading to the immediate outcomes of "Enhanced capacity and response" and "Increased internal and external awareness, knowledge, and engagement."<sup>4</sup>

### Program development process

The PPSRI initiative evolved from information needs identified and issues raised at an Influenza Research Priorities Workshop held jointly by CIHR-III, PHAC and the Canadian Association for Immunization Research and Evaluation (CAIRE) in September 2005<sup>5</sup>. PPSRI program development was facilitated by a five-member Task Group, formed by III upon consultation with its Institute Advisory Board (IAB) and key members of its research community. The Task Group's mandate was: to make recommendations on strategic research priorities and mechanisms; to develop outcome indicators/measures for research; to facilitate research linkages; to identify national and international experts to act as peer reviewers; and to identify partners and obtain funding to support necessary research activities. In particular, the Task Group was charged with developing research priorities specific to pandemic preparedness from those identified at the Influenza Research Priorities Workshop, which had focused on both seasonal and pandemic influenza. The priorities identified by the Task Group were validated through consultation with the Canadian Rapid Research Response Team and additional stakeholders in pandemic-related fields<sup>6</sup>. Strategic priorities retained by the Task Group were:

- Capacity building;
- Vaccines and immunization programs: optimal use and efficiency of existing vaccines and development of new pandemic vaccines;
- The virus: biology of the influenza virus and rapid diagnostics;
- Prevention and treatment: modes of transmission, use of antivirals and alternate strategies for prevention;

<sup>3</sup> Avian and Pandemic Influenza (AI/PI) Preparedness Performance Measurement and Evaluation Plan, Final Draft October 2008, p. 9.

<sup>4</sup> Logic Model for Avian and Pandemic Influenza (AI/PI) Preparedness, June 24 2008, v. 3.7

<sup>5</sup> <http://www.cjhr-irsc.gc.ca/e/30967.html>

<sup>6</sup> Report on the Pandemic Preparedness Research Initiative, Institute of Infection and Immunity, CIHR, <http://www.cjhr.ca/e/32573.html#2>



- Ethics, legal and social contract: research in risk communication, prioritization and the regulatory approval process.

These priorities were then translated into a series of funding opportunities for Canadian and international researchers, made available starting in Fall 2006. An important component of the PPSRI partnership process was inclusion of partners in relevance review to ensure that they could identify applications that aligned with their priorities and mandates as specified in the funding opportunities.

Following usual CIHR procedures, the funding opportunities' applications were adjudicated by peer review committees, among which were five committees created specifically for the PPSRI's core funding opportunities. Most of the funding opportunities included a relevance review process based on peer and partner review of letters of intent.

### Program components

The PPSRI has offered several types of funding opportunities, designed to develop and support: leadership in pandemic preparedness research, collaboration and networking leading to heightened complementarity and critical mass, as well as overall research capacity. Some of the funding opportunities were offered through CIHR's ongoing slate of programs as priority announcements, and others were offered in partnerships with other CIHR institutes and organizations. The program components, totaling 29 in all to date, are summarized in Table 1.

**Table 1: PPSRI program components, in chronological order of due date of full application**

Application deadlines	Funding Opportunities	Objectives <sup>7</sup>	Maximum Amount per Grant and Duration
October 2006	Pandemic Preparedness Operating Grants Funding Opportunity	<ul style="list-style-type: none"> <li>- To address scientific questions/problems related to influenza for pandemic preparedness such as new diagnostic methodologies, evaluation of vaccines, development and evaluation of antivirals, control of disease spread, outbreak modeling, design and assessment of optimal control strategies and social and ethical issues.</li> <li>- To address knowledge translation questions/problems related to pandemic outbreaks such as risk communications and infection control.</li> <li>- To allow researchers to assess the viability of new research directions in the area of influenza for pandemic preparedness or to develop supporting data for high risk research directions.</li> <li>- To address ethical issues related to influenza pandemic preparedness.</li> <li>- To enhance influenza prevention and control strategies for a pandemic outbreak and increase Canada's preparedness and research response capacity.</li> <li>- To explore and address public health and healthcare system integration in areas such as surge capacity, health human resources training and requirements.</li> <li>- To improve linkages between researchers and national or international agencies in order to maximize uptake of research results in preparation for a pandemic outbreak<sup>8</sup>.</li> </ul>	\$250,000 over 2 years

<sup>7</sup> There is no overarching objectives statement for the whole PPSRI; rather, objectives statements were prepared for each of the funding opportunities.

<sup>8</sup> <http://www.cihr-irsc.gc.ca/e/31297.html>

Table 1 continued

Application deadlines	Funding Opportunities	Objectives <sup>9</sup>	Maximum Amount per Grant and Duration
October 2006	CIHR / Regional Partnership Program/Operating Grant: Pandemic Preparedness	- Same as above.	Amount differs by region, over 2 years
October 2006  December 2006	International Opportunities Program - Collaborative Research Project CIHR International Opportunity Program – Development Planning Grant CIHR International Opportunity Program – Development Planning Grant	<ul style="list-style-type: none"> <li>- To enable Canadian researchers to develop new international collaborations and to participate on major international research projects.</li> <li>- To gain access to cutting edge research and technologies that are not currently available in Canada.</li> <li>- To position CIHR as an international player in health research.</li> </ul>	\$25,000 over 1 year
July 2007	Team Grant: Influenza Transmission and Prevention Funding Opportunity*	<ul style="list-style-type: none"> <li>- To address scientific questions/problems related to pandemic preparedness research aimed at innovative ways to study transmission and prevention of influenza, including the study of modes of transmission of the influenza virus and alternate strategies for prevention, including zoonotic transmission, particularly how ecosystem approaches can be applied to understanding the avian-human transmission dynamics in the prevention of human disease.</li> <li>- To create excellent environments for training and development for the next generation of pandemic preparedness and influenza researchers.</li> <li>- To enhance the research capacity in Canada for pandemic preparedness research by integrating trainees into well designed and funded research teams.</li> <li>- To foster collaborations between Canadian researchers and researchers based in middle and low income countries in SE Asia and China.</li> <li>- To address knowledge translation questions/problems related to methods and technology in order to better respond to an influenza pandemic.</li> <li>- To increase awareness of this research by the general public, health care professionals, voluntary health organizations and policy makers.</li> <li>- To develop recommendations for pandemic preparedness planning and control and to disseminate this information to national and international agencies involved in these areas.</li> </ul>	\$1,500,000 over 3 years
December 2006	Workshop/Symposia Support in collaboration with Knowledge Translation Branch	- Support workshops and symposia that are determined to be relevant to pandemic research and that will contribute to pandemic preparedness planning and control.	Workshops: \$5,000 Symposia: \$10,000 Conferences: \$20,000
March 2007  February 2008	Application Development Workshop: Team and Operating Grants Application Development Workshop: Influenza research Network	<ul style="list-style-type: none"> <li>- Enable researchers who are interested in applying for this program, to meet each other and end users, exchange information and discuss areas of common interest with a view to preparing applications.</li> <li>- Assist researchers in gaining an understanding of the application process, and the key components of the application.</li> </ul>	---

<sup>9</sup> There is no overarching objectives statement for the whole PPSRI; rather, objectives statements were prepared for each of the funding opportunities.



Table 1 continued

Application deadlines	Funding Opportunities	Objectives <sup>10</sup>	Maximum Amount per Grant and Duration
March 2007 September 2007 September 2008	Bridge Funding: Pandemic Preparedness Strategic Research Initiative*	- To offer short-term support to researchers who submit excellent research operating grant applications in areas relevant to the Pandemic Preparedness Strategic Research Initiative that are not funded through the regular CIHR funding opportunities to which they were submitted.	\$100,000 over 1 year
May 2007	Applied Public Health Chairs**	In areas relevant to pandemic preparedness: - Support high quality and focused programs of policy and program intervention research of national relevance to public health. - Foster formal linkages with the public health system to support the timely and effective application of research into policies, programs and practice. - Support Canadian universities to develop graduate and continuous education programs in public health. - Stimulate innovative approaches in public health intervention research, mentorship, education and knowledge translation. - Educate and mentor the current and next generation of public health researchers (trainees, post-graduate students and junior faculty), practitioners and policy makers.	\$925,000 over 5 years
June 2007 October 2008	Knowledge Synthesis Grant	- Strengthen knowledge translation by funding research syntheses related to preparing for and responding to an influenza pandemic, with the ultimate goal that new knowledge will allow Canada and others around the world to prevent or mitigate an influenza pandemic or to be better prepared to respond to a pandemic should one arise.	\$100,000 over 1 year
February 2008 June 2008 October 2008	Meetings, Planning and Dissemination Grant: End of Grant KT Supplement*	- For research results that can be translated into new strategies to prevent or mitigate an outbreak and contribute to pandemic preparedness planning and control: To facilitate the uptake of research results through appropriate KT strategies/activities based on the best evidence of effectiveness for the identified target audience(s) following successful completion of a CIHR grant/project.	\$25,000 over 1 year
December 2007 April 2008 August 2008 December 2008	Meetings, Planning and Dissemination Grant: Infection and Immunity*	- To address specific questions or problems important to infection and immunity health research in Canada, with the purpose of reaching a consensus on recommendations or conclusions leading to an improved focus on research issues. - To support scientific educational symposia with areas of importance to a significant number of Canadian investigators and having direct relevance to infection and immunity health research. - To facilitate knowledge exchange through limited support of scientific meetings and conferences with content focused primarily in areas of infection and immunity.	\$25,000 over 1 year
March 2008	Operating Grant: Priority Announcement – Pandemic Preparedness – Transmission, Public Health Measures and Compliance*	- To further strengthen the knowledge base and enhance research capacity in pandemic preparedness research: addressing questions of influenza transmission, the effectiveness of public health control measures and the fostering of compliance with public health control measures.	\$900,000 over 3 years
November 2007	Operating Grant: Pandemic Preparedness Research - Influenza Diagnostics Transmission, Ethics Review and Antivirals*	- To address scientific questions/problems related to pandemic preparedness research focused on innovative ways to optimize use of antivirals, rapid diagnostics, prevention of influenza transmission and the ethics review process. - To create excellent environments for training and development for the next generation of pandemic preparedness and influenza researchers.	\$525,000 over 3 years

<sup>10</sup> There is no overarching objectives statement for the whole PPSRI; rather, objectives statements were prepared for each of the funding opportunities.



Table 1 continued

Application deadlines	Funding Opportunities	Objectives <sup>11</sup>	Maximum Amount per Grant and Duration
		<ul style="list-style-type: none"> <li>- To enhance the research capacity in Canada for pandemic preparedness research by integrating trainees in well designed and funded research projects.</li> <li>- To address knowledge translation questions/problems related to methods and technology in order to better respond to an influenza pandemic.</li> <li>- To contribute to the body of knowledge used in pandemic preparedness planning and control and to disseminate research results to national and international agencies involved in these areas.</li> </ul>	
December 2007	Catalyst Grants: Mobilization of the Research Community	<ul style="list-style-type: none"> <li>- To contribute to Canadian pandemic preparedness by supporting individual researchers or small teams of researchers from Canada's pandemic and influenza research community in their preparation for outbreak research.</li> <li>- To prepare for high-quality research that addresses an important health, health care or health system problem or issue that needs to be examined during an outbreak.</li> <li>- To plan outbreak research projects before a pandemic outbreak occurs.</li> </ul>	\$100,000 over 1 year
January 2008	Team Grant: Pandemic Preparedness - Influenza Biology, Vaccines, Ethics, Legal and Social Research*	<ul style="list-style-type: none"> <li>- To address scientific questions/problems related to influenza vaccines, such as the optimal use and efficiency of existing influenza vaccines, the biology of the influenza virus including the human and animal host response to influenza infection, the animal-human interface, surveillance, risk assessment and modeling, and ethics, legal and social issues related to influenza pandemic preparedness such as risk communication and prioritization.</li> <li>- To create excellent environments for training and development for the next generation of pandemic preparedness and influenza researchers.</li> <li>- To enhance the research capacity in Canada for animal and human pandemic preparedness research by integrating trainees in well designed and funded research teams.</li> <li>- To address knowledge translation questions/problems related to methods and technology in order to better respond to an influenza pandemic.</li> <li>- To develop recommendations for pandemic preparedness planning and control and to disseminate this information to national and international agencies involved in these areas.</li> </ul>	\$1,500,000 over 3 years
March 2008	Partners for Health Systems Improvement Funding Opportunity***	<p>In order to create new knowledge for informed decision making in pandemic planning and policies:</p> <ul style="list-style-type: none"> <li>- Support research that "reflects the emerging health needs of Canadians and the evolution of the health system and supports health policy decision-making";</li> <li>- Support research relevant to decision makers by producing results that can be applied to multiple regions and/or settings;</li> <li>- Foster "collaboration with the provinces and with individuals and organizations in or outside of Canada that have an interest in health or health research" and engage a variety of partners, "in or outside Canada, with complementary research interests";</li> <li>- Promote the "involvement and recognition of, and respect for, health researchers from [an array] of health disciplines"; and,</li> <li>- Enable "the dissemination of knowledge and application of health research to improve the health of Canadians" and strengthen the Canadian health care system (including the public health system).</li> </ul>	<p>CIHR contribution: up to \$150,000 over 3 years</p> <p>Required partnerships funding, ratio depends on province/territory – 2:1 or 1:1</p>

<sup>11</sup> There is no overarching objectives statement for the whole PPSRI; rather, objectives statements were prepared for each of the funding opportunities.



Table 1 continued

Application deadlines	Funding Opportunities	Objectives <sup>12</sup>	Maximum Amount per Grant and Duration
March 2008 March 2009	China-Canada Joint Health Research Initiative – Grants Program Funding Opportunity	<ul style="list-style-type: none"> <li>- To provide support for basic research on viral and bacterial diseases and development of vaccines.</li> </ul>	\$180,000 over 3 years (including National Natural Science Foundation of China (NSFC) contribution)
June 2008	Catalyst Grant: Pandemic Outbreak Team Leader*	<ul style="list-style-type: none"> <li>- To contribute to Canadian pandemic preparedness by identifying high quality team leaders who can bring together research teams in an outbreak.</li> <li>- To support high quality research in the event of a pandemic.</li> </ul>	\$25,000 for 1 year
October 2008	Catalyst Grant: Pandemic Preparedness*	<p>Seed money, on a short-term basis, to:</p> <ul style="list-style-type: none"> <li>- Generate preliminary observations, data or knowledge, or to facilitate team formation, as a first step towards the pursuit of more comprehensive funding opportunities (e.g., operating grants, team grants) by researchers or teams of researchers.</li> <li>- Support original, high quality projects which have the potential to generate high impact results and/or innovative research proposals, research tools, techniques, devices, inventions, or methodologies.</li> </ul> <p>Relevant research areas were:</p> <ul style="list-style-type: none"> <li>- Comparison of protective products (such as masks) and strategies (such as social distancing) that will contribute to effective and innovative methods for prevention of transmission of influenza.</li> <li>- Development of processes, guidelines and standard operating procedures to allow ethics review of applications related to public health threats quickly.</li> <li>- Evaluation of antiviral utilization, effectiveness, adverse effects and resistance in treatment of respiratory infections such as influenza.</li> <li>- Analysis of influenza detection strategies in remote Inuit and First Nations communities and studies of the impact and outcomes of control measures in these communities.</li> <li>- Evaluation of risk for influenza and pandemic influenza, and development of recommendations using scenario analysis in conjunction with mathematical and epidemiological modeling.</li> <li>- Identification of specific populations (e.g., immigrants, people living in low income housing and Aboriginal peoples) most at risk of acquiring an infection.</li> <li>- Effective means to educate health care providers in the application of care guidelines and identify effective protective measures.</li> </ul>	\$100,000 for 1 year
February 2009	Influenza Research Network*	<ul style="list-style-type: none"> <li>- To develop and test methodologies/methods related to the evaluation of influenza vaccines as they pertain to safety, immunogenicity and effectiveness, and program implementation and evaluation;</li> </ul> <p>Expected to contribute to:</p> <ul style="list-style-type: none"> <li>- Consolidating the foundation of existing expertise in vaccine evaluation.</li> <li>- Increasing the capacity to rapidly test candidate vaccines, in the event of a pandemic outbreak, due to the linkages and methodologies developed by the Network.</li> <li>- Creating and strengthening links and facilitating two-way knowledge exchange amongst vaccine evaluation researchers and between vaccine evaluation researchers and decision makers.</li> <li>- Training the next generation of pandemic preparedness and influenza researchers.</li> </ul>	\$10.8 Million over three years

<sup>1</sup> Source: CIHR website, current and archived funding opportunities searches, <http://www.cihr-irsc.gc.ca/e/193.html>.

\*Adjudication included both Relevance Review and Peer Review.

\*\*Adjudication was by Merit Review.

\*\*\*Adjudication included both Merit Review and Peer Review.

<sup>12</sup> There is no overarching objectives statement for the whole PPSRI; rather, objectives statements were prepared for each of the funding opportunities.





### Program resources

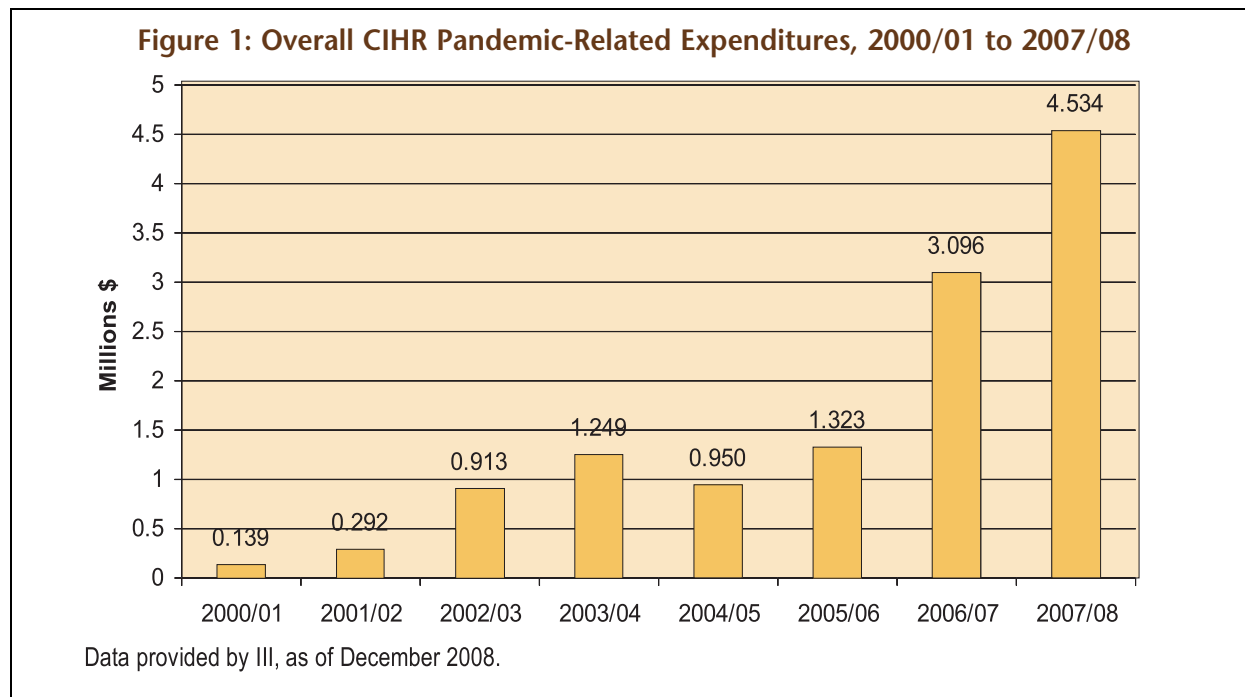
The table below shows funds allocated to pandemic research for the period 2006/07 through 2012/2013 (one year beyond the current PPSRI end date of 2011), including allocations from the PPSRI and the contributions of internal (other CIHR institutes and units) and external partners. The total funds available for allocation over this seven-year period are \$40,267,124; for the period 2006/07 – 2011/12, the total is \$40,112,967.

**Table 2: Pandemic research allocations managed through PPSRI, 2006/07 to 2012/13**

Funding Source	Year							Total
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	
PPSRI Core Funding	2,225,000	2,225,000	5,150,000	5,150,000	5,150,000			\$19,900,000
Internal Partners		365,833	820,000	395,000	332,500	370,000	154,167	\$ 2,437,500
External Partners		1,464,624	1,775,000	5,480,000	5,160,000	4,050,000		\$17,929,624
<b>Total</b>	<b>2,225,000</b>	<b>4,055,457</b>	<b>7,745,000</b>	<b>11,025,000</b>	<b>10,642,500</b>	<b>4,420,000</b>	<b>154,167</b>	<b>\$40,267,124</b>

Data provided by III, as of December 2008.

Figure 1 illustrates CIHR’s overall actual expenditures on pandemic-related research (including expenditures on research funded through regular CIHR open competitions) from 2000/01 through 2007/08. These data show that while CIHR’s expenditures related to pandemic had increased between 2000/01 and 2005/06, the creation of the PPSRI contributed to significantly more funding for pandemic related research in 2006/07 and 2007/08.





## 1.2.2 Program logic model and expected outputs and outcomes

A program logic model for the PPSRI was developed by III and reviewed by the Task Group in June 2006<sup>13</sup>. Based on review of available documentation as well as evaluation findings, a revised version is included in Figure 2. The logic model summarizes the inputs, activities, outputs, and expected short, medium and long-term outcomes of the PPSRI and the logical result linkages among them. The outputs and short-term outcomes – the focus of this midterm evaluation – are described in more detail below:

**Effective organizational model for supporting pandemic preparedness research:** this organizational model includes the mechanisms for: 1) identifying research priorities, based on knowledge gaps and the strengths and weaknesses of Canada’s research capacity in pandemic-related research, as well as partners’ interests; 2) translating the priorities into funding opportunities that capitalize on existing programs and structures and that introduce timely and attractive funding opportunities to the research community; and 3) coordinating interactions and exchanges at multiple levels, among researchers, partners, and research users.

**Organizational and institutional linkages identified and created:** these include linkages among national, provincial and private research funding partners, as well as international research efforts in pandemic preparedness.

This organizational model, including its linkages, is expected to produce two main outputs, as the platform for achievement of expected results:

**A coordinated research agenda,** that: addresses prioritized knowledge gaps; reduces duplication among funding initiatives available to Canadian pandemic researchers; and combines and leverages resources from multiple sources effectively.

**Funded research,** issuing from researchers’ response to a coordinated, timely suite of funding opportunities that is : targeted to strategic, priority issues; designed and launched in a manner that reaches and attracts applications from the relevant research community; and reflects the application of principles of highest scientific merit in its competitive, peer-reviewed adjudication.

In the medium term, the PPSRI is expected to produce the following results:

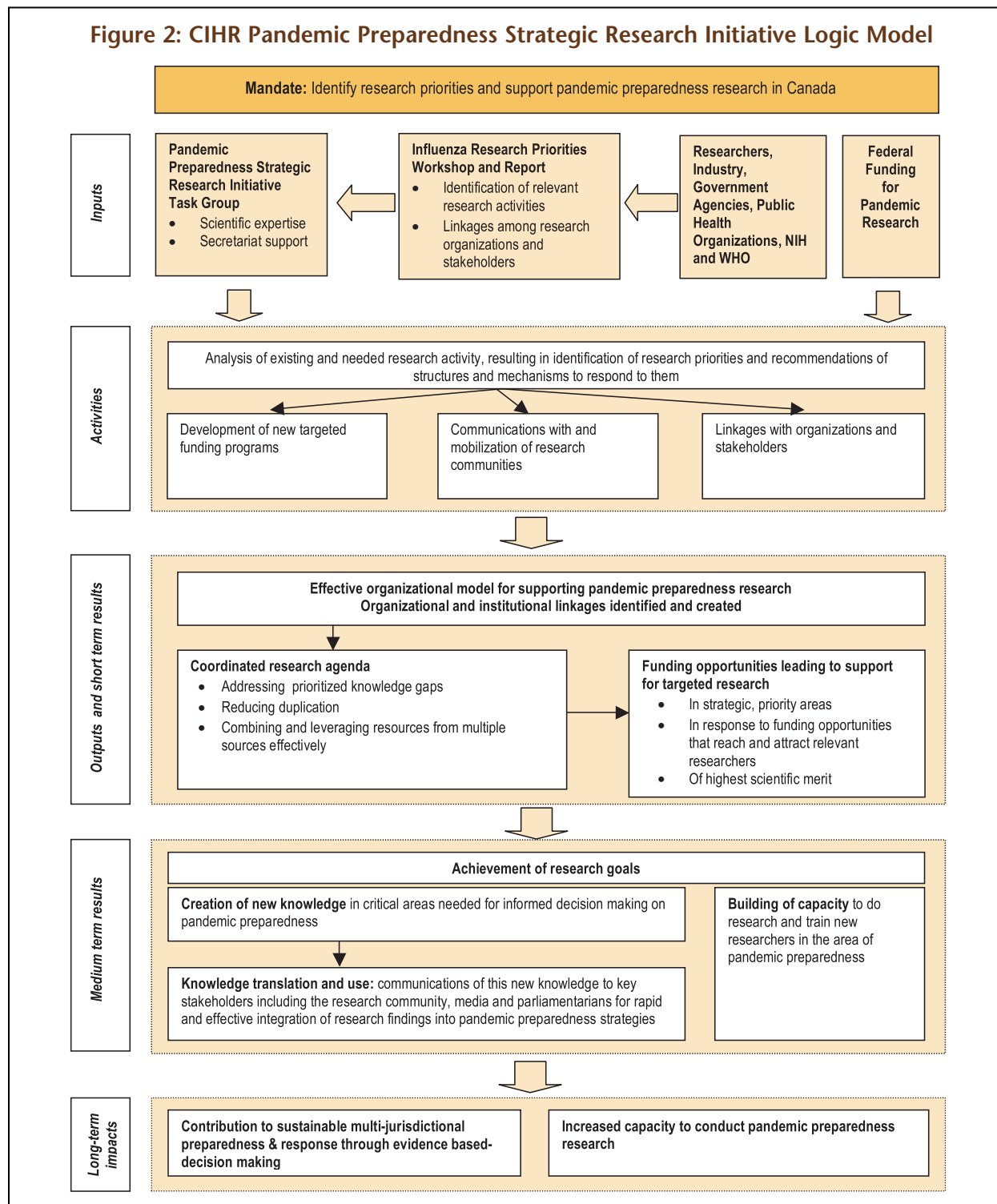
**Achievement of research goals:** at the level of funded projects, networks and the overall program; including three types of goals:

- **Creation of new knowledge:** in critical areas needed for informed decision making on pandemic preparedness;
- **Knowledge translation and use:** communications of this new knowledge to key stakeholders including the research community, media, key stakeholders and parliamentarians for rapid and effective integration of research findings into pandemic preparedness strategies;

<sup>13</sup> CIHR Pandemic Preparedness Research Initiative Logic Model, Draft, June 2006.

- Building of capacity: to do research, and to train new researchers and re-orient established researchers in the area of pandemic preparedness.

These medium term outcomes are expected to contribute to the long-term outcomes of sustainable multi-jurisdictional preparedness and response through evidence based-decision making and increased capacity to conduct pandemic preparedness research.



## 2. EVALUATION STRATEGY AND INFORMATION SOURCES

### 2.1 Evaluation issues and questions

Table 3 lists the evaluation issues and questions addressed in this evaluation. These were validated by the PPSRI Midterm Evaluation Steering Committee. As this was a midterm evaluation, all questions had a formative intent, aiming to identify possible improvements and alternatives.

**Table 3: Evaluation issues and questions**

Issue	Questions
<b>1. Effectiveness of priority setting</b>	
	1.1 To what extent were the PPSRI research priority setting processes appropriate, in terms of timeliness, mechanisms, and inclusivity of: a) research areas and b) groups of researchers? 1.2 How successful were the research priority setting processes – to what extent did they arrive at the most appropriate set of priorities for Canadian research in pandemic preparedness? 1.3 To what extent was national and international duplication of effort avoided, and complementarity enabled? 1.4 How necessary, appropriate (in terms of role and composition) and effective was the Task Group?
<b>2. Effectiveness of partnership development</b>	
	2.1 To what extent has the PPSRI been successful in building national and international partnerships? Which partnerships have been most and least successful? Are there partnerships that should be developed but have not been? 2.2 What have been the impacts of partnerships on: a) coordination and integration of national and international research programming; b) resource leveraging; c) research duplication and complementarity? 2.3 To what extent have the partnership structure and reporting strategy been effective in supporting the ongoing initiatives of partners, including the PPSRI?
<b>3. Appropriateness of program design</b>	
	3.1 To what extent is the suite of activities and funding programs offered through the PPSRI allowing the achievement of program objectives? Which components are most and least successful? 3.2 Is the overall strategy of strategic competition effective in ensuring that the most promising research is funded? Would an alternative strategy including the enabling “front-runners” (recognized leaders in the relevant fields) to continue to pursue relevant PP research) be more effective? Was this the most effective strategy for short and long-term capacity-building? 3.3 How effective was the communication strategy used to launch the funding opportunities?
<b>4. Achievement of desired funding opportunity outputs</b>	
	4.1 To what extent have the funding programs generated expected and/or desirable uptake from the relevant research communities? 4.2 To what extent do the sets of funded projects cover the intended field of program objectives? Which objectives streams are more and less well represented across funded projects? 4.3 To what extent will the funded projects result in building research capacity in areas related to pandemic preparedness (e.g., training of students, redirection of research foci, new investigators on teams)?
<b>5. Success of PPSRI networking and KT activities</b>	
	5.1 To what extent has the PPSRI been successful in facilitating communication and networking among researchers involved in pandemic preparedness research? Have all relevant teams and individuals been provided with networking opportunities, and what has been the uptake? 5.2 To what extent are communication and networking producing the expected results in terms of enhanced collaboration and increased capacity? 5.3 To what extent has the groundwork been put in place for effective knowledge translation to occur (e.g., inclusion of end-users, KT plans)?



## 2.2 Information sources

The following data sources were used to address the evaluation questions. Appendix 2 provides a matrix summarizing the indicators and data sources for each evaluation question.

**Review of documentation relevant to program design and delivery:** Documents relevant to program design and delivery were reviewed systematically, searching for information relevant to the evaluation questions and the program logic model. The documentation reviewed included:

- background material on the AI/PI and the PPSRI including the reports on planning and consultation leading up to program design;
- minutes and decision records of meetings of the Task Group;
- notes from peer review sessions, where these were available.

Appendix 3 contains a list of documents reviewed.

**Review of administrative data on program outputs:** III provided administrative databases containing data on applicants, applications and results of all PPSRI funding opportunities to date. These data, in Excel format, were transferred to SPSS and indicators relevant to program uptake and funding opportunities results extracted.

**Key informant interviews:** A main source of evaluation information was key informant interviews with 22 PPSRI stakeholders. These key informants, identified by the consultants with the help of III and input from the Evaluation Steering Committee, included key partners and participants in program design, implementation and funding, as well as researchers and peer reviewers. Although no stakeholder declined to participate, four of those approached did not reply to the invitation or could not be reached. Table 4 summarizes the number of interviewees by category.

**Table 4: Interviews conducted**

Type	Number
III / CIHR staff	3
Task Group members	4
Partner and stakeholder organizations	11
Researchers and peer reviewers	4
<b>Total</b>	<b>22</b>

Seven interviews were conducted in-person at the *Canadian Pandemic Preparedness Meeting: From Discovery to Frontlines*, held November 6-8, 2008 in Winnipeg, and the remainder were conducted by telephone between December 2008 and March 2009. The interviews ranged from 20 to 90 minutes in length, and were conducted in English or French, using a semi-structured interview guide (Appendix 4), addressing all evaluation issues and questions identified above. The majority of the interviews were recorded. Analysis was based on interview notes, with reference to the recordings for accuracy.



**Survey of researchers: non-applicants and successful and unsuccessful applicants.** The evaluation data sources also included a brief web survey of the research community for the PPSRI. This included: nominated principal investigators (NPIs), principal investigators and co-applicants who applied to any of the PPSRI initiatives, whether successfully or unsuccessfully. For principal investigators and co-applicants, only those who would have been eligible for CIHR funding as an NPI were included, i.e., trainees and others working in non-eligible organizations were excluded. Also surveyed were researchers who did not apply to the PPSRI although their work is relevant to pandemic preparedness. This group included NPIs who received grants in the last eight years from any other CIHR grant program whose application keywords, project title, title of funding opportunity and abstract review indicated that pandemic influenza and/or influenza might have been relevant to their research work<sup>14</sup>. III provided lists of distinct researchers in Excel format to the consultants, including the following fields: role (NPI, co-investigator or co-applicant), funding reference number, last name, first name, preferred language, current primary institution, and primary e-mail address. The consultants merged these lists to create a final list of distinct researchers.

The survey collected information on a subset of the evaluation questions (see Appendix 4). It was adapted for each of the four subsamples: researchers responded to the version of the survey that represented their closest association with the program<sup>15</sup>. The survey was pretested in English and French with two III pandemic researchers prior to its launch, and one minor adjustment made.

The survey invitation was emailed from the consultants to respondents with a header flagging it as being sent on behalf of III. Each survey invitation contained a unique URL. It was available in English and French and took about 15 minutes to complete. Two reminders were sent, at one-week intervals. The survey was open for data collection for a total of three weeks in February 2009.

From a total population of 486 researchers, 157 responses were received. Seventeen email addresses were no longer valid, four invitees were not available and two stated they were not aware enough to respond, resulting in an overall response rate of 34%. The table below shows the numbers of researchers who were invited and who responded in each of the categories. As might be expected, response rates were highest among funded applicants, especially NPIs.

**Table 5: Survey invitations and responses, by researcher category**

Researcher category	No. in population	No. of responses (%)
Funded applicants: Nominated principal investigators	35	21 (60%)
Funded applicants; co-investigators and co-applicants	162	65 (40%)
Unsuccessful applicants	231	59 (26%)
Non-applicants	58	12 (21%)
<b>Total</b>	<b>486</b>	<b>157 (34%)</b>

<sup>14</sup> As a test of the extent to which these CIHR applicants completely cover the intended population of researchers who could make a research contribution to pandemic preparedness within the priority research domains, the obtained list was compared to the list available of British Columbia and Quebec researchers in the Interprovincial Directory of Researchers database (<http://www.researchersdirectory.ca/ipd/>), identified using the keywords 'influenza' and "pandemic". Of the 20 researchers thus identified in the Directory, two were not among those in the CIHR or PPSRI applicants. This suggests that our list reasonably, but not totally, captured the relevant population.

<sup>15</sup> If the respondents had submitted successful applications as an NPI and as a co-investigator or co-applicant, they were provided with the NPI version; if they had submitted both a successful and an unsuccessful application, they were provided with the version for successful applicants.



Table 6 shows survey respondents' characteristics. These data suggest that the sample can be considered representative of the disciplines and settings of researchers involved in influenza-related research, insofar as there are no striking absences of respondents in the expected categories.

**Table 6: Survey respondent characteristics (n = 157)**

Characteristic	Funded applicants, including NPIs	Unsuccessful applicants	Non-applicants
<b>Disciplines of main research experience</b> ( <i>multiple responses allowed</i> )			
Biomedical sciences	40 (47%)	18 (31%)	7 (58%)
Clinical health sciences	23 (27%)	17 (29%)	3 (25%)
Health systems and services	25 (29%)	12 (20%)	*
Population and public health	32 (37%)	26 (44%)	5 (42%)
<b>Type of institution or organization</b> ( <i>multiple responses allowed</i> )			
University	65 (76%)	47 (80%)	10 (83%)
College	*	*	*
University-affiliated hospital	35 (41%)	19 (32%)	5 (42%)
Community-based hospital	*	*	*
Community-based/volunteer agency or organization	*	*	*
Government-funded agency or research agency	12 (14%)	17 (29%)	*
Private research organization	*	*	*
Other (unclear whether private or public)	*	*	*
*Ns less than 5 are not shown.			

In terms of distribution across the PPSRI priority research areas, a majority of applicants stated that their work is relevant to prevention and treatment (61%) and vaccines and immunization (52%) (62 respondents checked both these categories). Ethical, legal or social aspects were relevant to 39% of respondents and virus biology and diagnostics were relevant to 35%.

## 2.3 Analyses

The evaluation data were analyzed using standard quantitative and qualitative techniques. Survey data were received and stored on a secure server and transferred to SPSS. Descriptive analyses were conducted with the latter, comparing non-applicants and successful and unsuccessful applicants as well as research domains. Qualitative data from key informant interviews, integrating material from document review, were analyzed using matrix techniques: respondent types were crossed with evaluation questions, and interview material entered into summary matrices and emergent patterns synthesized from the patterns across and within rows and columns.

Note that of the 157 survey respondents, 135 (86%) had heard of the PPSRI. The questionnaire was constructed so that only those who had heard of the PPSRI were asked questions about its features. Those who had not heard of it – a group that included some researchers who applied to it – were asked only questions about strategic research funding more generally, and provided background information. Thus, most of the survey data are from respondents who were aware of



the PPSRI. In addition, in presentation of the survey results 'don't know' responses are excluded from the denominator, so that percentages reflect only responses from individuals knowledgeable enough to respond to the particular question. In most cases, 'don't know' responses frequencies were less than 5% of the total and so would not affect interpretation. However, for a few of the questions, the proportion of 'don't know' responses was quite high: these are mentioned in the corresponding text.





## 3. FINDINGS

### 3.1 Effectiveness of priority setting

#### Effectiveness of PPSRI research priority setting processes

##### *Overview of the steps in priority setting*

**Priority setting workshop.** The process of priority setting for the PPSRI began with an Influenza Research Priorities Workshop, held by CIHR in collaboration with the Public Health Agency of Canada (PHAC) and the Canadian Association for Immunization Research and Evaluation (CAIRE) in September 2005. The workshop was attended by 66 individuals from Canada, the United States and Europe, representing researchers, public health systems and organizations at every level, and the private sector. It produced a series of 10 priority areas, with a rationale and an analysis of the infrastructure required for each. The themes areas were:

- Influenza virus characterization and ecology
- Influenza virus transmission
- Public health preventive measures
- Improving rapid diagnostic tests
- Clinical management of influenza patients
- Development and optimal use of antiviral drugs
- Surge capacity of the health care system
- More effective and acceptable influenza vaccines
- Immunization programs
- Preparation for a pandemic vaccine

The key subsequent step identified in the workshop was for CIHR and PHAC, in 2006, to “develop strategic approaches for funding mechanisms and opportunities and national/international liaison for identified research priorities”.

The evaluation results for the workshop were quite positive, with for example, 34 out of 44 questionnaire respondents agreeing that the overall objectives of the workshop had been achieved and distinct next steps were identified. A need to further synthesize and prioritize within the list of ten priority areas was mentioned in the evaluation report, based on comments that the workshop-generated list was too exhaustive for the level of funding available.<sup>16</sup>

**Task Group.** The Task Group was constituted in June 2006 and met eight times between June 16 and August 31. It was initially composed of four members, including a member of III’s IAB, two other researchers, and a representative from PHAC. The Task Group identified a need for additional expertise in social science, health services research and ethics, resulting in the addition of another

<sup>16</sup> Proceedings of the Influenza Research Priorities Workshop, August 31 - September 1, 2005. <http://www.cihr.ca/e/30967.html>





researcher. III's Scientific Director was an ex-officio member, and five CIHR and PHAC staff members also participated in meetings.

Following on the Influenza Research Priority Workshop, the Task Group's main task was to develop a strategic set of research priorities for the PPSRI. This was accomplished over several meetings. An initial large list with eight categories<sup>17</sup> was refined based on members' comments and on consultations with key agencies, including the Rx&D Health Research Foundation; Canadian Food Inspection Agency; the International Development Research Centre – Asia Research Partnership on Pandemic Influenza.<sup>18</sup> The Task Group then sent a draft of the Pandemic Preparedness Strategic Research Priorities for consultation to the Canadian Rapid Research Response Team (C3RT)<sup>19</sup> and C3RT ad hoc members on pandemic preparedness, a total of 21 individuals representing 12 organizations. Sixteen responses to the consultation request were received, with a majority of respondents agreeing that each of the draft areas identified by the Task Group was a priority for Canadian research.<sup>20</sup> This resulted in the priority areas listed in section 1.2.1., some of which regrouped two or more of the categories identified in the workshop, and which included an explicit focus on capacity building.

### ***Stakeholders' view of the priority setting process***

Key informants interviewed for this evaluation were generally of the opinion that the priority setting process had been effective. The inclusivity of the process, in particular that of the 2005 priority setting workshop, was cited very positively as having allowed input from not only the core groups of researchers and stakeholders who had been historically associated with influenza research in Canada, but other researchers and stakeholders "*outside the regular group*". The only exception to inclusivity mentioned by key informants were a possible lack of adequate representation from health services and population health research, and a focus on human, as opposed to animal health or human-animal interaction. The timing of this workshop was also mentioned positively, as it coincided with reflection and mobilization being undertaken by partner organizations, notably PHAC and the Canadian Food Inspection Agency (CFIA). At the same time, a drawback to the inclusivity was also noted, in that the resulting priorities were very broad, "*more like categories than priorities*"; "*all we really did was identify all the unanswered research questions for influenza*". While ensuring that most of the potential research community could see themselves within these priority areas, some respondents argued that they were not sufficiently narrow to accomplish strategic targeting of investments. This was echoed in one peer review committee's comments.<sup>21</sup>

<sup>17</sup> Influenza virus characterization and ecology; transmission and public health preventive measures; behavioural theme; diagnostics; antiviral; surge capacity; vaccines; immunization programs. Task group meeting minutes, July 6 2006.

<sup>18</sup> Task Group meeting minutes, July 6, July 13, July 20. 2006.

<sup>19</sup> This group was formed after the Canadian Severe Acute Respiratory Syndrome (SARS) Research Initiative, to allow for more rapid research response to health threats. It is composed of representatives from CIHR, the Institute of Health Services and Policy Research (IHSPR), the Institute of Population and Public Health (IPPH); Institute of Infection and Immunity (III) and senior representatives of Rx&D Health Research Foundation; PHAC, the Council of Chief Medical Officers of Health (CCMOH), the Canadian Food Inspection Agency (CFIA), National Institute of Allergy and Infectious Disease (NIAID) of the National Institutes of Health (NIH); Michael Smith Foundation for Health Research, and Health Canada. Ad hoc members include senior representatives of: the Canadian International Development Agency (CIDA); the International Development Research Centre (IDRC); the Public Health Agency of Canada (PHAC); NIAID; Mathematics of Information Technology and Complex Systems (MITACS); Canadian Association for Immunization Research and Evaluation (CAIRE); CIHR's Knowledge Translation and Ethics Branches, and the Institute of Aboriginal People's Health.

<sup>20</sup> Report on the Pandemic Preparedness Research Initiative, Institute of Infection and Immunity, CIHR, <http://www.cihr.ca/e/32573.html#2>

<sup>21</sup> Pandemic Peer Review Committee Meeting, December 16, 2008: End of Meeting Discussion Summary.



Findings from the interviews as well as from the document review<sup>22</sup> suggest that the overall strategy adopted for the PPSRI for setting priorities tended toward risk aversion, seeking to support work that would produce high-impact results in the short term. The broadness of the priorities was also seen as a conservative strategy, in that by placing fewer limits on the fundable fields, the possibilities of achieving breakthroughs in knowledge could be maximized. This seems to have been responding to both the potential urgency of preparing for a pandemic as well as the time constraints on funding.

### ***Appropriateness and effectiveness of the Task Group***

Key informants who had been involved with or members of the Task Group noted that it had been formed based on recommendations from III's IAB, recognizing the need to involve all four CIHR pillars, including clinical and social science research. They agreed that its composition was appropriate.

One key informant noted that there had been quite a long interval between the priority setting workshop and the launch of funding opportunities, suggesting that this had somewhat disappointed the high expectations at the end of the workshop. It was noted by others, however, that the workshop had been held before funding was confirmed, and due to the time required to obtain Treasury Board approval, the process had moved as quickly as could have been expected.

Key informants familiar with the Task Group's processes were of the view that the group had functioned effectively, contributing an intense effort over the summer of 2006. Task Group members observed that although they were specialists in different areas, they took their role seriously and pulled together so as to produce a priority statement that reflected collective interest for pandemic research and not just their own. For some, an overarching driver was not repeating problems that had been experienced during the Canadian SARS outbreak and research response.<sup>23</sup> Stakeholders external to the process praised its results and particularly the efforts of III staff in terms of developing connections with partner agencies that led to the production of a coordinated research agenda.

### ***Conflict of interest in priority setting***

Although not a majority view, a concern raised in the key informant interviews was of possible perceived or actual conflict of interest in the priority setting process, in that some people who had had significant input into the priorities would also be likely to receive funding under these priorities. For example, one Task Group member commented that it was unusual from his/her organization's perspective for researchers who would likely be receiving funding to be involved in directing priorities. This was also of concern to III: because of the small size of the Canadian research community in this area, researchers who would be eligible for funding also participated in the priority setting workshop, the Task Group and the peer review committees (in the latter two

<sup>22</sup> Task Group meeting minutes, June 16 2006.

<sup>23</sup> The evaluation of the Canadian SARS Research Consortium describes lessons learned: <http://www.cihr-irsc.gc.ca/e/28351.html>



cases, following the usual CIHR conflict of interest guidelines).<sup>24</sup> Thus, one of the elements assessed in the researcher survey was respondents' perceptions of the conflict of interest in the design of the initiative and the adjudication of the applications.

The survey results showed that 23% of respondents stated that they did not know whether there was conflict of interest in the way the PPSRI was designed, and 40% did not know whether there was conflict of interest in the way it was adjudicated. This is not surprising, as most researchers would not have been directly involved in either of these processes. Among those who were able to answer, just under 15% agreed that there had been conflict of interest in the program design or adjudication processes (Table 7). As might be expected, unfunded researchers' views were more negative than funded researchers' (data not shown because of small Ns). Although it is easy to dismiss unfunded researchers' views as reflective of their disappointment in the funding decisions, given the relative size of the unfunded group, any level of perceived conflict of interest is perhaps of concern. However, overall, close to 85% of the PPSRI research community does not perceive there to have been conflict of interest.

**Table 7: Researchers' views of conflict of interest (n = 127 applicants)**

	No. (%) agree or strongly agree
I felt there was conflict of interest in the way the PPSRI was designed.	12 (13.5%)
I felt there was conflict of interest in the way the PPSRI applications were reviewed.	11 (14.5%)

### Relevance and adequacy of the priorities chosen

Key informants noted that the set of priorities retained for the PPSRI adequately and "respectfully" reflected the priority setting process, and that all the priorities included were important. Several respondents again commented on the broadness of the priority areas, noting that possible consequences may have been first, to spread funding too thinly, and second, to lessen its potential impact by failing to focus on specific and highly targeted research questions. At the same time, respondents noted some gaps in the priorities. It was also pointed out that the coverage of the priority areas in the actual distribution of grants was not even, so that some areas received more funding than others. According to key informants, this may have been a reflection of existing capacity: within the five-year timeframe, it was not possible to stimulate research in areas where applications were not received, and so proportionately more grants were awarded in areas where applications were received and passed peer review. As well, as suggested in key informant interviews, the peer review process in funding opportunities that involved multiple disciplines may have contributed to uneven allocations. Ethics was an area mentioned by some key informants as having received a perhaps inordinate amount of research attention, although others applauded its inclusion and stressed its importance.

<sup>24</sup> Three of the five Task Group members applied for funding under the PPSRI and two were successful NPIs. Of the 79 distinct members of the PPSRI's Peer Review Committees, nine were successful applicants and five were unsuccessful applicants.



In the researcher survey, 13 funded researchers (16%), 18 unsuccessful applicants (40%), and two non-applicants (total 33, 24% of the total) agreed that important research priorities had not been included in PPSRI. These priorities included research on (listed in order of frequency of mention):

- immune systems and immunization;
- specific methodologies, including modeling;
- international issues in pandemics or involving international collaborations;
- surveillance systems and applied epidemiology;
- animal-human transmission;
- epidemic management; and
- behavioural, social or ethical dimensions of pandemic.

These areas are similar to the gaps mentioned by key informants, which included: animal/human interaction and animal issues; surveillance research, clinical research on prevention and treatment; and legal issues.

Among the priority gaps identified by both researchers and by key informants are themes that had been part of the initial Task Group discussions<sup>25</sup> but which were not directly emphasized in the final PPSRI priorities: research on epidemic management, animal-human transmission, and modeling. The latter two were also mentioned in key informant interviews as having been considered by the Task Group and excluded from the funded research.

Researchers were also asked which priorities are the most important for pandemic preparedness research over the next five years. They were asked to rate the importance of the existing PPSRI priorities, as well as suggest other priority areas and rate their additions to the list. The data shown in Table 8 confirm relatively strong support for the existing priorities, with “Prevention and treatment” receiving the strongest endorsement. One half (50%) of these respondents (of whom 39% declared themselves to be engaged in these research areas) endorsed “Ethical, legal or social aspects” of pandemic preparedness as being of high priority.

**Table 8: Researchers’ rating of pandemic research priority areas in the next five years (n = 157)**

Priority area	No. (%) indicating high or very high priority
Prevention and treatment	128 (83%)
Vaccines and immunization	125 (81%)
Virus biology and diagnostics	106 (71%)
Ethical, legal or social aspects	76 (50%)
Other areas related to pandemic preparedness and influenza research (see Appendix 5)	74% (average over 4 possible responses)

A number of other priority areas (some of which could be considered subareas of the existing ones) were also identified by 60 (38%) of respondents. These were regrouped into several categories. The most prevalent category was research related to aspects of influenza and pandemic management from a public health perspective; i.e., the areas identified in the priority setting workshop as “public

<sup>25</sup> Task Group minutes, July 6 2006.



health preventive measures” (defined as non-pharmaceutical, interventions to reduce exposure to influenza and avoid infection) and “surge capacity” (defined as capacity of the health care system to respond to unprecedented demand in a pandemic).<sup>26</sup> This area may also include research on real-time surveillance and surveillance capacity, also mentioned by several survey respondents, and identified in key informant interviews as a gap. Research priorities relating to use of specific methodologies were also frequently mentioned, as were research on behavioural, social or ethical dimensions of pandemic. Basic immune system research was identified as a priority by several respondents (“Effects of treatment on immune responses to infection” was included as an element of the priority on development of effective antivirals in the priority setting workshop<sup>27</sup>, but not mentioned in the funding opportunity).<sup>28</sup> Global/international issues and environmental issues were also seen as emerging priority areas. Appendix 5 provides the complete list of priorities for the next five years identified through the researcher survey.

### **National and international duplication of effort versus complementarity**

Stakeholders who commented on this issue agreed that the PPSRI has generally succeeded avoiding duplication of effort in funding of pandemic research: there appeared to be no outright duplication and little direct overlap among the research priorities themselves, and good coordination of funding efforts with some national agencies due to partnerships established (discussed further below). Through the international collaborative research it funded, the PPSRI allowed researchers to work in complementary areas. However, the PPSRI did not contribute directly to international complementarity of research funding. Key informant interviewees reported that there had been significant challenges in trying to share research agendas across countries: *“we tried on a couple of fronts (vaccine development and antiviral) to share information, leverage and coordinate internationally with some countries, but it was impossible to coordinate and keep track of things like trials and the hundreds of pieces of research going on.”* The PPSRI did benefit from contacts with American research agencies in the same area, becoming familiar with their research agendas and having this inform the Canadian initiative.

## **3.2 Effectiveness of partnership development**

### **Success in building national and international partnerships**

Through the consultation process with stakeholders led by the Task Group, nine organizations indicated interest in partnering in one or more of the research areas<sup>29</sup>. These were:

- American Red Cross
- Canadian Food Inspection Agency (CFIA)
- Association of Medical Microbiology and Infectious Disease Canada / Canadian Foundation for Infectious Diseases
- Canadian International Development Agency (CIDA)

<sup>26</sup> <http://www.cihr.ca/e/30967.html#summation>

<sup>27</sup> <http://www.cihr.ca/e/30967.html#summation>

<sup>28</sup> <https://www.researchnet-recherchenet.ca/mr16/LoginServlet>

<sup>29</sup> Pandemic Preparedness Strategic Research Initiative - Report on Activities & Outcomes  
<http://www.cihr.ca/e/32573.html>



- Emerging Infectious Disease Research Network
- First Nations and Inuit Health Branch, Health Canada (FNIHB)
- Rx&D (an association of Canada's research-based pharmaceutical companies) Health Research Foundation (HRF)
- International Development Research Centre (IDRC)
- Public Health Agency of Canada (PHAC).

Some organizations were interested in partnering to carry out research while other organizations were interested in partnering to support research. Formal partnerships involving joint funding opportunities were developed with PHAC, CFIA, HRF and IDRC. These organizations were most ready to develop partnerships, as they had either worked with CIHR on the priority setting workshop in 2005 or had already developed their own pandemic research agendas or priorities. Within CIHR, several institutes and portfolios also partnered in the PPSRI, participating in joint funding opportunities: CIHR Institute of Aboriginal Peoples' Health (IAPH); CIHR Institute of Health Services and Policy Research (IHSPR); CIHR Institute of Population and Public Health (IPPH), CIHR Knowledge Translation Branch; the Ethics Office of CIHR, and CIHR Partnerships and International Relations Branch. A research funding partnership was formalized with the Mathematics of Information Technology and Complex Systems (MITACS: a Network of Centres of Excellence (NCE) for mathematical sciences) for the 2006 Operating Grant funding opportunity, but no joint funding occurred with this organization.

## Impacts of partnerships

### *Coordination and integration of national research programming*

The PPSRI's partnerships with PHAC, CFIA and HRF resulted in joint funding of research activities. Stakeholders interviewed from these external partner organizations viewed these partnerships as very successful, noting several advantages gained from their perspectives. These included ensuring the partner's research funds would support research with clear, carefully developed priorities; and bringing partners together in a coordinated initiative that avoided duplication of effort. Capitalizing on CIHR's peer review system was also seen as an important benefit of the partnerships, as it ensured that the research would undergo rigorous review, without the partners having to develop the necessary infrastructure and expertise. These findings suggest that the PPSRI was effective in producing coordination and integration of national research programming, as well as avoiding duplication.

Although IDRC partnered on a funding opportunity for joint research on pandemic preparedness by Canadians and researchers from developing countries, the uptake on the funding opportunity was such that no awards were made. Although it praised the PPSRI's intentions and efforts to find common ground, IDRC felt that it had not been involved early enough in the funding opportunity development process to ensure that it could be oriented towards its research agenda and the specific needs of capacity development in developing countries. From its point of view, the resulting applications were too biomedical in orientation to garner IDRC support, and did not fulfill IDRC's





aim of partnering foreign researchers in lower-capacity settings with Canadian researchers who had experience in developing countries as equal partners. According to key informants, this would have required consultation with developing countries' research and policy communities, as well as a capacity/building proposal development process to forge relationships among researchers who had not worked together before. The time constraints of the PPSRI, along with a complicated process to develop a Memorandum of Understanding between CIHR and IDRC, rendered these steps impossible. From III's point of view, the partnership presented challenges in terms of the difference in mandates of the two organizations: while they shared an interest in pandemic preparedness research, CIHR's mandate focuses on research excellence regardless of setting, while IDRC's focuses on strengthening research capacity in developing countries. Finding and operationalizing the two agency's common ground may have required a longer period than was available within the time pressures to launch PPSRI funding opportunities.

The partnership with PHAC was regarded by key informants as having been very successful, and a significant advance over the research experiences encountered with SARS. PHAC representatives reported having benefitted from the close collaboration with CIHR on the PPSRI, through organizational learning about research processes. PHAC's involvement with the Task Group, the priority setting processes and the structuring of funding opportunities were key components for ensuring coordination and integration of their joint research programming. At the same time, some key informants outside of PHAC expressed concern about the extent to which PHAC's research agenda had been adequately addressed through the PPSRI, because of the strong investigator-driven orientation of influenza research in Canada, and because of the small size of the influenza research community. Sharing this concern, PHAC reserved some of its research funds for directed research under contract. The Influenza Research Network funding opportunity was also seen by some key informants as providing a necessary focus on research efforts to ensure that those efforts will contribute directly to "on-the-ground" pandemic preparedness, i.e., PHAC's preparedness mandate.

### Partnership structure

There was consensus among key informants from external agencies – including IDRC and PHAC – that the PPSRI had developed an effective partnership structure. Its success was attributed largely to III's approach to developing the partnerships: stakeholders praised its success in bringing organizations together who had not partnered on research before– an *"incredible accomplishment"*. Partners were especially appreciative of III's approach in listening and responding to partners' needs, and its willingness to adjust its processes and projects to accommodate partners' interests: *"their willingness to include other objectives that were important for us as partners – we clearly felt that they wanted to collaborate with us... a true partnership rather than just using us as a bank"*. Cited here, as examples of III's effectiveness in partnership, were the relevance reviews for several PPSRI funding opportunities that involved partners, and processes whereby partners could ask for clarifications from applicants. III representatives acknowledged that adjustments to their processes had been made so as to ensure that partners could and would remain involved. *The Canadian Pandemic Preparedness Meeting: From Discovery to Frontlines* meeting held in November 2008, a component of

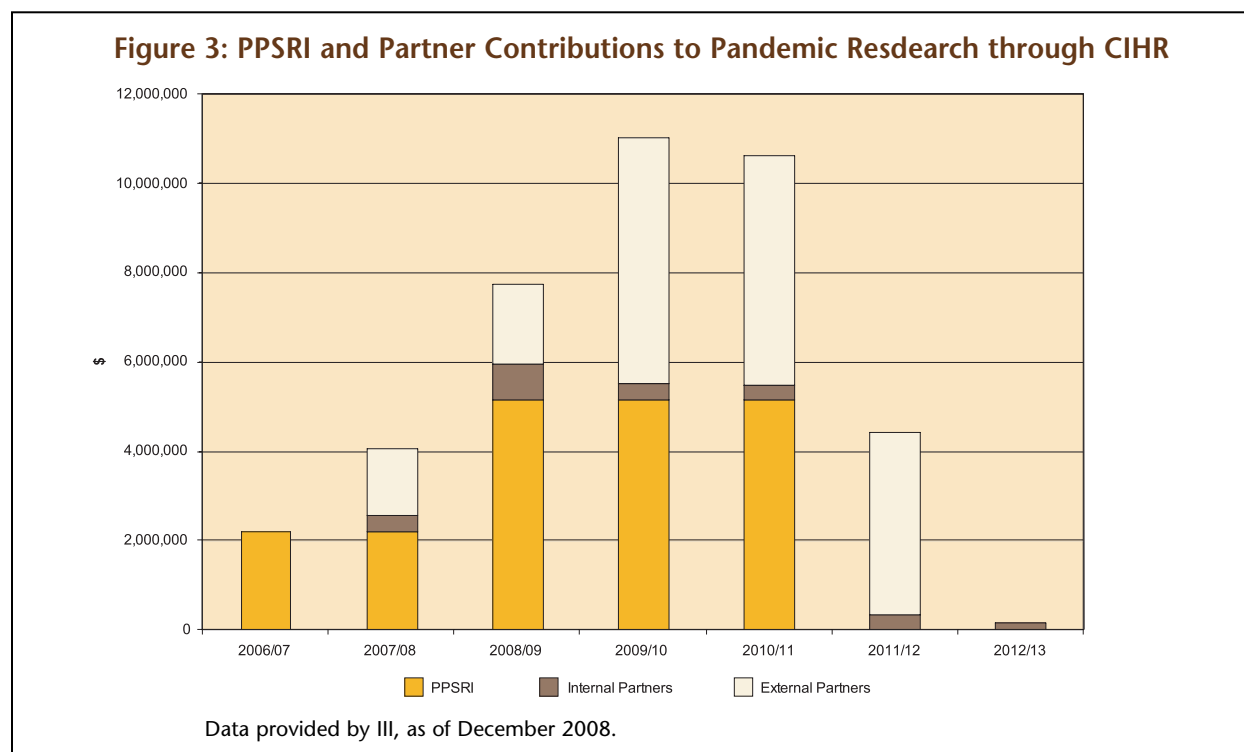


the PPSRI's Knowledge Translation Strategy (see section 3.5) was also cited as an exemplar of partnership process to develop coordination and integration of research programming, although mainly at the national level.

Indeed, above and beyond the experience with IDRC, international partnership structures were seen by key informants as not having developed as far as would have been desired. Although some discussions with international agencies were described positively, key informants reported that there had been no real response from the WHO despite it having been approached, and that significant barriers existed to using the existing channel of CIHR's China-Canada initiative. It was noted that because the contexts of each country's research are so different, tending to focus on their own internal issues, developing collaboration takes time, and likely more time than available to a five-year initiative such as the PPSRI.

### Resource leveraging

As can be seen from the figure below, partners' direct contributions resulted in doubling the resources available for pandemic research. Partners' allocations account for 51% of all PPSRI funds over the period 2006/07 to 2012/13. External partners will contribute 45% of the total funds, while internal partners (other Institutes and units of CIHR) will contribute 6%. These contributions may be underestimated, as they do not include in-kind contributions and only includes those funds administered through CIHR. Thus, the PPSRI has resulted in significant resource leveraging for pandemic preparedness research.





As noted above, funding partners were keen to contribute research funds to the PPSRI, to achieve leveraging from their perspective especially in benefiting from CIHR and III's infrastructure and to ensure a coordinated research effort.

### **Reporting strategy**

The PPSRI's reporting strategy aimed to keep national and international partners transparently apprised of developments in the initiative. However, few key informants were aware of the reports or other elements of the strategy, and so could not comment on its effectiveness.

As of March 30, 2009, the III website has a link to the following PPSRI publications:

- Proceedings of the Influenza Research Priorities Workshop (September 2005): [http://www.cihr-irsc.gc.ca/e/documents/fin\\_rep\\_influenza\\_work\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/fin_rep_influenza_work_e.pdf);
- PPSRI Application Development Workshop Report (March 2007): [http://www.cihr-irsc.gc.ca/e/documents/iii\\_adw\\_report\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/iii_adw_report_e.pdf);
- Pandemic Preparedness Strategic Research Initiative: Report on Activities and Outcomes (June 2006 - June 2008): [http://www.cihr-irsc.gc.ca/e/documents/iii\\_ppsri\\_report\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/iii_ppsri_report_e.pdf);
- Report on the Influenza Research Network Application Development Workshop (February 2008) [http://www.cihr-irsc.gc.ca/e/documents/irn\\_app\\_dev\\_workshop\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/irn_app_dev_workshop_e.pdf).

## **3.3 Appropriateness of program design**

### **Success of the suite of funding opportunities**

Key informants were asked to what extent the set of funding opportunities offered through the PPSRI was contributing to achieving the initiative's objectives. There was consensus that the program components, through the funding opportunities, were addressing the priority areas identified in the priority setting process. It was noted, however, that the time required to develop and launch the opportunities had led to a compression of the time frame for the grants from five years to a maximum of three. According to key informants, this type of initiative would benefit from a two-year planning and implementation phase followed by five years of funding. It was also again noted that the level of funding available was not commensurate with the broadness of the priority areas.

In the researcher survey, PPSRI applicants who had heard of the PPSRI (86% of those completing the survey) were asked to indicate whether a set of factors had influenced their decision to apply or not apply to the program, as a measure of incentive and disincentive features of the suite of funding opportunities (Table 9). For those who did submit applications to one or more of the funding opportunities, their qualifications (94%) and the degree of fit of their research with the PPSRI themes (93%) were the most frequently selected incentive features, indicating that the program reached those with specific expertise in the targeted areas. The expected involvement of students (43%) and the relative prestige of the program (38%) were the least influential factors. Over and above the ubiquitous reason of already having enough research funding, among the 10



non-applicants who answered these questions, the view that the program seemed to be targeting specific groups of researchers was selected as a disincentive factor by eight. This is surprising, given that these non-applicants have a previous successful history of pandemic-related research applications with CIHR. However, six also indicated that a lack of fit with their research areas was a factor in their decision not to apply. Perhaps because of this, six also indicated that their chances of success would not have been good enough to be awarded funding.

**Table 9: Incentive and disincentive features for applications: Factors in applying or not applying**

	No. (%) agree or strongly agree	
	Applicants (n = 125) (factors in decision to submit)	Non-applicants (n= 10) (factors in decision to NOT submit)
Qualifications of me and my co-applicants	118 (94%)	*
Degree of fit of my research with the themes	116 (93%)	6
Type of grants offered (e.g., team grants)	92 (74%)	*
Applicants: Thought my/our chances of success were good Non-applicants: Thought my/our chances of success were not good enough	88 (70%)	6
Applicants: Timing of RFA was good Non- applicants: Timing of RFA was poor	84 (67%)	*
Applicants: Needed more research funding Non applicants: Already had enough research funding	69 (55%)	10
Size of the grants offered	67 (54%)	*
Duration of the grants offered	67 (54%)	*
Program seemed to be targeting specific groups of researchers	62 (50%)	8
Past experience with applications to CIHR	56 (45%)	*
Expected involvement of students in the project	54 (43%)	*
Relative prestige compared to other programs available	48 (38%)	*
Other reasons	20 (16%)	*
Was not aware that it existed	Not asked	*
*Ns of less than 5 are not shown.		

### Effectiveness of strategic competition

A question of interest to III in the context of the PPSRI but also more generally, was whether funding opportunities in an area of strategic importance and in need of rapid advances in knowledge should focus on funding recognized front-runners in the area, or allowing all researchers to compete for funds.

All researchers, including those who had not heard of the PPSRI, were asked to provide their view on this question: their responses are shown in Table 10. Across all categories of respondents, there is stronger support for ensuring that all researchers who can make a contribution have the opportunity to compete for funds, than for ensuring that recognized leaders can continue to receive funding. As the funded applicants' category is the most likely to include Canada's recognized leaders in pandemic preparedness research, this is an important difference to note. However, almost 80% of funded researchers also agree that continued funding to recognized leaders was important –



compared to 53% of unsuccessful applicants. A third strategy, of increasing research capacity overall by ensuring that researchers new to the field can access funding, elicited endorsement from 65% of unsuccessful applicants, and 48% of funded applicants.

**Table 10: Researchers' agreement with types of funding strategies**

	No. (%) agree or strongly agree		
	Funded applicants, including NPIs (n = 86)	Unsuccessful applicants (n = 59)	Non-applicants (n = 12)
<i>In designing strategic research initiatives such as the PPSRI, funding agencies may use different strategies to maximize the chances of significant advancement in knowledge. With respect to the PPSRI, to what extent do you agree with the following strategies?</i>			
Funding should ensure that recognized leaders in the targeted research areas can continue to pursue relevant research.	67 (78%)	32 (55%)	7 (58%)
Funding should ensure that all researchers who can possibly make a contribution have the opportunity to compete for funds.	73 (85%)	51 (86%)	11 (92%)
Funding should concentrate on increasing research capacity by targeting researchers and their trainees who are new to the field.	41 (48%)	37 (65%)	6 (50%)

### Effectiveness of the communication strategy

When asked about the PPSRI's communication strategy, those key informants in a position to comment noted that as is typical, those researchers who are most active and involved in the area were most aware of the initiative. III staff indicated that communications about the initiative had been made through lists compiled by III of about 3,500 infection and immunity researchers and stakeholders as well as a list of researchers who had been involved in pandemic and influenza related events such as the 2005 workshop. They noted that there was a possibility that they had reached mainly people already working in the area. It was also pointed out that as CIHR has so many funding opportunities, it is hard for the average researcher to keep track of them and know where they are coming from. Review of website information on the PPSRI tends to confirm this observation: there seems to be no one location or search that will identify all the PPSRI program components; those that are part of existing CIHR initiatives are especially hard to locate.

According to some key informants, the time pressure to launch the programs also affected communications. The need to produce, translate and disseminate program materials by dates that would allow adequate time for researchers to prepare proposals obviated possibilities for conducting more outreach activities or developing more extensive mailing lists. Lack of reach to the public health community was invoked as a possible explanation for the lack of response to the Transmission, Public Health Measures and Compliance Operating Grant funding opportunity (see next section).

Data from the researcher survey tend to corroborate the need for more effective communication. As indicated above, twenty-two (14%) of the respondents, including six (7%) of the funded researchers, indicated that they had never heard of the PPSRI or did not know if they had. Unsuccessful applicants were less likely than non-applicants to have heard of the program (76% versus 83%), raising a question about whether their lack of success was tied to a lack of awareness

of the parameters and evaluation criteria of the funding opportunity they applied to. Among those who had heard of the program, about one-half of the respondents (54%) funded through it agreed that the communications about the program had been adequate (10, or 13%, did not know). These results may signal not only a need for more communication about the program, but also a need to ensure that researchers' attention is drawn to the funding opportunities' specific features.

### 3.4 Achievement of desired funding opportunity outputs

#### Program uptake

The 29 funding opportunities offered under the auspices of the PPSRI prompted a total of 149 applications, of which 71 were funded (Table 11). These were submitted by a total of 102 different NPIs, of which 44 were involved in one or more successful applications as either an NPI or an applicant. The number of applications per NPI ranged from one to eight, and the number of successful applications from one to three.

The overall success rate was 51% for reviewed applications and 92% for fundable applications (those that were rated 3.5 or higher by the peer review committees<sup>30</sup>). This means that over all the funding opportunities, the majority of eligible and scientifically meritorious applications were funded. This rate is higher than that generally seen in CIHR funding opportunities. Given that the same quality standards were applied in the peer review process as in CIHR peer review overall (although see below for some contrasting views), this may suggest that the amount of funds available vis-à-vis the number of fundable applications was relatively high, i.e., that the funding opportunities generated a relatively low number of applications. Although this may be partly due to a lack of interest in or awareness of the PPSRI, it may also support the identified need to build pandemic research capacity.

<sup>30</sup> This rating, on a 5-point scale, is considered to be a "very good" level of scientific merit. Only proposals rated 3.5 or higher ("very good", "excellent", or "outstanding") are eligible for CIHR funding (see: The CIHR Peer Review Process: Policies and Responsibilities of Grants Committee Members; [http://www.cihr-irsc.gc.ca/e/documents/peer\\_review\\_policies\\_responsibilities\\_grants\\_cttee\\_members\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/peer_review_policies_responsibilities_grants_cttee_members_e.pdf)). However, depending on the number of applications reviewed in a given competition and the amount of funds available, some applications that are rated 3.5 and higher may not be funded, as grants are awarded to the highest scoring applicants. The number of unfunded but meritorious (3.5+) grants in a competition is viewed as an indicator of the degree of competitiveness or excellence of the field, i.e., the strength of its research capacity.



Table 11 : Program uptake and success rates

Application deadlines	Application deadlines	No. of applications received*	No. of applications withdrawn	No. of fundable applications	No. of funded applications	Success rate (%) based on:	
						Fundable applications	Reviewed applications
Aug 2006	Pandemic Preparedness Operating Grants Funding Opportunity	60	2	28	26	93	45
Aug 2006	CIHR / Regional Partnership Program/Operating Grant: Pandemic Preparedness	1	0	1	1 **	100	100
Oct 2006	International Opportunities Program - Collaborative Research Project	2	0	1	1	100	50
	CIHR International Opportunity	3	0	1	1	100	33
	Program – Development Planning Grant	6	0	6	6	100	100
Dec 2006	CIHR International Opportunity Program – Development Planning Grant						
Dec 2006	Team Grant: Influenza Transmission and Prevention Funding Opportunity	8	3	1	1	100	20
Dec 2006	Workshop/Symposia Support in collaboration with Knowledge Translation Branch	1	0	1	1	100	100
Mar 2007	Bridge Funding: Pandemic	3	0	3	3	100	100
Sept 2007	Preparedness Strategic Research	4	0	2	2	100	50
Sept 2008	Initiative	1	1	0	0	0	0
June 2007	Knowledge Synthesis Grant	0	0	0	0	0	-
Oct 2008		1	1	0	0	0	0
July 2007	Applied Public Health Chairs (relevant to PPSRI)	3	0	2	2	100	67
Feb 2008	Meetings, Planning and Dissemination	0	0	0	0	0	-
June 2008	Grant: End of Grant Knowledge	0	0	0	0	0	-
Oct 2008	Translation Supplement	0	0	0	0	0	-
Oct 2007	Meetings, Planning and Dissemination	0	0	0	0	0	-
Feb 2008	Grant: Infection and Immunity	0	0	0	0	0	-
June 2008		1	0	1	1	100	100
Mar 2008	Operating Grant: Priority Announcement – Pandemic Preparedness – Transmission, Public Health Measures and Compliance	2	0	0	0	0	0
Nov 2007	Operating Grant: Pandemic Preparedness Research - Influenza Diagnostics Transmission, Ethics Review and Antivirals	9	0	5	5	100	56
Dec 2007	Catalyst Grants: Mobilization of the Research Community	14	0	5	5	100	36
Jan 2008	Team Grant: Pandemic Preparedness - Influenza Biology, Vaccines, Ethics, Legal and Social Research	15	0	13	9	69	60
Mar 2008	Partners for Health Systems Improvement Funding Opportunity	1	0	1	1	100	100
Mar 2008	China-Canada Joint Health Research Initiative – Grants Program Funding Opportunity	3	2	1	1	100	100
June 2008	Catalyst Grant: Pandemic Outbreak Team Leader	3	1	2	2	100	67
Oct 2008	Catalyst Grant: Pandemic Preparedness	7	2	3	3	100	60
Dec 2008	Influenza Research Network	1	0	In peer review	-	-	-
	<b>TOTAL</b>	<b>149</b>	<b>10</b>	<b>77</b>	<b>71</b>	<b>92</b>	<b>51%</b>

\* For partner-led funding opportunities, # of applications received = # of relevant applications received.

\*\* This grant was successful but funded by another source



As Table 11 indicates, some of the program components did not generate any applications. These include the first round of Knowledge Synthesis Grants; all three rounds of Meetings, Planning and Dissemination Grant: End of Grant Knowledge Translation Supplement; and the first two rounds of Meetings, Planning and Dissemination Grants. Taken together, these results could suggest a lack of readiness for knowledge translation, perhaps because the research had not yet advanced enough to be able to identify what knowledge could be transferred. Alternatively, it could suggest a low level of interest among the pandemic research community in carrying out knowledge translation projects, a lack of familiarity or comfort with strategic funding in this area, or perhaps a lack of fit of these funding tools with the types of activities knowledge translation that are relevant to pandemic preparedness and influenza.

As well, after review, no applications were funded under the Operating Grant for Transmission, Public Health Measures and Compliance. Data from both the researcher survey and key informant interviews on the PPSRI priorities confirm that this is still an area with a significant research gap.

When asked about their views on the success of program uptake, about two-thirds of key informants were not aware enough to comment. Among those who were, some, including one external partner organization, felt that the funding opportunities had generated an acceptable number of applicants, from the right populations. Others felt that more applications would have been desirable to increase competitiveness, although the lack of capacity and the need to build it through capacity development initiatives such as workshops or training was also emphasized. Some areas where uptake had been weaker were noted: these included public health (notably the non-response to the public health funding opportunity, but more generally as well); risk perception and communication; and ethics review in pandemic situations.

It was also noted by key informants that uptake was not optimal in that not all applications sufficiently reflected the targeted nature of the funding opportunities. It was suggested that perhaps because of a widespread position in the research community that investigator-driven research will address knowledge gaps, researchers sometimes do not respond appropriately to targeted funding opportunities, including submitting applications that are not within the parameters of the funding opportunities, or failing to meet requirements such as inclusion of end-users and a clear knowledge translation component in each project. This is consistent with our interpretation of the researcher survey finding that unsuccessful applicants were less likely than successful applicants and non-applicants to have heard of the PPSRI – even though they had applied to it. (It is important to note that each funding opportunity announcement is accompanied by a detailed background document, with a program description, objectives, eligibility, application guidelines, and criteria used to evaluate applications). This is also supported by a finding that a majority of unsuccessful applicants were unaware of the evaluation criteria, discussed below.

**Adjudication process.** Some key informants also commented on the adjudication process (perhaps more generally than the PPSRI), noting that it had included more than just the “usual suspects”, i.e., had been more inclusive. At the same time, the difficulty of ensuring adequate





review without conflict of interest for grants with large numbers of investigators (such as the team grants) was noted. A consequence of this, according to key informants, is that applications are reviewed by only a subset of the full peer review committee; i.e., their review is not as thorough because some members must recuse themselves. The use of only committee members' reviews, without external reviewers, was also criticized by key informants as having resulted in less than adequate reviews.

The researcher survey also included questions on the PPSRI adjudication process. Although about two-thirds of applicants were not knowledgeable enough to answer the questions, among those who could offer an opinion, the results suggest some dissatisfaction overall with the adjudication processes and communication of results:

- a minority of both funded applicants (40%) and unsuccessful applicants (17%) agreed that the PPSRI's peer review committees had adequate expertise. This is a troubling finding if it reflects a veridical assessment of committee credibility, although it may represent a generalized tendency for researchers to believe that they are the most expert in their domain.
- less than half of funded applicants (44%), who would be expected to be most satisfied with their outcomes, agreed or strongly agreed that the funding decisions were fair.
- only about half (49%) of those funded agreed that they were aware of the criteria used to evaluate their applications. This proportion is even lower, 32%, among those not funded. Although respondents may not have been able to recall if they had been aware of the criteria at the time of the review or may have forgotten them by this point, it is also important to note that the evaluation criteria are published with every funding opportunity.
- About two-thirds of funded applicants (64%) and one-third of unsuccessful applicants (32%) agreed that they had been provided with sufficient information following the adjudication process.

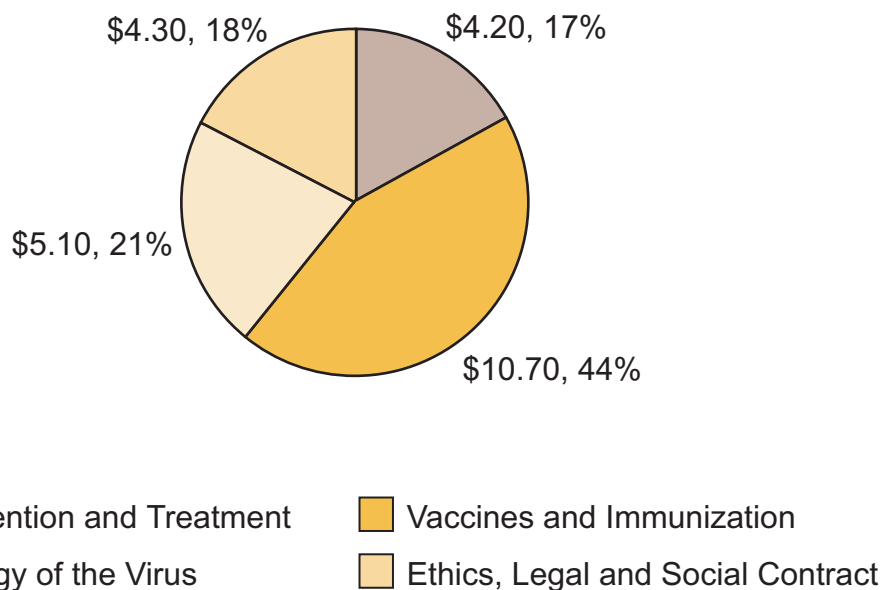
However, it is not possible to say whether similar results would be obtained in researchers' assessments of CIHR peer review processes more generally

### Coverage of the intended research areas

Figure 4 shows investments by PPSRI priority area, as determined by III staff in reviews of funded applications. As of September 2008, the Vaccines and Immunization priority had received about 44% of PPSRI funds, followed by Virus Biology, at 21%. Prevention and Treatment, and Ethics, Legal and Social Contract dimensions have each received about 17% and 18% of the investments, respectively.<sup>31</sup>

<sup>31</sup> [http://www.phac-aspc.gc.ca/cnic-ccni/2008/pres/pdf/dec3\\_richardson.pdf](http://www.phac-aspc.gc.ca/cnic-ccni/2008/pres/pdf/dec3_richardson.pdf)

**Figure 4: Investment by PPSRI Priority Area, committed funds as of September 2008 (\$ millions)**



Key informants interviewed were generally of the opinion that the intended research areas were reasonably well covered by the PPSRI's funded activities. Some gaps were nonetheless noted, including clinical work, modeling, humanities and social sciences. It was also noted by a key informant that researchers involved in modelling appear to be discouraged, as few applications in this area were funded. As noted previously, modeling was one of the priority gaps identified by some researchers.

### Research capacity development

According to key informants who were able to comment on this issue, the PPSRI is providing many new opportunities for capacity development in pandemic preparedness research. This includes the involvement of graduate students and post-doctoral fellows: key informants noted that the PPSRI initiative presents many opportunities for trainees to become involved for their dissertation research or as research assistants. Respondents who had attended the *Canadian Pandemic Preparedness Meeting: From Discovery to Frontlines* noted the presence of trainees, citing this as a very positive example of the PPSRI's impacts on developing pandemic research capacity. According to the registration file, 15 of 172 registrants (9%) named a supervisor, i.e., were trainees. As well, a perceived influx of new researchers over the last several years was remarked upon, into what had been seen previously as "a bit of an old boys' network".

It was suggested in key informant interviews that the PPSRI could develop pandemic specific training initiatives along the lines of the Strategic Training Initiative in Health Research



(STIHR)<sup>32</sup>. However, the Task Group had considered this option and decided to recommend that inclusion of trainees be a requirement on core PPSRI operating and team grant funding opportunities because of the challenges that would be faced in putting together a training program application due to the limited number of principal investigators whose research area and expertise focused on pandemic and influenza.<sup>33</sup>

The importance of the proposal development workshops as a capacity development tool was made clear in several ways by key informants' responses. It was noted that the workshops had been useful for those preparing proposals, but also as a means to engage researchers who may be involved in other areas but could be "sold" on pandemic-related research. The absence of such a process for the international component of the PPSRI was identified as a key drawback that had probably contributed to the overall lack of depth in the applications involving international collaborations.

Researchers responding to the survey were asked to indicate the extent to which their funded project was contributing to capacity development for pandemic preparedness research through engaging researchers from areas or disciplines that had not been involved before, and by shaping new research foci. These data are summarized in Table 12, for the entire sample and by area of research (the categories "vaccines and immunization" and "prevention and treatment" were combined because of the large overlap in their membership). About 60% of funded researchers agreed that the PPSRI was contributing to involvement of researchers from new areas or disciplines. And, about 30% agreed that the PPSRI had contributed to a reorientation of their research focus. Although it is hard to set a target on this latter issue, it suggests that the PPSRI has, while ensuring funding to the core population of researchers already engaged in research relevant to the PPSRI priorities, also succeeded in helping some researchers to focus their research on pandemic-related areas, and in reframing or reorienting others' work to be in line with its strategic capacity development aims.

**Table 12: Impacts of funded projects on research capacity development, by respondent's research area**

	No. (%) agree or strongly agree <sup>1</sup>			
	Vaccines & immunization/ prevention and treatment (n = 56)	Virus biology and diagnostics (n = 31)	Ethical, legal or social aspects (n = 28)	Total (n = 80)
Because of the PPSRI, my research work involves researchers from areas or disciplines that were not involved with my work before.	39 (62%)	21 (72%)	16 (57%)	47 (61%)
The PPSRI has contributed to a reorientation of my research focus.	19 (30%)	11 (36%)	8 (29%)	24 (30%)
<sup>1</sup> There is some overlap between the three categories of research area, as respondents were asked to choose all that applied to their work.				

<sup>32</sup> <http://www.cihir-irsc.gc.ca/e/22174.html>. Some of the existing STIHR projects appear to be in areas related to the PPSRI themes.

<sup>33</sup> Task group minutes, August 31 2006. Also reported in interviews.

As no other data exist as yet on the integration of trainees into PPSRI research projects, questions about student involvement were included in the researcher survey. To avoid double-counting, only NPIs were asked to respond. A total of 53 trainees were involved in the 21 grants reported on by their NPI; on average, this works out to about 2.5 trainees per grant. Table 13 also shows a projection of the number of trainees that might be estimated to be participating in the entire PPSRI. If the respondents are representative of all PPSRI NPIs, we can estimate that the PPSRI has involved about 173 (more prudently, perhaps between 150 and 200) trainees. However, 14% of the grants involved no trainees at any level.

**Table 13: Number of trainees involved in PPSRI grants**

	No. (21 grants)	Avg, per grant	Projection to all research grants <sup>1</sup> (69)
Undergraduate students	14 (range 1 to 5)	1.25	89
Master's students	11 (range 1 to 3)	.75	54
PhD students	10 (range 1 to 5)	1.05	75
Post-doctoral fellows	12 (range 1 or 2)	.65	46
Other types of trainees (research assistant, technician, clinician-scientist, master's practicum)	6 (range 1 or 2)	.35	25
<b>Total</b>	<b>53</b>	<b>2.5</b>	<b>173</b>
<sup>1</sup> Excluding workshops.			

According to six of the responding NPIs (33%), their trainees have been involved in international research collaborations.

The data in Table 14 show that the majority of funded PPSRI researchers agree that their project has involved interdisciplinary training (64%) or mentoring (73%) of students/fellows in influenza and pandemic preparedness research. As well, about two-thirds (68%) of respondents agreed that their project has increased the number of trainees in influenza and pandemic preparedness research. Together with the data in Table 13, these findings suggest that capacity development through training in pandemic research through the PPSRI is occurring. However, as there is no baseline or explicit target other than embedding of training throughout the funding opportunities, it is hard to assess whether this can be seen as in line with expectations.

**Table 14: Role of trainees in funded projects (Funded applicants, including NPIs, n = 84)**

	No. (%) agree or strongly agree
My PPSRI project has included interdisciplinary training for students/fellows.	47 (64%)
My PPSRI project has included mentoring of students/fellows in influenza and pandemic preparedness research.	54 (73%)
My PPSRI project has increased the number of trainees in influenza and pandemic preparedness research.	49 (68%)

### 3.5 Success of PPSRI networking and knowledge translation activities

#### Facilitation of communication and networking

In the key informant interviews, respondents praised the PPSRI for its success in facilitating communication and networking through the organization of the priority setting workshop and the *Canadian Pandemic Preparedness Meeting: From Discovery to Frontlines*, describing this as “fantastic,” “excellent”, “effective” and a “great example of value for money”. III’s approach in this was described as novel and innovative. It was noted that whereas the small research community in Canada is highly disparate and diverse, these events had succeeded in bringing people together who would not have done so otherwise. This resulted in increased awareness among researchers of each others’ work, as well as creating national momentum in pandemic preparedness research: “there is no question that it has created momentum into now a major national effort .... There is excitement in the community and the PPSRI has encouraged them to continue on in the area – many people who would not have worked together.” The meetings provided an opportunity for researchers to learn about other branches of research with which they were less familiar, which was described as useful.

Some key informants noted that a mix of formal (such as the *From Discovery to Frontlines* meeting) and informal opportunities for networking is desirable. This would seem to support the offer of funds for meetings, and underscore the question about why uptake for these has been limited.

Finally, although the momentum gathering through the PPSRI speaks to the health of the initiative, some key informants expressed concern about whether that level of vigour can be maintained if a pandemic does not materialize and after targeted funding ends.

#### Impacts on enhanced collaboration and increased capacity

Over and above increased awareness of pandemic research activity, key informants noted several other impacts of the PPSRI’s networking activities on enhanced collaboration and increased capacity. The participation of trainees in these activities was cited as a very important tool for increasing research capacity. For research partners, benefits were also noted in terms of making connections with other relevant agencies: “While the information presented at the conference is interesting and important, half the take-home is the connections we make at the conferences – PPSRI is doing this very well.... By attending this conference, it will change the way we do our work at (organization) – our position in the Canadian landscape and the impact that we can make. I now know who to contact to make this happen.” Increasing the potential for collaborations between governments and universities, and between human and animal researchers, was described as an important impact of the PPSRI. While in some cases new collaborations have emerged, key informants also cautioned that it may take some time for these to result in increased research capacity. It was pointed out that having researchers who have not worked together before be ready to do so is an element of pandemic preparedness. Because the workshops and



conferences increase their familiarity with each other, even if this does not lead directly to immediate new collaborations, it improves their positioning and readiness for future collaborations, even in emergency situations.

Researchers responding to the survey were asked to indicate the extent to which their funded project was contributing to capacity development for pandemic preparedness research through networking and collaboration with other researchers, including international collaborations. While the majority of respondents in all research domains agreed or strongly agreed that the PPSRI had facilitated networking and collaboration, this agreement was less pronounced for those who had indicated their research area involved ethical, legal or social aspects of pandemic preparedness. About one-quarter of respondents in all research areas (27% overall) agreed that the PPSRI had helped involve international research collaborators in their work.

**Table 15: Impacts of funded projects on research capacity development, by respondent's research area**

	No. (%) agree or strongly agree <sup>1</sup>			
	Vaccines & immunization/ prevention and treatment (n = 56)	Virus biology and diagnostics (n = 31)	Ethical, legal or social aspects (n = 28)	Total (n = 80)
The PPSRI has helped me/my team network with other researchers involved in influenza and pandemic preparedness research.	51 (81%)	25 (83%)	17 (62%)	60 (78%)
The PPSRI has helped me/my team collaborate with other researchers involved in influenza and pandemic preparedness research.	45 (71%)	23 (73%)	17 (63%)	54 (70%)
The PPSRI has helped me/my team involve international research collaborators.	15 (24%)	8 (28%)	7 (25%)	21 (27%)
<sup>1</sup> There is some overlap between the three categories of research area, as respondents were asked to choose all that applied to their work.				

Among the 21 respondents involved in international collaboration in their PPSRI research, 13 (62%) indicated their international collaborators were working jointly with them on the same problems; 11 (52%) indicated that they were working on different aspects of the same problem; and 6 (13%) indicated that their collaborators were working on problems pertinent to their own setting. The locations of the international collaborators were most frequently in the US (12, or 57%) and Europe (8, or 38%); with some collaborations also reported in China, other parts of Asia, Latin America and Africa. It was noted in the key informant interviews that projects supported by the PPSRI for international work tended to involve collaborations among rich countries; the survey data support this observation.



## Groundwork for effective knowledge translation (KT)

The PPSRI KT strategy consists of five components: integrated KT for team grants; research synthesis grants; KT end-of-grant supplements; meeting, planning and dissemination grants; and an annual meeting of researchers and knowledge users<sup>34</sup>. As shown above in Table 11, uptake of these funding opportunities specifically for KT (research synthesis grants; KT end-of-grant supplements; meeting, planning and dissemination grants) has been slow; as more funded grants move towards completion, it would be expected that uptake will increase.

The first meeting of researchers and knowledge users, the *Canadian Pandemic Preparedness Meeting: From Discovery to Frontlines*, was held November 6-8, 2008 in Winnipeg. According to the meeting registration data, among the 157 non-student registrants, 45 (29%) were potential research users: public health or health care practitioners, industry representatives, program administrators or decision-makers. While some key informants noted with satisfaction the presence of end-users at the *From Discovery to Frontlines* workshop, others felt that more managers, policy-makers and decision-makers could have been present.

Key informants were asked for their views on the likelihood that there will be sufficient knowledge translation of the results from the funded projects. Many stated that it was too early to tell, and noted that while important, this area was challenging for many researchers. In particular, challenges were noted with integrating end-users into research teams, because they are fully committed in other organizations (and in some cases, notably provincial governments, do not seem to value participating in research), as well as the exigencies of the CIHR application and CV requirements. From III's perspective, the strategy of requiring projects to include end-users from the beginning of project design will hopefully pay off, but they too find it is too early to predict this outcome. However, the lack of uptake of the funding opportunities for planning and dissemination activities is worrisome to III as it may indicate a lack of interest or readiness to engage actively in knowledge translation, or a lack of clarity among biomedical researchers about what KT is.

Indeed, it was noted in key informant interviews that the priorities retained for the PPSRI reflect CIHR's strong tradition of curiosity-driven research, and that CIHR and III have only recently begun signaling the research community that they wish to support very specific research areas. According to this view, response from the research community was also mainly driven by investigator interests. This was seen as limiting the capacity of the PPSRI to contribute to pandemic preparedness: *"I think the problem was that there is some difficulty in achieving true preparedness. In a sense CIHR is going about it in the wrong way.... – investigators apply for opportunities, but not necessarily apply to do things that were most relevant". This recognizes the challenge of "trying to move the community of scientists to the most relevant types of research to assist with pandemic preparedness".* As previously noted, one of the main partner organizations noted that

<sup>34</sup> [http://www.phac-aspc.gc.ca/cnic-ccni/2008/pres/pdf/dec3\\_richardson.pdf](http://www.phac-aspc.gc.ca/cnic-ccni/2008/pres/pdf/dec3_richardson.pdf); <http://www.researchnet-recherchenet.ca/rnr16/viewOpportunityDetails.do?prog=359>

because they could not know which research questions would end up being addressed once the funds were awarded, they had kept aside a portion of the funds for directed research under contract, “so that we were sure some of our priorities would be covered”.

Researchers responding to the on-line survey were asked to provide some indicators of knowledge translation activities in their work, including the involvement and roles of research users and the presence of KT plans. These questions had relatively high levels of ‘don’t know responses’, about 15% of respondents overall. For those researchers who could respond, these data are shown in Table 16. More than three-quarters of respondents stated that research users either were (47, or 66%) or would eventually be (14, or 21%) involved in their PPSRI project. This proportion was similar for all three research areas. Almost three-quarters (73%) acknowledged having a knowledge translation plan in place. This proportion was highest, 82%, among respondents who indicated that their work was related to ethical, legal or social aspects of pandemic preparedness, whereas it was lower among researchers engaged in vaccine (68%) and virus (58%) research.

**Table 16: Knowledge translation in PPSRI projects (No. (%) agree or strongly agree)**

	Vaccines & immunization/ prevention and treatment (n = 62)	Virus biology and diagnostics (n = 31)	Ethical, legal or social aspects (n = 28)	Total <sup>1</sup> (n = 80)
Research users are currently involved in my PPSRI project.	38 (59%)	15 (48%)	19 (68%)	47 (66%)
Research users will eventually become involved in my PPSRI project.	12 (24%)	(26%) 8	*	14 (21%)
My PPSRI project has a knowledge translation plan in place.	40 (68%)	18 (58%)	23 (82%)	53 (73%)
<sup>1</sup> There is some overlap between the three categories of research area, as respondents were asked to choose all that applied to their work. *Ns of less than 5 are not shown.				

Governments are the most frequently named type of research users currently involved in PPSRI projects (70%), followed at a distance by non-governmental organizations (24%) and other types of public-sector entities (health care professionals, laboratories, regulatory bodies, health agencies/institutions). Pharmaceutical companies are involved as research users in 19% of projects where users are currently involved. As would be expected, the vast majority (87%) of these research users’ roles include application or use of the results. In addition, 55% of responding researchers said that users are involved in carrying out some parts of the research, 49% in developing the research questions, and 40% in interpretation of the results. These latter findings suggest that integrated knowledge translation, where research users and researchers dialogue on the research questions, methods and findings throughout the entire research process, is not widespread among PPSRI researchers.





## 4. CONCLUSIONS

The aim of this midterm evaluation was to assess the overall design and implementation of the Pandemic Preparedness Strategic Research Initiative, in order to inform future development and identify potential areas for improvement. At the halfway point of this five-year initiative, and within the context of its overall goal of improving Canada's ability to prevent and/or respond to an influenza pandemic, a number of early conclusions can be drawn. These are presented in terms of the extent to which the PPSRI is producing its desired outputs and early outcomes, as captured by responses to the evaluation issues and questions.

### 4.1 How effective was the PPSRI's priority setting?

**Findings:** The evaluation findings suggest that in most areas, an effective organizational model was developed and implemented, facilitating the identification and implementation of strategic pandemic research priorities. The mechanisms for identifying research priorities were inclusive and effective, and have resulted in a sound set of priorities that are widely endorsed. Other priorities were nonetheless identified, along with concern about spreading limited resources too thinly across theme areas that are too broadly defined.

The PPSRI's identified priorities have been faithfully translated into funding opportunities that capitalize on existing programs and structures within and outside of CIHR. This has resulted in the introduction of timely and attractive funding opportunities to the research community.

The processes for identifying priorities have not created widespread perceptions of conflict of interest, but such perceptions exist in a small proportion of the potential pandemic research community.

**Suggestions for improvement:** It may be opportune to consider reassessment of the pandemic and influenza strategic research priorities taking into consideration the strengths of what has been funded so far, remaining gaps and emerging issues<sup>35</sup>.

### 4.2 How effectively has the PPSRI built national and international partnerships?

**Findings:** The PPSRI has identified and created effective linkages with the Public Health Agency of Canada, the Canadian Food Inspection Agency, and the Health Research Foundation. These have led to partnered funding opportunities that have satisfied the interests of all partners and have leveraged a significant amount of additional funds, more than doubling the amounts available through CIHR for pandemic preparedness research.

<sup>35</sup> The PPSRI priority setting process included all of the process elements identified as essential for successful healthcare priority setting by Sibbald et al (2009): (stakeholder engagement; use of explicit process; information management; and consideration of values and context) except revision or appeal mechanisms.





Linkages with international research efforts in pandemic preparedness have not been as successful to date, not because of lack of effort or will. At the institutional level, the evaluation results reflect the need to take into consideration during program design and implementation the considerable complexity and time lags associated with international partnerships. At the level of funded research, less than 30% of researchers credit the PPSRI with strengthening their international collaboration. Partnerships at the level of researchers have tended to concentrate in countries with existing research capacity. Students involved in about one-third of the grants have been integrated into international collaborations.

**Suggestions for improvement:** The findings suggest that the PPSRI will need to continue efforts to establish linkages with international agencies and strengthen the partnership with IDRC. The group of PPSRI researchers who are involved in international collaborations could be solicited to help identify pathways to increased international research linkages throughout the PPSRI.

### 4.3 How appropriate was the PPSRI's design?

**Findings:** The PPSRI's program design has created a platform for the achievement of expected short term results, although some of these remain to be fully achieved. A first result is a national pandemic preparedness research agenda that is much more coordinated than it would have been in the absence of the PPSRI, as evidenced by the findings that: a) partners had not worked together before in this area; and b) III worked effectively towards buy-in and adaptation to ensure ongoing partner engagement. This national agenda covers all four of CIHR's theme areas (biomedical, clinical, health systems and services, and population and public health) in its design (but not necessarily its implementation). It has likely reduced duplication among Canadian funding initiatives available to Canadian pandemic researchers and has combined resources from the multiple sources effectively.

**Suggestions for improvement:** Reasons for lower than expected uptake of some program components could be explored, as they may reflect design issues. Otherwise, the program design to date has largely been successful and there is no evidence to suggest it should not be pursued along the same lines.

### 4.4 Have the desired funding opportunity outputs been produced?

**Findings:** The PPSRI has successfully launched about 30 targeted funding opportunities, reflecting strategic research priorities. These were launched in a timely manner despite significant time pressures. The challenges in mounting a large, multi-faceted targeted initiative within a five-year funding window were considerable, and while most of these challenges were successfully faced, one important consequence was reduced duration of some of the grants offered, compared to the original intent.



In most cases, the funding opportunities reached and attracted applications from the relevant research community. There is, however, some lack of awareness of the program and some evidence that communications about it have not been maximally effective.

Researchers' responses to the suite of funding opportunities offered through the PPSRI have resulted in a large body of funded research. The relatively high funding rate for applications of meritorious scientific quality may confirm the Task Group's identification of the need for capacity building. As well, the lack of applications in some areas that were identified as key knowledge gaps led in turn to a lack of targeted research. This indicates that alternate strategies may need to be developed to achieve the advances in knowledge that were judged to be necessary for an effective pandemic response. This is especially true in the area of public health measures.

The evaluation results confirm that research capacity development is occurring, through several avenues. It can be estimated that the PPSRI is currently engaging between 150 and 200 trainees in pandemic preparedness research, or about 2.5 trainees per grant. The PPSRI is also contributing to the integration of new collaborators and reorientation of research foci.

**Suggestions for improvement:** More aggressive capacity building and targeted promotion of pandemic public health research, including long term training approaches and/or application development support, may be needed in specific areas. The intended embedding of training within all PPSRI components could perhaps be somewhat intensified, as about 15% of grants involve no trainees. Communications about the program could also be examined with a view to increasing awareness and drawing researchers' attention to funding opportunities and their specificities.

#### 4.5 How successful are the PPSRI's networking and KT activities?

**Findings:** The PPSRI's networking activities such as application development workshops, and in particular, the first annual meeting of researchers and end-users, have been very successful. These are seen as an innovation with immediate and potential benefits to researchers, trainees and research users.

It is too soon to tell whether the PPSRI – as a targeted strategic initiative where, in principle, all funded research would contribute directly or indirectly, immediately or eventually, to pandemic preparedness – is maximally facilitating knowledge translation towards the AI/PI Strategy goals of reducing illness deaths and societal disruption from influenza pandemic. However, a significant proportion of funded research projects, about three-quarters, have knowledge translation plans in place, and end-users are currently involved in about two-thirds (66%) of funded projects. This is seen by III as clearly an improvement over existing, non-targeted programs, a result of it having been a program requirement in some of the PPSRI funding opportunities and strongly encouraged in others. Events such as the first annual meeting of researchers and end-users are also contributing to knowledge translation potential. There has nonetheless been very limited uptake of the funding tools made available through the PPSRI to facilitate knowledge translation.



**Suggestions for improvement:** If possible, the PPSRI networking activities should be continued and expanded.<sup>36</sup> Some needs assessment may be helpful to better understand the barriers and facilitators<sup>37</sup> to engaging in effective KT and end-user integration, especially among vaccine and virus researchers. As well, the development and implementation of KT skills development opportunities such as workshops<sup>38</sup>, for both researchers and end-users, may be considered. More direct promotion and marketing of KT and KT capacity development opportunities to funded researchers could help ensure that uptake of the PPSRI's KT funding opportunities will strengthen. These efforts should prioritize those researchers whose funding will end in 2009. Some financial incentive for KT integration may also be considered, for example by stipulating that a fixed proportion of grant funds be used for KT.

## 4.6 Overall conclusion

Overall, the design, delivery and initial outputs of the PPSRI are ensuring that the overall goals for the PPSRI, of improving Canada's pandemic preparedness and of increasing pandemic preparedness research capacity, can be achieved.

Areas identified for additional support or perhaps alternative strategies to ensure that they can maximally contribute to the achievement of objectives include: development of a coordinated international research agenda; stimulating pandemic preparedness research with a public health focus; and, facilitating broader engagement of the influenza research community with more elements of the PPSRI's KT strategy. Capacity development through the engagement of trainees and other strategies could also be reinforced, as some evidence suggests that higher application pressure would be desirable. Communications about the PPSRI could also ensure that the research community is aware of the initiative and all its specificities.

The evaluation findings show that the PPSRI has been especially successful in developing solid and productive partnerships with national agencies, developing consensus on research priorities and implementing tools to address those priorities. It has also been shown to be successful in creating platforms to foster networking and eventual collaboration that engage researchers, trainees and potential research users. Further, it has resulted in significant resource leveraging for pandemic preparedness research and the funding of excellent research. These strengths provide a solid foundation for continued success as the PPSRI moves forward.

<sup>36</sup> Partnerships between end-users and researchers are key to ensuring research impacts on policy and practice. These are most effective when they involve interpersonal strategies other than only written information. Kalucy et al, 2009. Exploring the impact of primary health care research. [http://www.phcris.org.au/phplib/filedownload.php?file=/elib/lib/downloaded\\_files/publications/pdfs/phcris\\_pub\\_8108.pdf](http://www.phcris.org.au/phplib/filedownload.php?file=/elib/lib/downloaded_files/publications/pdfs/phcris_pub_8108.pdf); Jacobson N et al. 2003. "Development of a framework for knowledge translation: understanding user context." *Journal of Health Services Research & Policy*; 8(2): 94-99.

<sup>37</sup> This should include organizational barriers as well as professional and personal ones: Jacobsen, Butterill & Goering, 2004. <http://scx.sagepub.com/cgi/content/abstract/25/3/246>

<sup>38</sup> Existing frameworks and tools may be adapted to the pandemic preparedness context: e.g. <http://www.sickkidsfoundation.com/grants/downloads/knowledge/GuideKnowledgeTranslationPlans.pdf>; <http://www.sickkidsfoundation.com/grants/ktMethod/kttemplate.doc>



## APPENDICES

### **Appendix 1: Members and Mandate of the PPSRI Midterm Evaluation Steering Committee**

#### **Members**

- Carol Richardson (CIHR Institute of Infection and Immunity)
- Michelle Hume (CIHR Institute of Infection and Immunity)
- Susan Crawford (CIHR Institute of Aging)
- Bruno Théorêt (CIHR Evaluation Unit)
- Paul Kenney (Centre for Excellence in Evaluation and Program Design, PHAC)
- Heather Deehan (Public Health Network Pandemic Preparedness, PHAC).

The consultants hired to conduct the midterm evaluation attended Steering Committee meetings and participated, but were not members.

#### **Mandate (termed “expectations” in the Committee’s Terms of Reference document)**

As stated in the Committee’s Terms of Reference, the Midterm Evaluation Steering Committee will be responsible for the following:

- “Review of key products from the consultants, including but not limited to: the evaluation framework; evaluation instruments; key informant lists; preliminary findings; and evaluation reports;
- Advice on areas for improvement of key products, and identification of issues that require further consideration by consultant team.”



## Appendix 2: Evaluation questions, indicators and data sources

Issue and Question	Indicators	Data sources
<b>1. Effectiveness of priority setting</b>		
<p>1.1 To what extent were the PPSRI research priority setting processes appropriate, in terms of timeliness, mechanisms, and inclusivity of a) research areas and b) groups of researchers?</p> <p>1.2 How successful were the research priority setting processes – to what extent did they arrive at the most appropriate set of priorities for Canadian research in pandemic preparedness?</p> <p>1.3 To what extent was national and international duplication of effort avoided, and complementarity enabled?</p> <p>1.4 How necessary, appropriate (in terms of role and composition) and effective was the Task Group?</p>	<p>Stakeholders' views of appropriateness Researchers' perceptions of COI</p> <p>Stakeholders' views of appropriateness Researchers' ratings of priorities</p> <p>Stakeholders' views of appropriateness Researchers' ratings of priorities</p> <p>Stakeholders' views of appropriateness and effectiveness Researchers' perceptions of fairness, COI</p>	<p>Key informant interviews: Section 2 Researchers survey Q4-9</p> <p>Key informant interviews: Section 2 Researchers survey: Section E</p> <p>Key informant interviews Q2.2,</p> <p>Key informant interviews Q2.3</p>
<b>2. Effectiveness of partnership development</b>		
<p>2.1 To what extent has the PPSRI been successful in building national and international partnerships? Which partnerships have been most and least successful? Are there partnerships that should be developed but have not been?</p> <p>2.2 What have been the impacts of partnerships on: a) coordination and integration of national and international research programming; b) resource leveraging; c) research duplication and complementarity?</p> <p>2.3 To what extent have the partnership structure and reporting strategy been effective in supporting the ongoing initiatives of partners, including the PPSRI?</p>	<p>Stakeholders' views of effectiveness</p> <p>Stakeholders' views of impacts Documentation of partnerships, resources leveraged</p> <p>Stakeholders' views of effectiveness</p>	<p>Key informant interviews Q3.1-3.3</p> <p>Key informant interviews Q3.1-3.3 Review of documentation</p> <p>Key informant interviews Q3.4</p>
<b>3. Appropriateness of program design</b>		
<p>3.1 To what extent is the suite of activities and funding programs offered through the PPSRI allowing the achievement of program objectives? Which components are most and least successful?</p> <p>3.2 Is the overall strategy of strategic competition effective in ensuring that the most promising research is funded? Would an alternative strategy including the enabling "front-runners" (recognized leaders in the relevant fields) to continue to pursue relevant PP research) be more effective? Is this the most effective strategy to ensure short and long term capacity development?</p>	<p>Stakeholders' views of appropriateness, Researchers' ratings of incentive features Uptake/quality of response to program components</p> <p>Stakeholders' views of effectiveness Researchers' views of effectiveness</p>	<p>Key informant interviews Q4.1 Researcher survey Q3 Administrative databases</p> <p>Key informant interviews Q4.1 Researchers survey Q21-23</p>

Appendix 2 continued

Issue and Question	Indicators	Data sources
<b>1. Effectiveness of priority setting</b>		
3.3 How effective was the communication strategy used to launch the funding opportunities?	Stakeholders' views of effectiveness Researchers level of awareness and ratings of effectiveness	Key informant interviews Q4.2 Researcher survey Q1, Q3, Q10
<b>4. Achievement of desired funding opportunity outputs</b>		
<p>4.1 To what extent have the funding programs generated expected and/or desirable uptake from the relevant research communities?</p> <p>4.2 To what extent do the sets of funded projects cover the intended field of program objectives? Which objectives streams are more and less well represented across funded projects?</p> <p>4.3 To what extent will the funded projects result building in research capacity in areas related to pandemic preparedness (e.g., training of students, redirection of research foci, new investigators on teams)</p>	<p>Stakeholders' views of uptake and coverage Per competition and per program stream: No. of applications, no. of awards, success rate (including successful-unfunded and funded), amounts awarded; disciplinary diversity of applications and awards; national and international collaborations involved in applications and awards; Comparisons on the above variables between successful and unsuccessful applicants</p> <p>Stakeholders' view of capacity development opportunities No. of students and fellows involved in applications and awards, by level per program stream No. of investigators newly involved Evidence of change of research foci</p>	<p>Key informant interviews Q5.1-5.2 Administrative databases</p> <p>Key informant interviews Q5.3, 5.4 Researcher survey Q13,14, 19, 20 Administrative databases</p>
<b>5. Success of PPSRI networking and KT activities</b>		
<p>5.1 To what extent to which the PPSRI has successfully facilitated communication and networking among researchers involved in pandemic preparedness research? Have all relevant teams and individuals been provided with networking opportunities, and what has been the uptake?</p> <p>5.2 To what extent are communication and networking producing the expected results in terms of enhanced collaboration and increased capacity?</p> <p>5.3 To what extent has the groundwork been put in place for effective knowledge translation to occur (e.g., inclusion of end-users, KT plans)?</p>	<p>Stakeholders' views of success Researchers' ratings of networking Documentation of participation in networking activities</p> <p>Stakeholders' views of success Researchers' ratings of networking impact</p> <p>Stakeholders' views of success Proportion of funded projects with KT plans Degree and type of involvement of research users</p>	<p>Key informant interviews Q6.1 Review of program documentation</p> <p>Key informant interviews 6.2 Researcher survey Q11,12,15</p> <p>Key informant interviews Q5.4 Researcher survey Q17-18 Administrative databases</p>

### Appendix 3: Documents reviewed

Proceedings of the Influenza Research Priorities Workshop, August 31 - September 1, 2005.

<http://www.cihr.ca/e/30967.html>

CIHR Pandemic Preparedness Research Initiative Logic Model, Draft, June 2006.

Task Group meeting minutes: June 16, June 23, June 29, July 6, July 13, July 20, August 3, August 31, 2006.

Consultation on the Draft Research Priorities for the Canadian Institutes of Health Research Pandemic Preparedness Research Initiative, 2006

PPSRI Application Development Workshops Report, March 2007

[http://www.cihr-irsc.gc.ca/e/documents/iii\\_adw\\_report\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/iii_adw_report_e.pdf)

Pandemic Preparedness Strategic Research Initiative - Report on Activities & Outcomes

<http://www.cihr.ca/e/32573.html>, January 2008

Report on the Influenza Research Network Application Development Workshop, February 2008,

[http://www.cihr-irsc.gc.ca/e/documents/irn\\_app\\_dev\\_workshop\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/irn_app_dev_workshop_e.pdf)

Logic Model for Avian and Pandemic Influenza (AI/PI) Preparedness, June 24 2008, v. 3.7

Avian and Pandemic Influenza (AI/PI) Preparedness Performance Measurement and Evaluation Plan, Final Draft October 2008

Pandemic Peer Review Committee Meeting, December 16, 2008: End of Meeting Discussion Summary

Overview of the Canadian Institutes of Health Research Funding Program. Presentation by Carol Richardson at the Canadian Immunization Conference, 2008.

[http://www.phac-aspc.gc.ca/cnic-ccni/2008/pres/pdf/dec3\\_richardson.pdf](http://www.phac-aspc.gc.ca/cnic-ccni/2008/pres/pdf/dec3_richardson.pdf)

CIHR Pandemic Preparedness Strategic Research Initiative Activities, Outputs and Outcomes, undated



## Appendix 4: Instruments

### Key informant interview guide, v4 (19.12.08)

**Interviewee:** \_\_\_\_\_

**Interviewer:** \_\_\_\_\_

**Date:** \_\_\_\_\_

Thank you for agreeing to participate in this evaluation of the Pandemic Preparedness Strategic Research Initiative. Its objective is to assess the overall design and implementation of the Initiative, in order inform future developments in the PPSRI, as well as similar strategic initiatives to be undertaken by III.

*Note that interviewees will be asked to respond to only those questions for which they judge they can contribute an informed opinion.*

#### I. INTRODUCTION

1.1 To begin, could you please describe how familiar are you with the Initiative? What has been your involvement with the PPSRI?

#### 2. EFFECTIVENESS OF PRIORITY SETTING

2.1 What is your overall opinion on the research priority setting processes implemented under the PPSRI? Which aspects seemed to work well? Which aspects seemed to not work so well?

*Follow up if not addressed in response provided above* - To what extent were the PPSRI research priority setting processes appropriate?

*Follow up if not addressed in response provided above* - How would you assess the processes in terms of:

- Timeliness?
- The consultation mechanisms used?
- Who was and was not involved?

a) What alternatives do you consider might have been more appropriate? What changes would make improvements?

**2.2 What is your overall opinion on the actual set of priorities that have been selected for Canadian research in pandemic preparedness?**

*Follow up if not addressed in response provided above - To what extent did the process arrive at the most appropriate set of priorities for Canadian research in pandemic preparedness?*

a) When you consider the actual set of priorities selected, is there any national and/or international duplication of effort with this set of priorities?

- If yes, in which areas? What changes to the process of priority setting would have assisted in avoiding duplication?
- If no, how was this avoided?

b) When you consider the actual set of priorities selected, is there sufficient room for complementarity with other initiatives?

- If yes, how was this achieved? With which other initiatives?
- If no, what changes to the process of priority setting would have assisted in ensuring or enhancing complementarity with other initiatives?

**2.3 Were you involved with the CIHR Pandemic Preparedness Task Group? How effective was it as a priority setting mechanism for the PPSRI?**

*Follow up if not addressed in response provided above - what are your observations and opinions with respect to:*

- How necessary it was to convene such a group
- Task Group's role
- Membership

a) What alternatives do you consider might have been more appropriate or effective? What changes would make improvements?

**3. EFFECTIVENESS OF PARTNERSHIP DEVELOPMENT**

**3.1 To what extent has the PPSRI had an influence on national and international partnerships? (Describe observed impacts)**

*Follow up if not addressed in response provided above - what are your observations and opinions with respect to:*

- Which partnerships have been most and least successful?
- Partnerships that should be developed but have not been - which ones, and why?
- What alternatives do you consider might have been more successful?

3.2 As far as can be seen at this point, what have been the impacts of partnerships on:

- coordination and integration of national and international research programming?
- resource leveraging?
- research duplication and complementarity?

a) What alternatives do you consider might have generated more impact? What changes would make improvements?

3.3 What are your opinions and observations on the outcome(s) that the partnership structure under the PPSRI has had on ongoing initiatives of partners? On the PPSRI itself? *(Describe observed outcomes)*

a) What alternative partnership structures do you consider might have been more effective? What changes would make improvements?

3.4 What are your opinions and observations on the outcomes(s) that the reporting strategy of the PPSRI has had on ongoing initiatives of partners? On the PPSRI itself? *(Describe observed outcomes)*

a) What alternative reporting strategies do you consider might have been more effective? What changes would make improvements?

#### 4. APPROPRIATENESS OF PROGRAM DESIGN

4.1 What is your perspective on whether or not the set of funding opportunities offered is assisting the PPSRI in achievement of the Initiative's objectives?

*Follow up if not addressed in response provided above -*

- Which of the funding opportunities do you consider most and least successful?
- Are there gaps in the funding opportunities made available so far? If so, which?
- Is the overall approach of strategic competition effective in ensuring the most promising research is funded? What would have been alternatives? How would they have been more effective?
- Is this the most effective approach to ensure both short and long term capacity development? What would have been alternatives? How would they have been more effective?

a) What alternative funding opportunities do you consider might have been more appropriate? What changes would make improvements?

4.2 What are your main observations on the communication strategy used to launch the funding opportunities?

*Follow up if not addressed in response provided above -*

- Which aspects of the communications do you consider most and least successful?
- a) What alternatives do you consider might have been more effective with respect to the communication strategy? What changes would make improvements?

**5. ACHIEVEMENT OF DESIRED FUNDING OPPORTUNITY OUTPUTS**

5.1 What is your perspective on the uptake of the funding programs?

*Follow up if not addressed in response provided above - what are your observations and opinions with respect to:*

- Whether or not the relevant research communities responded to the RFAs
- Have there been gaps in response? If so, which areas? Which teams? Which key players?
- The quality of submissions (e.g., teams, proposed projects)

a) What alternatives do you consider might have generated more satisfactory uptake? What changes would make improvements?

5.2 What are your thoughts with respect to the level of coverage across the intended fields of research priorities?

*Follow up if not addressed in response provided above - what are your observations and opinions with respect to:*

- Which priorities are more and less well represented across funded projects
  - Vaccines and immunization
  - Virus biology and diagnostics
  - Prevention and treatment
  - Ethics, legal and social contract

a) What alternatives do you consider might have generated more satisfactory coverage? What changes would make improvements?

5.3 What is your opinion with respect to whether or not the funded projects will result in research training in areas related to pandemic preparedness?

*Follow up if not addressed in response provided above -*

- Would these training opportunities likely have existed without PPSRI funding?

a) What alternatives do you consider might have generated more training opportunities?

5.4 What is your opinion on the likelihood that there will be sufficient knowledge translation of the results from the funded projects?

*Follow up if not addressed in response provided above -*

- Do project proposals include realistic, relevant plans for knowledge translation?
- Are there the appropriate end-users involved in project teams for this to occur?

a) What alternatives do you consider might ensure appropriate knowledge translation occurs for projects?

## 6. SUCCESS OF PPSRI NETWORKING ACTIVITIES

6.1 From your observations, what impact has the PPSRI had on the facilitation of communication and networking among researchers involved in pandemic preparedness research?

*Follow up if not addressed in response provided above -*

- How has the PPSRI facilitated communication and networking? (examples)
- What are the more formal vs. more informal opportunities provided?
- Have all relevant teams and individuals been provided with networking opportunities?
- How satisfactory has been the uptake of these opportunities?

a) What alternatives do you consider might have been more successful? What changes would make improvements?

6.2 Have you observed whether or not the communication and networking activities had any impacts on enhanced collaboration? Increased research capacity?

*Follow up if not addressed in response provided above -*

- If yes, how was this achieved? Are these more formal or informal activities?
- If no, what changes to these activities would have assisted in ensuring or enhancing collaboration? Increasing research capacity?

## 7. FINAL COMMENTS

7.1 Do you have any other comments on the PPSRI and how it, for future strategic initiatives, might be improved?

*Thank you for your collaboration!*

## E-survey of researchers

### Cover E-mail

Thank you for your interest in the evaluation of the Pandemic Preparedness Strategic Research Initiative (PPSRI).

**Purpose:** This survey is part of the midterm evaluation of the PPSRI, being conducted by the Institute of Infection and Immunity (III) of the Canadian Institutes of Health Research (CIHR). The evaluation will assess the overall design and implementation of the PPSRI, in order to inform future developments in this initiative, as well as similar strategic initiatives to be undertaken by III.

**Deadline:** Please complete this survey by February 28, 2009.

**Questions:** If you have any questions about the evaluation or the survey, please do not hesitate to contact Celine Pinsent, Project Manager, at 613-230-5577 X 226 or cpinsent@ggi.ca, or Carol Richardson, at 519-661-3228 or carol.richardson@schulich.uwo.ca.

### Web-based Survey

#### A. AWARENESS

1. I have heard of the Pandemic Preparedness Strategic Research Initiative.

- Yes
- No
- Don't know

2. My research work is relevant to pandemic preparedness and influenza research in the following areas:

- Vaccines and immunization
  - Yes
  - No
  - Don't know
- Virus biology and diagnostics
  - Yes
  - No
  - Don't know
- Prevention and treatment
  - Yes
  - No
  - Don't know
- Ethical, legal or social aspects
  - Yes
  - No
  - Don't know



- Other area related to pandemic preparedness and influenza research:

- Yes
- No
- Don't know

If yes to above: Please specify which other area:

## B. DECISION TO APPLY

### APPLICANTS TO THE PPSRI FUNDING OPPORTUNITIES

3. Were any of the following a factor in your decision to submit your proposal to the PPSRI?

- Yes  No Degree of fit of my research with the themes
- Yes  No Qualifications of me and my co-applicants
- Yes  No Size of the grants offered
- Yes  No Type of grants offered (e.g., team grants)
- Yes  No Duration of the grants offered
- Yes  No Relative prestige compared to other programs available
- Yes  No Program seemed to be targeting specific groups of researchers
- Yes  No Expected involvement of students in the project
- Yes  No Needed more research funding
- Yes  No Timing of RFA was good
- Yes  No Past experience with applications to CIHR
- Yes  No Thought my/our chances of success were good
- Yes  No Other reasons: \_\_\_\_\_

### NON-APPLICANTS TO THE PPSRI FUNDING OPPORTUNITIES

3. Were any of the following a factor in your decision NOT to submit a proposal to the PPSRI?

- Yes  No Was not aware it existed
- Yes  No Degree of fit of my research with the themes
- Yes  No Qualifications of me and my co-applicants
- Yes  No Size of the grants offered
- Yes  No Type of grants offered (e.g., team grants)
- Yes  No Duration of the grants offered
- Yes  No Relative prestige compared to other programs available
- Yes  No Program seemed to be targeting specific groups of researchers
- Yes  No Expected involvement of students in the project
- Yes  No Already had enough research funding
- Yes  No Timing of RFA was poor
- Yes  No Past experience with applications to CIHR
- Yes  No Thought my/our chances of success were not good enough
- Yes  No Other reasons: \_\_\_\_\_



**ALL SUCCESSFUL AND UNSUCCESSFUL APPLICANTS TO THE PPSRI FUNDING OPPORTUNITIES**

**C. VIEWS OF THE DESIGN AND COMPETITION PROCESS**

**To what extent do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree	Don't Know
4. I felt there was conflict of interest in the way the PPSRI was designed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The PPSRI's competitions' peer review committees had adequate expertise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I was aware of the criteria used to judge the PPSRI funding applications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The PPSRI competitions' funding decisions were fair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I was provided with sufficient information with respect to the reason(s) my PPSRI funding application was successful or unsuccessful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I felt there was conflict of interest in the way the PPSRI applications were reviewed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SUCCESSFUL APPLICANTS TO THE PPSRI FUNDING OPPORTUNITIES**

**D. COMMUNICATION, NETWORKING, IMPACTS ON RESEARCH AND KNOWLEDGE TRANSFER**

Please note: if you have received more than one grant through the PPSRI, please answer in terms of the most recent.

**To what extent do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree	Don't Know
10. Communication about the PPSRI has been adequate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. The PPSRI has helped me/my team network with other researchers involved in influenza and pandemic preparedness research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The PPSRI has helped me/my team collaborate with other researchers involved in influenza and pandemic preparedness research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Because of the PPSRI, my research work involves researchers from areas or disciplines that were not involved with my work before.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. The PPSRI has contributed to a reorientation of my research focus.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree	Don't Know
<b>15.</b> The PPSRI has helped me/my team involve international research collaborators.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>15a.</b> (If “agree” or “strongly agree” to question 15) What are the main roles of your international collaborators? Please check all that apply;						
<input type="checkbox"/> Collaborators working jointly on the same problems <input type="checkbox"/> Collaborators working on different aspects of the same problem <input type="checkbox"/> Collaborators working on problems pertinent to their setting <input type="checkbox"/> Other: please specify						
<b>15b.</b> (If “agree” or “strongly agree” to question 15) Where are your international collaborators located? Please check all that apply;						
<input type="checkbox"/> U.S. <input type="checkbox"/> Latin America <input type="checkbox"/> Europe <input type="checkbox"/> Africa <input type="checkbox"/> China <input type="checkbox"/> Other Asia <input type="checkbox"/> Other: please specify: _____						
<b>16.</b> Research users are currently involved in my PPSRI project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>16a.</b> (If “agree” or “strongly agree” to question 16) What types of research users are involved with your project? Please check all that apply.						
<input type="checkbox"/> Pharmaceutical company <input type="checkbox"/> Other type of private sector firm <input type="checkbox"/> Government <input type="checkbox"/> Not-for-profit, NGO organization <input type="checkbox"/> Other: please specify: _____						
<b>16b.</b> (If “agree” or “strongly agree” to question 16) How are the research users involved in your project? Please check all that apply;						
<input type="checkbox"/> Development of research questions <input type="checkbox"/> Carrying out some parts of the research <input type="checkbox"/> Interpretation of the results <input type="checkbox"/> Application or use of the results <input type="checkbox"/> Other: please specify: _____						
<b>16c.</b> (If “strongly disagree”, “disagree” or “neutral” to Q16. Skip if “agree” or “strongly agree” to question 16 ) Research users will eventually become involved in my PPSRI project.						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>17.</b> My PPSRI project has a knowledge translation plan in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree	Don't Know
<b>18.</b> My PPSRI project has included interdisciplinary training for students/fellows.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>19.</b> My PPSRI project has included mentoring of students/fellows in influenza and pandemic preparedness research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>20.</b> My PPSRI project has increased the number of trainees in influenza and pandemic preparedness research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Only if role is Nominated Principal Investigator**

**21.** As of December 31, 2008, how many trainees at each of the following levels have been involved in your PPSRI project? (If none, please enter "0")

- \_\_\_ Undergraduate students
- \_\_\_ Master's students
- \_\_\_ PhD students
- \_\_\_ Post-doctoral fellows
- \_\_\_ Other types of trainees (specify)

**22.** (if the total of Q21 is greater than 0):

Have any of these trainees been involved in international research collaborations?

- Yes
- No
- Don't know

**ALL**

**E. CONTINUED RELEVANCE OF THE STRATEGIES AND PRIORITIES**

**In designing strategic research initiatives such as the PPSRI, funding agencies may use different strategies to maximize the chances of significant advancement in knowledge. With respect to the PPSRI, to what extent to do you agree with the following strategies?**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree	Don't Know
<b>23.</b> Funding should ensure that recognized leaders in the targeted research areas can continue to pursue relevant research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>24.</b> Funding should ensure that all researchers who can possibly make a contribution have the opportunity to compete for funds.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>25.</b> Funding should concentrate on increasing research capacity by targeting researchers and their trainees who are new to the field.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**26. In your view, were there important research priorities NOT included in the PPSRI?**

- Yes
- No
- Don't know

(If yes: Please specify which areas were not included)

**27. In your view, what are the most important research priority areas for pandemic preparedness research over the next five years? Please rate the existing priorities and add any others you wish to rate.**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree	Don't Know
Vaccines and immunization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Virus biology and diagnostics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prevention and treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ethics, legal and social aspects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Others:</b>						
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**F. BACKGROUND**

The following information will help us analyze survey responses according to different types of research and settings.

**28. In which of the following disciplines is your main research experience?**

(Select all that apply)

- Biomedical sciences
- Clinical health sciences
- Health systems and services
- Population and public health

**29. With which type of institution or organization are you associated? (Select all that apply)**

- University
- College
- University-affiliated hospital
- Community-based hospital
- Community-based/volunteer agency or organization
- Government-funded research agency
- Private research organization
- Other (specify)

## G. SUGGESTIONS FOR IMPROVEMENT

30. Do you have any suggestions for improving the PPSRI?

31. Do you have any suggestions for improving other future Institute of Infection and Immunity strategic research initiatives?

*Thank you for your collaboration!*

## **Appendix 5: Other pandemic priority areas identified by researchers for the next five years (96 responses from 60 respondents – 38%; uncorrected verbatim responses)**

### **Themes related to international issues**

- Alignment with global health
- Best practices for International communication and notification and coordinated response
- better understanding of global linkages and movement of diseases and people
- global disparities in infec disease
- global health governance issues
- Identification of specific target areas where Cdn foreign policy can support WHO IHR implementation

### **Themes related to surveillance, applied epidemiology**

- assess real time surveillance
- Disease Surveillance Tools
- novel, “smart” surveillance tools (the next generation of GPHIN, MediSYS, etc.)
- responsive surveillance system as part of pandemic influenza response
- surveillance (2)
- Surveillance and Detection
- Surveillance capacity
- Surveillance system development that can track the influenza realtime and work during a pandemic
- Validation des données de surveillance de l’influenza

### **Themes related to virus evolution**

- Ecology and evolution
- Prevention of viral mutation
- viral evolution

### **Themes related to immune systems, host response**

- Host immune response
- host-pathogen interactions
- Mechanisms of host immune memory development
- Immunogenetics
- Molecular understanding of virus host interaction, virulent factors
- normal (and abnormal) immune responses to Influenza virus
- Vaccine effects in immune compromised subpopulations

### **Themes related to other forms of treatment**

- Non pharmaceutical interventions
- NOT pathogen-specific antiviral drug development
- Novel strategies for treatment

### **Themes related to epidemic management, community health, public health**

- behaviour of HCPs and the citizenry during an outbreak
- Business continuity planning
- community based research
- community health
- Emergency Management
- Enhance Community communications
- Handling the dead
- infection control
- Infrastructure to support response
- logistic aspects of mass vaccination
- operational management of pandemic / disasters
- Optimal use of key logistics during a pandemic
- organisation des soins de santé
- organisationnel

- pediatric psychosocial care
- Prevention and control of seasonal influenza
- Public and Population Health
- Public Education
- Public engagement
- public health
- Resilience training
- Response & Logistics
- response training
- Risk assessment
- training / evaluating competence
- translation of policy into action - how to reach at risk populations, how to best engage community

#### **Themes related to behavioral, social, ethical and political dimensions**

- comportemental
- économique
- Education
- political, geographical and environmental aspects
- politique
- psychologique
- public policy processes
- social determinants of health (2)

#### **Themes related to animal-human transmission, animal response**

- veterinary aspects
- veterinary medicine
- veterinary vaccines
- virulence factors that enable replication in chickens

#### **Themes related to environmental issues**

- atmospheric studies
- quality of the air and airborne diseases
- quality of the waters
- quality of wildlife
- Transportation research

#### **Themes related to the development of antivirals**

- antiviral development
- antiviral drug development
- broad spectrum antiviral drug development
- host antiviral responses
- New antivirals that are less prone to resistance development

#### **Themes related to specific methodologies, including modeling**

- accurate epidemiological and in-host math models to test scenarios and inform pub health decisions
- comparative studies
- Cross-sectoral research
- epidemic disease modeling
- health economic evaluations
- mathematical modeling (effectiveness of intervention, logistics of mass vaccination, . . . )
- Mathematical models for prediction
- mixed methods research
- modeling (2)
- Modeling & Data Collection/analysis during a pandemic
- modeling and comparison of strategies
- Multi-disciplinary collaboration. (We only need better diagnostics if we have viable interventions)
- participatory action research
- qualitative research
- transmission modeling

#### **Other themes**

- Anti-carbohydrate antibodies
- bacterial agents and threats
- Droplets transmission
- Pathogenesis
- Rapid diagnosis
- Pandemic preparedness program evaluation

