Canadian Institutes of Health Research Support for Population Health Intervention Research in Canada

Erica Di Ruggiero, MHSc, RD,¹ Adria Rose, MD, MPH,² Kim Gaudreau¹

ABSTRACT

This paper outlines the results of an assessment respecting the extent of Canadian Institutes of Health Research (CIHR) funding in population health intervention research from 2001 to 2006. The analysis is presented within the context of the barriers and enablers to the generation, support for and uptake of population health intervention research. Given data quality concerns, the assessment should only be considered as an estimate of CIHR funding in this area. Eight percent of applications received in all CIHR competitions were in population health intervention research, of which 22% were funded over the period in question. The results show that the number and success of these applications tend to vary across peer review committees and among different types of funding competitions. To address identified gaps, the authors highlight several collaborative opportunities under way that are aimed at better support for population health intervention research in Canada.

Key words: Funding; public health; intervention studies

La traduction du résumé se trouve à la fin de l'article.

Can J Public Health 2009;100(1):115-119.

This paper outlines the results of an assessment to determine the extent to which population-level and community-level intervention research is being supported through the Canadian Institutes of Health Research (CIHR) over a five-year period. It situates this analysis in the context of a review of existing barriers and opportunities in the generation and use of population health intervention research and its support. In response to the assessment results, the paper highlights CIHR and partners' efforts to ensure that current population health interventions unfolding across Canada include embedded research components to rigorously assess which interventions work, how they work and how they can be improved. Finally, this paper calls for leadership from multiple actors to systematically learn from existing and emerging policies and programs, and to apply this knowledge to improve the health of populations.

The problem

Interest in evidence-informed decision-making related to population health has been growing in Canada and across the globe. To this end, research must move beyond the mere description of health problems towards the identification of effective solutions appropriate to different contexts. It must also explore how the policy and program interventions shaping the social and physical environments in which we work, live, play and learn can be improved and become supportive of health. Population health intervention research efforts are uniquely positioned to contribute to this dynamic evidence base. Such research examines how population health outcomes are affected by the social, cultural, economic and/or environmental factors that are in play when a program or policy is initiated, changed, institutionalized or ended (see the article by Hawe and Potvin in this issue).

Despite high demand for the evidence that population health intervention research can provide, syntheses of global evidence reveal limited research output in this area. For example, the United Kingdom Health Development Agency¹ conducted a review of

major bibliographic sources, research and systematic reviews of public health intervention research by health and social science organizations. For bibliographic sources, no more than 4% of the research output was considered public health intervention research. Output from research organizations revealed that between less than 0.1% and 6.1% of research over the previous five years was of relevant application to the public health topics outlined in the Healthier Nation report.¹ The authors postulated that capacity to conduct intervention research was not well developed. Other possible explanatory factors were the lack of infrastructure to coordinate this kind of research; the complexities related to the study of macro- and micro-level interventions and the challenges of inferring cause and effect relationships from such initiatives; the debate concerning what constitutes actual evidence; and the political impetus for disseminating high profile, shorter-term effects at the expense of focusing on longer-term outcomes. Proposed solutions included the development of a framework to guide intervention-oriented research in this area; the creation of incentives within university systems to promote such research; the establishment of infrastructure to coordinate the efforts of relevant agencies; and the establishment of high-quality standards of evidence.¹ Other assessments have also identified low levels of investment in related areas. For example, a review by the National Cancer Research Institute² revealed that less than 2% of cancer research is invested in prevention. Furthermore, just 0.4% of biomedical research publications in the UK were of relevance to public health program and policy planning.²

The need for more population health intervention research has also emerged as a priority in Canada. Stakeholder consultations

Author Affiliations

1. Canadian Institutes of Health Research, Institute of Population and Public Health
2. Canadian Institutes of Health Research, Institute of Nutrition, Metabolism and Diabetes

Correspondence and reprint requests: Erica Di Ruggiero, Canadian Institutes of Health Research, Room 97, 160 Elgin Street, Address locator: 4809A, Ottawa, ON K1A 0W9, E-mail: e.diruggiero@utoronto.ca

undertaken in 2001-02 by the CIHR Institute of Population and Public Health (CIHR-IPPH)* and the Canadian Population Health Initiative† to determine the priorities for population and public health research and knowledge translation underscored the need to assess population-level impacts of interventions.³ They further highlighted the need for standards of evidence specific to population and public health to better recognize the many research designs, in addition to randomized controlled trials, used to evaluate intervention effectiveness (i.e., ecological, observational, quasi-experimental and time-series designs). Establishing these standards would acknowledge the complexities specific to population health intervention research and allow what limited evidence exists in this area (particularly evidence applicable to Canadian settings) to be more effectively assessed and applied.⁴ Despite CIHR-IPPH's efforts since 2002, a recently completed evaluation noted the dearth of population health intervention research being funded in Canada and recommended that CIHR-IPPH place even greater emphasis on this area.⁵

Improving the quality and availability of population health intervention evidence will require engagement of government and non-governmental organizations, research funding agencies and the broader research, policy and practice communities.

METHODS

To better understand current CIHR funding for population health intervention research, an assessment was conducted to determine the extent to which population-level and community-level intervention research was being supported through CIHR's open and strategic competitions. The open competition (or investigator-initiated research) accounts for the majority of CIHR funding available as operating grants, salary and training awards, and so on. In this instance, researchers develop proposals and submit applications. Strategic competitions are developed by Institutes to address major health priorities and requests for applications to respond to these specific needs. As such, some of these competitions have directly encouraged applications in population health intervention research. For more information about CIHR and its Institutes, please see <http://www.cihr.ca>.

An operational definition of population-level and community-level interventions was developed to guide the validation of search results. For the purpose of this study, "Population-level and community-level interventions are intended to shift the risk of entire populations or communities by focusing on community/society-level factors (individual, social, cultural, economic and/or environmental and their interactions), which account for the distribution of risk in a society. Rather than only targeting individuals most at risk, interventions include both policies and programs intended to protect, promote and/or improve the health of people" (definition developed by the CIHR-IPPH, unpublished).

At the time the study was first designed, the term "population-level intervention research" was employed. With the advent of the Population Health Intervention Research Initiative for Canada, a definition for population health intervention research was created. Both terms are thus used in the context of this paper. Eligible research proposals included all those received in response to open and strategic CIHR competitions over the 2001-2002 to 2005-2006 time period.

All funded, fundable (meaning that they received a peer-review score of 3.5 or above but did not get funded because of resource constraints) and non-funded applications were included in the analysis to show application pressure. Fundable (but not funded) applications were counted as not funded for the purposes of this analysis.

Specifically, a search of the CIHR funding database for fiscal years 2001-2002 to 2005-2006 was performed using a series of key words (e.g., quasi-experimental design; quazi-experimental design; devis quasi-expérimental; observational study; étude par observation; intervention; community trial; essai communautaire). Key words were used to search the project title, key word field or lay abstract, when available. Applications that named clinical, health systems/services or biomedical as the primary theme were excluded, whereas applications naming theme 4 (the CIHR so-called "pillar 4", concerned with the socio-behavioural and environmental determinants of health) were included, irrespective of which Institute(s) was also named and deemed relevant by applicants. A trial run was performed using certain key words such as "randomized" or "natural experiment", which yielded a significant number of false-positive as well as false-negative results (i.e., the key word did not exist in the funding database). On the basis of these preliminary findings, applications that included the word "randomized" in the project title or key word field were excluded. The intent was not to exclude randomized controlled trial studies entirely but, rather, to minimize false-positive and false-negative results. This search parameter did not preclude root words (i.e., random), from which projects like cluster randomized trials would be picked up through the use of such a search strategy. The trial run also helped to determine which peer review committees had received applications in the area of population health intervention research in an effort to focus the search on committees most likely to receive such applications.

Because of limitations in the CIHR classification system, a number of false-positive results were obtained through the key word searches. Limitations included the lack of a consistent category for research on primary prevention and randomized controlled trials with clinical outcomes (i.e., in health care settings), leading to incorrect classification of some projects as theme 4 research by applicants. Subsequent data validation proved difficult because of the incomplete availability of information on many of the research projects (i.e., key words not provided by the researcher or project abstract not available). Therefore, this assessment should be considered only an estimate of CIHR funding of population health intervention research over the time period under study. Given these data quality concerns, the authors felt that further statistical analyses would otherwise overstate the significance of the findings and that the data were not robust enough to support further breakdown of the findings (fundable vs. funded, topic areas of interest, etc.) Therefore, only the raw data are presented.

For each table, the overall success rate (percentage of total applications funded) was calculated by dividing the total number of applications funded by the total number of applications received. The percentage of applications received in population health intervention research was calculated as the total number of these applications divided by the total number of applications received. Finally, the percentage of population health intervention research applications funded was calculated as the total number of these funded applications divided by the total number of population health intervention research applications received.

* one of 13 Institutes within CIHR

† a part of the Canadian Institute for Health Information

Table 1. Funding Rates of Population Health Intervention Research in All CIHR Grants Programs, 2001-2006

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	Overall
1. Total no. of applications received	310	434	405	324	399	1872
2. Total no. of applications funded	114	110	93	85	99	501
Overall success rate (2./1.)	37%	25%	23%	26%	25%	27%
3. Total no. of population health intervention research applications received	10	32	30	35	34	141
Proportion of population health intervention research applications received (3./1.)	3%	7%	7%	11%	9%	8%
4. Total no. of population health intervention research applications funded	3	10	6	7	5	31
Proportion of population health intervention research applications funded (4./3.)	30%	31%	20%	20%	15%	22%

Table 2. Funding Rates of Population Health Intervention Research in CIHR Open Competition Grants Programs, 2001-2006

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	Overall
1. Total no. of applications received	227	232	229	241	315	1244
2. Total no. of applications funded	82	55	32	65	75	309
Overall success rate (2./1.)	36%	24%	14%	27%	24%	25%
3. Total no. of population health intervention research applications received	6	13	25	18	17	79
Proportion of population health intervention research applications received (3./1.)	3%	6%	11%	7%	5%	6%
4. Total no. of population health intervention applications funded	1	2	2	2	2	9
Proportion of population health intervention research applications funded (4./3.)	17%	15%	8%	11%	12%	11%

Table 3. Cumulative Funding Rates of Population Health Intervention Research in CIHR Open Competition Grants Programs by Relevant Peer Review Committee, 2001-2006

Peer Review Committee	1. Total No. of Applications Received	2. Total No. of Applications Funded	Overall Success Rate (2./1.)	3. Total No. of Population Health Intervention Research Applications Received	Proportion of Applications Received in Population Health Intervention Research (3./1.)	4. Total No. of Population Health Intervention Research Applications Funded	Proportion of Population Health Intervention Research Applications Funded (4./3.)
Aboriginal Peoples' Health	38	9	24%	17	45%	2	12%
Behavioural Sciences	139	38	27%	3	2%	0	0%
Children's Health	263	64	24%	26	10%	5	19%
CIHR Team Grants	13	5	38%	1	8%	0	0%
Gender, Sex and Health	31	6	19%	2	6%	1	50%
Health Information and Promotion Research	107	33	31%	6	6%	1	17%
Movement and Exercise	33	8	24%	1	3%	0	0%
Nutrition, Food and Health	175	48	27%	7	4%	0	0%
Psychosocial, Sociocultural and Behavioural Determinants of Health	279	60	22%	8	3%	0	0%
Public, Community and Population Health	166	38	23%	8	5%	0	0%
Total	1244	309	25%	79	6%	9	11%

RESULTS

Table 1 summarizes overall CIHR funding in population health intervention research for both open and strategic competitions. Population health intervention research applications constituted 8% (141/1872) of the total number of applications received and, of these, 22% (31/141) were funded.

Table 2 presents the results from analysis of applications received and funded through CIHR's open competition. Population health intervention research applications made up 6% (79/1244) of the total applications received and, of these, 11% (9/79) were funded.

Table 3 presents open competition results broken down by peer review committees. There is considerable variability in the proportion of population health intervention research applications received by each committee, as well as in the proportion of these that are funded. As well, the small numbers make drawing conclusions from these data difficult. For more information on the CIHR

peer review committee mandates, please visit the CIHR website at: <http://www.cihr.ca/e/4657.html> (Accessed December 2008).

Table 4 presents results from applications received and funded through strategic funding initiatives, some of which did encourage population health intervention research applications. Population health intervention research applications constituted 14% (88/628) of the total applications received and, of these, 25% (22/88) were funded.

DISCUSSION

The analysis revealed that population health intervention research is being funded by CIHR (Table 1). However, the number and success of these applications appear to vary across peer review committees (Table 3) and between the open and strategic funding competitions (see Tables 2 and 4). It is of note that the analysis showed higher application pressure and success rates generally

Table 4. Funding Rates of Population Health Intervention Research in CIHR Strategic Competition Grants Programs, 2001-2006

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	Overall
1. Total no. of applications received	83	202	176	83	84	628
2. Total no. of applications funded	32	55	61	20	24	192
Overall success rate (2./1.)	39%	27%	35%	24%	29%	31%
3. Total no. of population health intervention research applications received	4	19	31	17	17	88
Proportion of applications received in population health intervention research (3./1.)	5%	9%	18%	20%	20%	14%
4. Total no. of population health intervention research applications funded	2	8	4	5	3	22
Proportion of population health intervention research applications funded (4./3.)	50%	42%	13%	29%	18%	25%

occurring for population health intervention research applications under strategic initiatives.

Low numbers of applications in population health intervention research and variable funding rates may be explained in part by insufficient research capacity and application quality. These could result from a historical lack of funding targeting this area and, until recently, limited graduate and postgraduate education opportunities for acquiring and maintaining these skills. To enhance the quantity and quality of population health intervention research applications received, CIHR must consider capacity gaps among Canadian researchers in the methods, tools and content expertise unique to population health intervention research.

Population health intervention research seeks to account for the role of socio-political and cultural context on the impact achieved by population-level program or policy changes. Therefore, it requires different methodologies, such as econometric designs, than may otherwise be used in traditional epidemiologic and behavioural science studies. The variability in the numbers of applications received and the success rates across peer review committees merit further exploration to ensure that peer reviewers have relevant capacity and expertise in these methodologies to appropriately assess population health intervention research applications.

How funding mechanisms are structured may also affect the number and success of population health intervention research applications. For example, research funds cannot, understandably, be used for delivering programs or policies. Population health intervention researchers often must look to initiatives unfolding outside of their control as opportunities for study. However, standard funding timelines for researchers are usually much more protracted. As a result, researchers rarely have time to apply for and receive funding before the policy or program changes they want to study have already occurred. Even if funding is awarded in a timely manner, this divide between research and implementation funding is cumbersome to manage. New partnership models, such as coordinated parallel funding for research and program/policy implementation and interactive Web-enabled mechanisms to connect researchers with fleeting policy and program opportunities for research, are crucial for further development of this area.

Differences between the funding streams within CIHR (open and strategic funding) may also affect the analysis findings. The analysis showed that the overall success rates of population health intervention research applications were relatively higher within the strategic Institute-specific funding competitions (Table 4) compared with open competitions (Table 2). These differences may reflect, in part, the focus of selected strategic initiatives on population health

intervention research. However, this finding deserves further assessment.

While the analysis presented has several limitations, it highlights that opportunities exist for CIHR to better support population health intervention research in Canada. These include bolstering research capacity as well as ensuring that peer review and other structural features of funding streams are designed to respond to the methods and content unique to population health intervention research.

Current efforts at CIHR to better facilitate population health intervention research

Canada's premier health research funding agency, the CIHR, recognizes that strengthening population health intervention research falls squarely within its mandate: "To excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products and a strengthened Canadian health care system."⁶

Multiple Institutes across CIHR are working to support researcher engagement in studying interventions at population and community levels and to address some of the identified barriers. Of CIHR's 13 Institutes, the Institute of Nutrition, Metabolism and Diabetes (CIHR-INMD) and the IPPH are providing particular leadership in population health intervention research by collaborating across sectors to build capacity and create new funding opportunities. For example, CIHR-INMD developed "Canada on the Move", an online physical activity research project involving population health intervention researchers, health promotion and disease prevention practitioners, policy-makers and the private sector.⁷ This collaborative effort generated new knowledge, established effective partnerships across sectors and highlighted the strong demand for innovative research tools that support the creation and use of population health intervention research.

More recently, CIHR-INMD partnered with other Institutes, health-related non-governmental organizations and a federal government department to create the Operating Grant on Intervention Research (Healthy Living and Chronic Disease Prevention).⁸ This funding opportunity includes a more flexible structure to enhance the timeliness of the peer review process. It also encourages collaboration with practitioners and policy-makers implementing the projects/policies under study. Thus, it provides funding to researchers more promptly than traditional mechanisms and promotes the production of research knowledge explicitly for use by those in the field.

CIHR-IPPH has also spearheaded many innovative initiatives in this area, including its role as the Secretariat for the Population

Health Intervention Research Initiative for Canada (PHIRIC) and through several of its funding programs. For example, CIHR-IPPH's Centres for Research Development program has enabled the creation of interdisciplinary research and knowledge exchange environments, actively involved policy-makers and other research users, and supported the development of intervention research studies that address the impacts of physical or social environments on health.

CIHR is responding to the recommendations of its international review, such as the need to strengthen population health intervention research and to reform the peer review system. Some of the resulting changes may have a positive impact on its ability to further facilitate population health intervention research. In addition, CIHR's involvement in PHIRIC and the efforts described below may also encourage development in this area.

Public health capacity development efforts

Masters of Public Health programs and more recently Schools of Public Health highlight universities' strong response to the need for improved public health capacity. The CIHR-IPPH and the Public Health Agency of Canada's Office of Public Health Practice are committed to complementing these efforts and have already implemented several capacity-building initiatives. These include the following: 1) Professional Masters of Public Health Program, an awards program that supports the current and next generation of public health policy-makers and practitioners. It builds capacity for effective knowledge translation and use of research evidence by the public health system; 2) Doctoral and Post-Doctoral Research Awards, a program that supports the next generation of public health researchers and stimulates research relevant to public health policy and practice across the country. Funding has been provided through this program for doctoral research awards and post-doctoral research awards, including an emphasis on intervention research; 3) Applied Public Health Chairs Program, which supports public health faculty in Canada in order to bolster national capacity for effective intervention research, mentoring, education and application of research evidence of relevance to the public health system.

In addition, several Institutes across CIHR have offered research program development grants to support research teams and their stakeholders in developing programs of intervention research; as well, they provide pilot project grants to develop methods and tools and demonstrate feasibility. Such initiatives are now ripe for multi-year operational funding of intervention studies. Examples include the Interdisciplinary Capacity Enhancement Teams focused on Health Disparities⁹ and New Emerging Teams on the Study of Obesity and Healthy Body Weights.¹⁰ Many of the seven Centres for Research Development funded by CIHR-IPPH have an explicit focus on strengthening the evidentiary base for effective population-level and community-level interventions by creating interdisciplinary research environments in which research relevant to practice can be encouraged.¹¹

CONCLUSION

Canada has a unique opportunity to respond to the demand for more high-quality evidence on the impact of policy and program interventions and thereby advance this important research agenda through capacity building, infrastructure development and collabora-

tive arrangements. As Canada's premier health research funding agency, CIHR can play a significant role in collaboration with other organizations in supporting population health intervention research in Canada. Analysis of CIHR funding reveals that population health intervention research is being funded at CIHR. However, opportunities clearly exist for CIHR to increase the quality and quantity of this type of research and improve the capacity of Canadian researchers to undertake such work. To this end, several CIHR Institutes are actively working to create innovative and collaborative funding opportunities dedicated to supporting more and better population health intervention research.

REFERENCES

1. Millward LM, Kelly MP, Nutbeam D. *Public Health Intervention Research – The Evidence*. London, UK: UK Health Development Agency, 2003.
2. Public Health Sciences: Challenges and Opportunities. Report of the Public Health Sciences Working Group Convened by the Wellcome Trust. London: Wellcome Trust, 2004.
3. Canadian Population Health Initiative, Institute of Population and Public Health, Canadian Institutes of Health Research. Charting the Course: A Pan-Canadian Consultation on Population and Public Health Priorities. Ottawa, ON: Canadian Institute for Health Information, 2002. Available online at: http://www.cihr.ca/e/pdf_14039.htm (Accessed August 4, 2006).
4. Mid-Term Evaluation of the Institute of Population and Public Health. Ottawa, ON: Canadian Institutes of Health Research, 2005. Available online at: <http://www.cihr-irsc.gc.ca/e/31060.html> (Accessed on August 4, 2006).
5. Kiefer L, Frank J, Di Ruggiero E, Dobbins M, Manuel D, Gully P, et al. Fostering evidence-based decision-making in Canada: Examining the need for a Canadian population and public health evidence centre and research network. *Can J Public Health* 2005;96:11-119.
6. Canadian Institutes of Health Research. Who We Are. Available online at: <http://www.cihr-irsc.gc.ca/e/7155.html> (Accessed August 4, 2006).
7. Canada on the Move. *Can J Public Health* 2006;97(Suppl 1). Available online at: <http://www.journal.cpha.ca/index.php/cjph/issue/new/252> (Accessed December 8, 2008).
8. Canadian Institutes of Health Research. Operating Grant in Intervention Research (Healthy Living and Chronic Disease Prevention). Available online at: http://www.researchnet-recherchenet.ca/rnr16/viewOpportunityDetails.do?prog=399&view_search&terms=intervention+research&org=CIHR&type=AND&resultCount=25 (Accessed December 9, 2008).
9. Canadian Institutes of Health Research. Interdisciplinary Capacity Enhancement Grants – Reducing Health Disparities and Promoting Equity for Vulnerable Populations. Available online at: <http://www.cihr-irsc.gc.ca/e/25703.html> (Accessed August 4, 2006).
10. Institute of Nutrition, Metabolism and Diabetes, Canadian Institutes of Health Research. Excellence, Innovation and Advancement in the Study of Obesity and Healthy Body Weight – New Emerging Team (NET) Grants. Available online at: <http://www.cihr-irsc.gc.ca/e/4293.html> (Accessed August 4, 2006).
11. Institute of Population and Public Health, Canadian Institutes of Health Research. CIHR Centres for Research Development Corner. Available online at: <http://www.cihr-irsc.gc.ca/e/30949.html> (Accessed August 4, 2006).

RÉSUMÉ

Nous présentons les résultats d'une analyse de l'étendue du financement accordé par les Instituts de recherche en santé du Canada (IRSC) à la recherche interventionnelle en santé des populations de 2001 à 2006. Cette analyse tient compte des facteurs qui limitent ou, au contraire, qui habilitent la production, le soutien et l'utilisation de la recherche interventionnelle en santé des populations. Comme il existe des lacunes dans la qualité des données, notre analyse doit être considérée comme une simple estimation du financement de l'IRSC dans ce domaine. Huit p. cent des demandes reçues aux concours des IRSC étaient dans le domaine de la recherche interventionnelle en santé des populations, et 22 % de ces demandes ont été financées au cours de la période de référence. Le nombre et l'acceptation des demandes ont tendance à varier d'un comité d'évaluation par les pairs à l'autre et selon le type de concours de financement. Pour combler ces lacunes, nous décrivons plusieurs projets de concertation en cours qui visent à mieux appuyer la recherche interventionnelle en santé des populations au Canada.

Mots clés : financement; santé publique; études interventionnelles