This article presents the main findings of a descriptive study inventorying public health research in Québec funded by provincial and federal government bodies between 1999 and 2004. The database was created specifically for this project from the Banque de la recherche sociale et en santé (Health and Social Research Databank) of the Québec Ministry of Health and Social Services, using a frame of reference to demarcate and categorize research in public health.

The results reveal that public health research projects accounted for 13.6% of all projects in the aforementioned database, and were mainly concentrated in the research categories Population Health and Wellness and their Determinants (État de santé et de bien-être de la population et ses déterminants) (59.9% of public health projects) and Social Development, Adjustment and Integration (Développement, adaptation et intégration sociale) (44.9% of public health projects). The provincial government funded a higher percentage of projects (59%), but with the exception of scholarships and fellowships, the federal government funded a higher dollar amount. Overall, funding allotted to research in public health was lower than that for other types of research in health and social sciences inventoried in the database.

This first inventory of public health research in Québec provides a means of estimating the volume of research devoted to this field and funding directed to it in comparison with other fields of research in health and social sciences. It also raises questions on the orientation, organization and funding of research in public health.

Key words: Public health; public health research; inventory; portrait; state of public health research

METHODS AND ANALYSES

The development of the frame of reference was based on the PNSP and the Swedish study.1,6 It included a definition of public health research, inclusion and exclusion criteria, and a classification table (see Table I) based on the research categories of the Swedish study and the Québec Public Health Program priority areas. The classi-

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Acknowledgments: This research project was conducted thanks to the financial support of the Public Health Directorate (Direction générale de la santé publique – DGSP) and the Strategic Planning, Assessment and Quality Directorate (Direction générale de la planification stratégique, de l’évaluation et de la qualité – DGPSEQ) of the Ministry of Health and Social Services of Québec (ministère de la Santé et des Services sociaux du Québec – MSSS) and the Québec Institute of Public Health (Institut national de la santé publique du Québec – INSPQ). The project also benefited from the support and expertise of an advisory committee consisting of Lyne Jobin (DGSP), Julie Cauthier (DGSP), Marie-Christine Lamarche (DGSP) and Pierre Joubert (INSPQ), who made a substantial contribution to the design of the project and preparation of the article. The authors would also like to thank Philippe-André Coutu, Research Agent (MSSS) and Nathalie Gravel, Research Technician (INSPQ), who collaborated in the construction of the database, Denis Hamel (INSPQ), who consulted on the statistical analyses, Karlyne Guilbeault (INSPQ), who did the layout of the article in its French version, and James Lawler, who translated/adapted the article into English.
### TABLE I


<table>
<thead>
<tr>
<th>Research Category</th>
<th>Criteria for Inclusion</th>
</tr>
</thead>
</table>
| 1. Population Health and Wellness and their Determinants                           | • Research related to monitoring the health and wellness of the population (incidence, prevalence and distribution of morbidity and mortality in the population, risk and protective factors).  
• Research (descriptive, analytical, explanatory, etc.) on the associations between health and wellness in the population and their possible determinants. |
| 2. Promotion, Prevention and Protection Programs and Interventions                 | • Research (evaluative, participative, action-oriented, etc.) on projects (including pilot and demonstration ones) designed to maintain, protect and improve the health and wellness of people in certain groups, geographic zones or communities.  
• Evaluative research on the development, implementation, deployment, effects, efficiency, effectiveness and cost/benefit of promotion, prevention and protection programs and interventions (including screening and early prevention). |
| 3. Organization of Health and Social Services Related to Public Health             | • Research (evaluative, descriptive, etc.) on the organization and/or the functioning of services and their impact on the health of populations (e.g., prevention, front-line, screening, or specialized services such as those of public health laboratories) from a population perspective.  
• Research on the provision (delivery) and use of services, their performance and quality, from a population health perspective.  
• Research on whether services match the needs of the population, on the attitudes of the population or group under study (e.g., service users, workers) with regard to the services, on communication between service providers and users from a population health perspective. |
| 4. Public Policy Related to Population Health and Wellness                         | • Research on the elements of provincial, regional and local policies related to the health and wellness of the population, inside and outside the provincial health and social services network (e.g., policies to fight poverty, policies on social and/or sustainable development).  
• Research assessing the impact of public policies and approaches to risk management (e.g., legislation, regulations).  
• Research on attitudes and perceptions of the population with regard to public policies and risk management.  
• Research on underlying values and on the ethical dimension of public health practices (e.g., equality in health). |
| 5. Theories and Methods Related to Public Health Management, etc.                  | • Theories on etiology, behaviour, social relations, systems, interventions, ecology, change management, etc.  
• Methodology for analyzing the health and wellness of the population, methods of risk assessment, mathematical modeling, etc. |

**Québec Public Health Program Priority Area (2003-2012)**

<table>
<thead>
<tr>
<th>Priority Area</th>
<th>Criteria for Inclusion</th>
</tr>
</thead>
</table>
| 1. Social Development, Adjustment and Integration                               | • Research on integrated services and preventive clinical practices in perinatal care and early childhood.  
• Research on comprehensive, coordinated interventions in schools.  
• Research on the prevention of social maladjustment and mental health problems in adults.  
• Research on preventing the loss of autonomy among the elderly. |
| 2. Lifestyle Habits and Chronic Diseases                                         | • Research on the promotion of healthy lifestyle habits and the prevention of chronic diseases, including health education, preventive clinical practices (e.g., screening), changing the physical or social environment (e.g., impact of more bicycle paths or availability of healthier diet choices), and the application of public policies that foster health.  
• Research on preventive dental care. |
| 3. Non-Intentional Trauma                                                         | • Research on the promotion of wearing safety gear and safe workplace environments, and on the strengthening of laws and regulations governing drivers, including those of off-road vehicles.  
• Research on the prevention of trauma in the home.  
• Research on the promotion and implementation of regulations fostering safety in leisure and sports activities. |
| 4. Infectious Diseases                                                            | • Research on vaccination against preventable diseases (immunization).  
• Research on the application of guidelines for investigating cases, preventing further cases of, and controlling outbreaks of diseases.  
• Research on the screening and prevention of sexually- and blood-transmitted diseases.  
• Research on the prevention of other infectious diseases (e.g., nosocomial infections, tuberculosis, etc.). |
| 5. Environmental Health                                                          | • Research on the promotion of ways of improving internal and external air quality.  
• Research on the prevention of certain diseases that have an environmental origin.  
• Research on health surveillance, epidemiological surveys and the implementation of appropriate control measures in cases of threats to the environment.  
• Research on the prevention and management of environmental risks. |
| 6. Workplace Health                                                               | • Research on activities in the mandate that links the Québec Ministry of Health and Social Services (Ministère de la Santé et des Services sociaux – MSSS) and the Québec Workplace Health and Safety Board (Commission de la santé et de la sécurité du travail – CSST).  
• Research on claims made to the Workplace Health and Safety Board (toxic contamination, poisoning, cancer, hearing loss).  
• Research on promotion and prevention in the workplace with regard to lifestyle habits and chronic diseases, and research on social adjustment. |
| 7. General Population Health                                                      | • Research on population health from a public health perspective but that does not exclusively relate to any of the six priority areas outlined in the Québec Public Health Program 2003-2012 (Programme national de santé publique – PNSP). |
The database was constituted from: 1) the Banque de la recherche sociale et en santé (BRSS) (Health and Social Research Databank) of the ministère de la Santé et des Services sociaux (MSSS) (Ministry of Health and Social Services of Québec), and 2) from the pool of provincial projects funded by the Programme de subventions en santé publique (PSSP) (Public Health Grants Program). The BRSS has a high level of reliability because data entry is centralized and it is regularly updated. All research projects in the BRSS that received funding between 1999 and 2004 were selected for the study, then classified by title. When a project could not be classified by title, the abstract, if available, was read along with other BRSS descriptors. A category entitled “Excluded for lack of information” was created to differentiate projects whose categorization into public health could not be established because of lack of information. To test the accuracy of the coding procedure, coding was done twice (by separate researchers) on 10% of the data, with a 95% match rate. In addition, consistency of categorization was tested and data were cleaned up repeatedly. Figure 1 illustrates the steps taken to construct the database.

To analyze the public health research projects, simple frequency distributions and bivariate analyses were conducted based on certain BRSS descriptors. A comparison with other projects in the database was also done. Although this study is purely descriptive, chi-square tests were conducted and revealed that all the differences in proportions were statistically significant because of the large number of units in the database.

**FINDINGS**

Of the 11,072 health and social research projects listed in the database, 1,508 (13.6%) belonged to the field of public health. These were unequally distributed among the research categories and Québec Public Health Program priority areas; 80% were related to one research category, and 97% to one public health priority area. The research category Population Health and Wellness and their Determinants and the priority area Social Development, Adjustment and Integration accounted for the largest number of projects. However, the research category Organization of Services and the Québec Public Health Program priority area Lifestyle Habits and Chronic Diseases had the highest mean amounts of funding per project (Table II). The mean duration of population health projects was 27 months, versus 32 months for other types of projects in the database.

Total funding allocated to research in public health (including that for scholarships, research fellowships and research grants) comprised 12.3% of funding provided for health and social research projects listed in the database. The mean amount of funding directed to public health research was lower than that given to other projects in the database, with only 16% receiving funding higher than $200,000 (versus 21% for other types of research). The mean dollar amount of grants in public health research was less than that given to other research in social...
The low frequency of research concentrated on more than one priority area. We can ask ourselves whether the framework for funding public health research should be adjusted to primarily encourage and support research sectors that are less developed, projects encompassing several research categories and priority areas, and the creation of teams of researchers to focus on public health priorities.

TABLE III
Comparison of Volumes of Public Health Research (Numbers and Amounts) with Those of Other Projects in the Database, by Type of Funding (Scholarships/Fellowships and Research Grants)

<table>
<thead>
<tr>
<th>Type of Funding</th>
<th>Public Health Projects</th>
<th>Other Projects in the Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number and percentage – Scholarships/fellowships</td>
<td>371</td>
<td>2743</td>
</tr>
<tr>
<td>Number and percentage – Research grants</td>
<td>1032</td>
<td>9036</td>
</tr>
<tr>
<td>Number and percentage – Funded projects</td>
<td>1403</td>
<td>558</td>
</tr>
<tr>
<td>Number of projects with no funding data</td>
<td>105</td>
<td>6.90</td>
</tr>
<tr>
<td>Total amount and percentage of funding – Scholarships/Fellowships</td>
<td>$24,675,011</td>
<td>$169,292,965</td>
</tr>
<tr>
<td>Total amount and percentage of funding – Research grants</td>
<td>$169,508,527</td>
<td>$1,217,201,742</td>
</tr>
<tr>
<td>Total amount – Funded projects</td>
<td>194,383,539</td>
<td>1,386,494,707</td>
</tr>
<tr>
<td>Mean amount – Scholarships/fellowships</td>
<td>$67,049</td>
<td>$16,718</td>
</tr>
<tr>
<td>Mean amount – Research grants</td>
<td>$164,252</td>
<td>$194,348</td>
</tr>
<tr>
<td>Mean amount – Funded projects</td>
<td>$138,548</td>
<td>$153,952</td>
</tr>
<tr>
<td>Median – Funded projects</td>
<td>$69,720</td>
<td>$71,392</td>
</tr>
</tbody>
</table>

TABLE IV
Comparison of the Distribution of Funding Allocated to Public Health Research with That Given to Other Projects in the Database, by Type and Source of Funding

<table>
<thead>
<tr>
<th>Source of Funding</th>
<th>Public Health Projects</th>
<th>Other Projects in the Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of Funding</td>
<td>Research Grants %</td>
<td>Scholarships/Fellowships %</td>
</tr>
<tr>
<td>Quebec</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRSQ</td>
<td>4.5</td>
<td>48.1</td>
</tr>
<tr>
<td>CQRS-FQRSC</td>
<td>13.7</td>
<td>32.7</td>
</tr>
<tr>
<td>PSSP</td>
<td>2.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Other</td>
<td>8.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Subtotal – Quebec</td>
<td>29.6</td>
<td>82.2</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIHR*</td>
<td>49.2</td>
<td>11.5</td>
</tr>
<tr>
<td>SSHRC</td>
<td>8.5</td>
<td>4.9</td>
</tr>
<tr>
<td>Other</td>
<td>12.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Subtotal – Canada</td>
<td>70.4</td>
<td>17.8</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Canadian Institutes of Health Research

Finally, there were 998 principal investigators in public health, of whom 82% conducted their research in universities with faculties of medicine. However, public health research was not solely conducted in universities, since 28% of organizations conducting such research were part of the Québec government health and social services network.

DISCUSSION

In general, between 1999 and 2004, funding of public health research in Québec seemed to be lower than that of other fields in health and social research inventoried in the database. The low frequency of research projects worth more than $200,000 and a shorter mean duration of projects suggests that there were few large-scale research projects in public health. However, Québec provincial investment in scholarships and fellowships appears to make a significant contribution to the development of research, and it would seem important to maintain this level of support.

Compared to what was observed in Sweden, less research focused on Population Health and Wellness and more on Promotion, Prevention and Protection Programs and Interventions in Québec. Furthermore, certain research categories that are very relevant for the development of public health research received little coverage, namely Theories/Methods and Health Policy/Health Care System and Services. Certain Québec Public Health Program priority areas such as Environmental Health and Trauma also received little coverage. Moreover, there was a relatively low percentage of projects that concentrated on more than one research category or Québec government priority area. We can ask ourselves whether the framework for funding public health research should be adjusted to primarily encourage and support research sectors that are less developed, projects encompassing several research categories and priority areas, and the creation of teams of researchers to focus on public health priorities.
Indeed, the findings suggest that there has been a structural effect of government policies on the strategic orientations of funding bodies and the development of research in Québec. The promulgation of health priorities by the government of Québec in 1992 in the Policy on Health and Wellness (Politique de la santé et du bien-être du Québec) and the translation of these into research priorities by Québec funding bodies possibly resulted in an increase in research on Promotion, Prevention and Protection Programs and Interventions and on Social Development, Adjustment and Integration. The activities of researchers in universities with no faculty of medicine and the substantial participation of the Québec health and social services network in managing research illustrate the diversity of contributions to research in public health.

This inventory of research has certain limits. On the one hand, it is a partial study because it does not take into account all research conducted in public health (i.e., research not receiving grants, sponsored by the private sector, or funded by international and foreign organizations), dimensions related to the organization of research in this field (creation of research teams/groups/networks, distribution of projects and funding by type of research infrastructure and/or discipline of the researchers) or the productivity of researchers. On the other hand, the demarcation between public health and the wider field of health and social services was blurred for certain research subjects such as organization of services, social integration or rehabilitation.

**CONCLUSION**

Despite its limits, this initial portrait of public health research in Québec is but a first step which, it is hoped, will stimulate further interest in the progress of research in this field, both in Québec and across Canada. We can envisage a number of positive impacts of this study, such as the availability of a database and a frame of reference which can help us gain a better understanding of the contours of public health research in the province of Québec.

Although the number of public health research projects is likely under-estimated, given the limits of the database and the conservative choices made in applying inclusion criteria, this inventory provides a means of comparing research in public health with that in other fields of health and social research. Disparities appear to be mainly related to the structural framework of funding – organizations with large budgets for grants provided less support for public health research projects compared to other fields of research.

At a time when public health tends to be better integrated into the health and social services system, at least in Québec, this study confirms the advantage of having a coherent inventory of public health research to inform its development and funding.

This exercise could be repeated periodically in order to monitor trends in public health research and fluctuations related to funding. Further research could be conducted to complete this current portrait by analyzing non-subsidized or sponsored research, the organization and impact of public health research and/or the productivity of researchers. It would also be pertinent to subdivide certain categories that present a large volume of research, such as Population Health and Wellness and their Determinants or Social Development, Adjustment and Integration, in order to refine and provide more in-depth analysis of research in these areas. Finally, systematic planning in public health research could facilitate matching research activities to long-term government priorities and those of funding organizations.

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Received: October 30, 2007
Accepted: April 15, 2008.