Creating A Sustainable Health Research Industry

A Proposal To Leverage Health Care Assets In Northern Ontario

Contents

Economic Development and Diversification, and Quality Job Creation Through Investing in a Northern and Rural Health Research Strategy

According to the Canadian Institutes of Health Research (CIHR), it is estimated that Canada will need 100,000 new health researchers by 2010. This is an opportunity for Northern Ontario. The North has significant health research activity to build upon (please see Appendix II), and its attractiveness as a location for health research will only be enhanced with the establishment of Canada's newest medical school, which will have its own research program. There is an opportunity for northern municipalities and health research stakeholders to capitalize on this growing critical mass with a commercially-oriented health research initiative that complements, supports and benefits all partners.

In 2004, the Northern Medical School will admit its charter class. This will be the first medical school in Canada to have an exclusive focus on northern and rural medical education. The establishment of the Northern Medical School provides a new opportunity to attract and retain the human resources necessary to a focused, Northern Ontario health research strategy.

It is proposed that provincial and municipal government partners, with the participation and support of northern health research stakeholders, fund a comprehensive study of Northern Ontario's health research opportunity. Such a study would help northern health research stakeholders to identify the strategies and mechanisms that will optimize benefits for all.

According to the Canadian Institutes of Health Research, it is estimated that Canada will need 100,000 new health researchers by 2010.

Study Objectives

- Document existing health research activities in Northern Ontario, including pockets of strength within the region's five major municipalities
- Consult with northern health research stakeholders on needs, objectives and priorities
- Assess the impact of the Northern Medical School on health research opportunities in Northern Ontario
- Assess the environment for health research
- Define a research agenda that best fits the environment, stakeholder interests and intentions and the opportunity
- Develop a strategy and business plan for accelerating health research activity in Northern Ontario for the next decade

This opportunity is particularly well-timed. The field of health research is undergoing rapid expansion, driven by advances in medical science and significant increases in the levels of private and public sector investment (please see Appendix III for an overview of the health research opportunity in Canada today). Moreover, northern and rural health research is quickly emerging as a major priority in Canada. Success in growing a specialized health research program in the North could provide significant economic development and diversification benefits, including quality job creation.

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Potential Benefits to Northern Ontario

- Opportunity to build upon existing health research strengths and a growing research infrastructure (including the creation of the Northern Medical School and the development of teaching hospitals across the region) to create well-paying employment in the knowledge-based economy
- Opportunity to create a substantial number of support jobs for each health researcher
- Opportunity to create employment that would help to stem youth out-migration, including full-time, attractive positions for students with undergraduate degrees
- Opportunity to occupy a significant niche within a national rural and northern health research program
- Opportunity to capitalize upon significant and increasingly outsourced R&D investments made by the pharmaceutical and biopharmaceutical industries to create jobs in Northern Ontario
- Opportunity to develop an environment that could attract manufacturers to Northern Ontario to commercialize research results through new product development
- Opportunity to contribute to improved health and health services for rural and northern populations
- Opportunity to augment Northern Ontario educational programs as the health research industry expands
- Opportunity to benefit many communities, regardless of geographic location, as a pan-Northern Ontario initiative, although some infrastructure concentration would likely be appropriate in the model
- Opportunity for synergy with the Government of Ontario's planned tax incentive zones for Northern Ontario
- Opportunity to use the health research strategy and business plan as a template for new research and knowledge-based strategies in other sectors of the Northern Ontario economy, such as information technology, forestry and mining

In 2000, 37 percent of the $396.2 million spent on R&D in Ontario by pharmaceutical companies was outsourced; $20.4 million went to universities, $40.9 million to hospitals, and $85.8 million to others, including individuals, organizations such as private clinics and governments.

Developing a Health Research Strategy

To develop an effective strategy to grow the health research sector in Northern Ontario, one must identify the best fit between the interests, resources and capabilities of project stakeholders and existing and emerging opportunities locally, provincially, nationally and globally. In addition, the optimal mechanisms for implementation needed to transform a vision into results must be created. This will be the focus of the project consultants. As noted below, there is an emerging national strategy for northern and rural health research that could be especially significant for Northern Ontario. The federal government is also stepping up its investments in health research very aggressively. However, there are equally compelling opportunities funded by the private sector, especially pharmaceutical firms. The Neureka Research Corporation in Sudbury, for one, has demonstrated that a Northern Ontario biomedical research firm can count major pharmaceutical companies among its clients and sustain global partnerships to develop innovative new products. A strategy will transform all of the information in this proposal into knowledge, creating a basis for action as well as an action plan.

The Medipolis Health Care Business and Science Park in Oulu, a city in northern Finland, population 120, 750, accommodates some 47 companies, most involved in the development and manufacture of health care products such as: pharmaceuticals and novel drugs; medical devices and equipment; diagnostic kits and reagents; health care software; telemedicine and other applications of information technology for internal markets. Over 90 percent of the medical equipment and more than 80 percent of the pharmaceuticals, therapeutics and diagnostic tests manufactured in Finland are exported.

The goal of the proposed consortium is to make Northern Ontario into a centre of excellence for northern and rural health research.

The ongoing development of the Canadian Institutes of Health Research (CIHR) national strategy for rural and northern health research as one of the Institutes' first major cross-cutting themes may provide significant funding opportunities for Northern Ontario health researchers. One-third of Canadians live in rural areas. In comparison to their urban counterparts, they are relatively disadvantaged in the areas of population health status and health services. Recognizing that health is a major contributor to community sustainability, CIHR is developing a strategy to advance health research relevant to rural and northern areas (please see Appendix IV to review excerpts from the draft strategy).

"It is recommended that CIHR spearhead the development of a linked set of rural health research units with specialized expertise that capitalizes upon existing research centres."

-CIHR Strategic Initiative in Rural and Northern Health Research

To date, this includes a multi-disciplinary menu of rural research topics involving all 13 of the CIHR institutes. Proposed niche areas include: health policy, service innovations, health promotion and primary health care, telehealth, occupational health, health human resources development, aging and rural life, rural palliative care, mental health services, and outreach rehabilitation. When implemented, this strategy promises to increase the opportunities for research in northern and rural areas.

The Northern Ontario health research community can place itself at a competitive advantage through recruiting scientists and creating research themes that are consistent with funding opportunities. It is therefore imperative that an analysis of key research themes be completed and incorporated into a medical research model.

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Planning a Health Research Industry for Northern Ontario: Proposed Methodology

1. Opportunity Analysis

- Inventory of current research activity and research resources in Northern Ontario
- Identify strengths within Northern Ontario's five major municipalities
- Consultation with stakeholders
- Research other centres of medical research
- Identify models for organizing and conducting research (see Appendix I)
- Foci/niches for a Northern Ontario research enterprise
- Potential size of opportunities
- Potential economic impacts
- Sustainability/funding opportunities

2. Facilitating Selection of Collaborative Research Structures/Arrangements

- Prepare discussion document
- Conduct initial one-off soundings re proposed model(s)
- Visioning process
- Articulate overall strategy/structures/directions
- Set broad research objectives

3. Business Plan/Implementation Plan

- Roles of any 'new' research organization(s)
- Co-ordination mechanisms/shared resources/linkages
- Business partnerships
- Operating/capital financial plans
- Organization requirements-governance and management
- Leadership/HR requirements
- Facility and infrastructure requirements
- Funding/fundraising
- Implementation plan/staging/timing

Project Partnerships

The Implementation Management Committee of the Northern Medical School, an incorporated, not-for-profit organization, is spearheading the proposed strategy on behalf of a proposed consortium of northern municipalities and health research stakeholders. Resolutions and/or letters of support for this project are appended to this proposal.

Health Research Strategy Preliminary Project Partners

Municipal

Federation of Northern Ontario Municipalities

City of North Bay

City of Sault Ste. Marie

City of Greater Sudbury

City of Thunder Bay

Northwest Ontario Municipal Association

City of Timmins

Health Research Stakeholders

Laurentian University

Lakehead University

Northeastern Ontario Regional Cancer Centre

Neureka Research Corporation

Northwestern Ontario Regional Cancer Centre

Sudbury Regional Hospital

Thunder Bay Regional Hospital

Northeast Mental Health Centre

Proposed Consortium Reporting Structure

Northern Ontario Health Research Advisory Committee

A northern advisory committee representing the consortium of Northern Ontario municipalities and health research stakeholders formed for this project will be the governing body for the study. The twelve to eighteen members of the northern advisory committee will be responsible for monitoring the progress of the consultants and ensuring the timely completion of the study.

External Advisory Committee

An expert panel composed of scientists, chief executive officers and research institute personnel will be created to critically appraise the feasibility and business and implementation plan. The six to seven representatives on this panel will be chosen from across Canada based on their expertise. The expert panel will be responsible to the Northern Ontario Health Research Advisory Committee and will stipulate that members must be available to attend two to three meetings during the development of the business plan.

Proposed Study Budget

It is estimated that the total cost of the study will be $600,000, and proposed that it be funded according to the following formula:

Northern Ontario Heritage Fund Corporation	$500,000
Municipalities and health research stakeholders (To include cash and services-in-kind)	$100,000

Proposed Study Timing

It is estimated that the timeframe for study completion will be six months from the date of project approval.

Appendix I

Overview of Potential Medical Research Models

The study will review various medical research models that have been successful in forging research initiatives in health science, such as:

- The institute of medical research model, which aims to advance the knowledge of health and diseases on multiple fronts
- The medical and business research facility model, which consists of a biotechnological service unit that helps companies to develop rapidly and successfully, reducing the initial investments required by providing access to state-of-the-art space and equipment.
- The regional life science greenhouses model, which draws upon a funding allocation to support a regional life science research program. It aims to speed medical and life-science research from university laboratories to commercial use. Although researchers normally work in their own laboratories, a greenhouse may also provide assistance with space acquisition, as well as seed funding.

Institutes of Medical Research: Examples

John P. Robarts Research Institute, London, Ontario

- Key discoveries in stroke and atherosclerosis, ALS and other neurological diseases, spinal cord injury, diabetes, transplantation and immunology, medical imaging, clinical trials
- Canada's only privately directed medical facility; receives no operating funds from government
- After 15 years, employs 440 people, including 48 scientists, 170 trainees, 182 research associates and 40 support staff
- Business Development Office negotiates agreements with companies interested in commercializing Institute's technologies
- Recent ventures include XL Resonance Partners (2001), specializing in manufacturing and clinical trial services in the area of MR imaging, and Diabetogen Biosciences Inc. (2000), a company developing proprietary therapeutics for autoimmune disease
- Affiliated with London Health Sciences Centre and the University of Western Ontario
- Major capital expansion underway ($26 million)

Ottawa Health Research Institute

- Formed through merger of the Loeb Health Research Institute and the Ottawa Hospital Research Institute in April 2001
- Closely allied with University of Ottawa Faculty of Medicine and Faculty of Health Sciences
- Some 720 employees, including 110 scientists
- Some $30 million in external funding (up from $1 million annually in predecessor institutes in 1988)
- Annual budget of $52 million
- Each junior scientist employs six to seven people, while a senior scientist employs 12 to 15.
- Intellectual property is owned by the OHRI; however, a generous cost-sharing formula is in place for patents that are registered by scientists
- Submits 300 to 400 grant applications annually on behalf of scientists and scientific groups to the Canadian Foundation for Innovation, the Ontario Innovation Trust, the Ontario Research and Development Challenge Fund, the Ontario Research Performance Fund and the CIHR Research Overhead Fund

Medical and Business Research Facilities: Examples

London Biotechnology Commercialization Centre, London, Ontario

- Adjacent to the University of Western Ontario, the John P. Robarts Research Institute and London Health Sciences
- Three-storey, 51,000-square-foot building providing wet and dry labs, office and administrative space to pre-commercial life sciences companies with proprietary technology in such fields as drug development, therapeutics and medical devices
- Provides hands-on operational assistance with company creation

Medipolis Health Care Business and Science Park

- Founded in 1990 and opened in 1992 in Oulu, a city in northern Finland, population 120,750
- Part of The Technopolis PLC Group, which includes more than 200 high-technology companies
- Located adjacent to University of Oulu's Biocenter, Faculty of Medicine and Hospital
- Accommodates some 47 companies, most involved in the development and manufacture of health care products such as: pharmaceuticals and novel drugs; medical devices and equipment; diagnostic kits and reagents; health care software; and telemedicine and other applications of information technology for international markets
- Combines companies' resources and acts as a bridge between companies and research institutes
- Focused on global markets
- Speeds up the commercialization of new technologies and innovations
- Over 90 per cent of the medical equipment and more than 80 per cent of the pharmaceuticals, therapeutics and diagnostic tests manufactured in Finland are exported.

BC Research Inc., University of British Columbia Campus

- Former BC Research Corporation (provincial government), privatized in 1993 with a new mandate to become a profitable centre for technology innovation
- Employs 85 staff with a mix of technical and commercial skills, mostly scientists, engineers and patent specialists
- Launched Silvagen Inc., its first high-technology company, in 1997 and went on to develop a trademarked Technology Integrator business model; has now launched two stable spin-off companies
- Maintains three business units: Technologies, Contract Sciences and Facilities

Regional Life Science Greenhouses: Example

State of Pennsylvania Life Science Greenhouses

The State of Pennsylvania has committed $100 million for the development of three regional life science greenhouses as a means of speeding medical and life-science research from university laboratories to commercial use. The Pittsburgh Life Sciences Greenhouse, for example, is a partnership of Carnegie Mellon, the University of Pittsburgh, the region's biotechnology industry, economic development organizations, and state and local governments. It serves as a catalyst for the region's life sciences sector, linking bioscience researchers and entrepreneurs, and improving their access to funding, leading-edge laboratories and equipment, and market opportunities. Researchers working with greenhouse programs typically work from their own labs.

Once federal and foundation funds have been expended, greenhouses fund research opportunities that have the potential to become businesses or products that can be licensed by other companies. This model replicates the success of the Pittsburgh Digital Greenhouse, a consortium of universities and private companies that supports the computer-chip industry in Pittsburgh. The new life-sciences and biotechnology programs generated as a result of the new funds are expected to create 4,400 jobs, attract or create 100 biotechnology companies, and leverage more than $150 million U.S. in private investments over the next five years. Currently in Pennsylvania there are more than 350 life-science companies that employ in excess of 50,000 workers. In addition, more than $775 million in federally funded life-sciences research is conducted at Pennsylvania's colleges and universities annually. In particular, the University City Science Center, a consortium of 30 academic and scientific institutions in Philadelphia, has helped to launch nearly 250 companies over the last three decades, including life-sciences companies.

Other:

The Alberta Heritage Foundation for Medical Research

The Alberta Heritage Foundation for Medical Research was created in 1980 with a $300 million endowment from the province's Heritage Trust Fund. It has since contributed more than $650 million to the scientific community and has a budget of $70 million for 2002. This funding supports more than 200 senior researchers and 350 researchers-in-training working in such areas as heart attack therapy, islet transplantation for diabetics, nerve regeneration, the cell biology of cancer, etc. The foundation has helped to create a supportive environment for research in Alberta, attracting top scientists to the province. For each dollar it invests, researchers attract at least two additional dollars in external funding from public and industry sources. The profits from innovations are shared by the researcher, the company that commercializes the innovation (increasingly located in Alberta) and the host university.

Appendix II

Overview of Health Research Activities in Northern Ontario

Northerners have a solid foundation to build upon in health research. Groundbreaking research has been conducted through the two regional cancer centres and their affiliated hospitals, the Centre for Rural and Northern Health Research based at Lakehead and Laurentian University and the Neureka Research Corporation in Sudbury. It is estimated that Lakehead and Laurentian universities and their hospital and cancer centre partners are currently managing research projects totalling $10 million per year. A strong research program is planned for the Northern Medical School, focusing on the health issues of northern and rural populations.

The goal of the proposed consortium is to make Northern Ontario into a centre of excellence for northern and rural health research. A concerted effort is being undertaken to move the research agenda to a new level of national and international profile, ranging from biomedical, environmental and occupational health research to health care systems and applied clinical research. Northern Ontario has already established a strong track record in research, for example:

- Neureka Research Corporation, a three-year-old biotechnology organization based in Sudbury, has signed contracts worth $4 million and currently conducts approximately $1 million annually in clinical research trials for global pharmaceutical firms and health care organizations. In February, Neureka announced an agreement with the University of Turku in Finland to develop and manufacture a diagnostic kit that will detect coronary disease in patients based on modified cholesterol levels. The kit will have a potential market share of $10 million U.S. annually. Neureka provides the Canadian and global markets with unique products and services in the areas of life science, health care and environmental biotechnology. The corporation's client list includes Glaxo SmithKline, Bayer Inc., Searle Canada, Procter & Gamble Pharmaceuticals, Hoechst Marion Roussel, Astra Pharma Inc., Knoll Pharma Inc., Bristol-Myers Squibb, National Institute of Health (N.I.H.), US Department of Veterans Affairs, Friends Research Institute Inc., The Hospital for Sick Children, Toronto, Laurentian University, University of Guelph, Clinical Research Institute of Montreal and the Vietnam Institute of Biotechnology (VinaBiotech Ltd.)

- The Chair in Cancer Research is a partnership that was established in 1999 by the Northeastern Ontario Regional Cancer Centre (NEORCC), Laurentian University (LU) and the Sudbury Regional Hospital (HRSRH) to further develop their cancer research efforts. This strategic alliance is supported by a $1.5 million grant of operating funds from the Ontario Research Development Challenge Fund (ORDCF). The Chair in Cancer Research Program has gained a strong national and international reputation as a leader in biomolecular sciences. This includes studies to evaluate the roles of HIV-Tat protein in monocyte function, and the G1/S checkpoint, the S-phase damage-sensing pathway and protein kinase C and cellular growth control. The Chair in Cancer Research program is now focused on translational research, particularly in the area of human breast cancer. In addition, a Ph.D. program will be established in biomolecular science under the lead of the Chair. The Chair has attracted over $2.9 million in peer-reviewed research funding since 2000, when the Chair was appointed, with a further $1.2 million in grant applications pending. A strategic infrastructure expansion for this program is scheduled to enter the first phase of construction this summer with doubling of wet lab and office space at NEORCC followed by a second phase of renovation at LU. The Chair in Cancer Research project and its associated infrastructure will play a complementary role to the Northern Medical School. It will aid in the goal of increasing the level of medical training aimed at rural and northern practice by providing access to the highest level of biomolecular training for students interested the medical field. The recent approval of a Chair in Biomolecular Science and the anticipated approval of a Chair in Medicinal Chemistry at LU are examples of strong cross-links between disciplines that will ensure that research remains relevant and translatable into clinical applications and that infrastructure use is optimized. Access to the expertise and knowledge of current and future faculty of the Chair in Cancer Research will be an important aspect of both medical and research training locally. The existence of the state-of-the-art research infrastructure in the region will have the added benefit of attracting and retaining top quality cancer specialists and researchers. Development of the Chair in Cancer Research initiative is a critical step in the vision of a broader medical research institute.

- Investigators in North Bay are focused on genome research on economically important blood sucking Diptera.

- Lakehead University has a strong research record in biomolecular sciences, including the study of histone deacetylases and cell cycle control in hela cells, and structural regulation of histone H1 binding to chromatin in living cells.

- Together, Lakehead and Laurentian University are partners in the Northern Health Information Program (NHIP), which furnishes extensive health data related to northern health issues

- At the Northwestern Ontario Regional Cancer Centre, researchers are seeking to understand the mistakes in cancer cells in the hope of repairing, reversing or taking advantage of these mistakes to improve cancer treatment success. This work entails comparing healthy cells with malignant ones at a molecular level, to see why the malignant cells are the way they are using advanced technologies for the manipulation and analysis of DNA, RNA and proteins. In January 2002, the Northwestern Ontario Regional Cancer Centre and Lakehead University unveiled plans to establish a new Cancer Research Institute in Thunder Bay by December 2003. The Northwestern Ontario Cancer Research Institute will be an independent health research facility committed to excellence in basic, clinical and applied research that contributes to the understanding and treatment of cancer.

- The Northeastern Ontario Regional Cancer Centre (NEORCC) in a short period of time has established a strong reputation for excellence in research. Its researchers have been highly successful in competing nationally for research funds; many also now sit as full members of grants review panels for national funding agencies such as the Canadian Institutes of Health Research and the National Cancer Institute of Canada. Two of NEORCC's researchers are also recent recipients of Premier's Research Excellence awards. NEORCC was the first centre worldwide to offer stem cell transplantation for metastatic breast cancer patients in an outpatient setting. Since then, its tumour biology researchers have made major inroads towards understanding how tumour cells resist killing by chemotherapy or radiation and why tumour cells grow in the body unchecked. Other members of its research program are examining whether workplace exposures to certain agents contribute to cancer incidence or mortality. NEORCC is also investigating new approaches to improve targeting of tumours by radiation, to better understand psychosocial issues in patients with cancer, and to improve health care access and delivery. The Centre also leads or participates in a variety of clinical trials related to cancer. Since the establishment of the Chair in Cancer Research Initiative and the new Northern Medical School, NEORCC, Laurentian University, and the Sudbury Regional Hospital have been working together to double existing cancer research infrastructure and personnel and to establish a Ph.D. program in Biomolecular Science at Laurentian University. This will help service an ever-increasing demand for training in these areas by local students and ensure retention of highly-trained personnel locally. The long-term goal will be the establishment of a medical research institute at the Northern Medical School supported by existing, highly successful research programs and infrastructure.

- Teaching physicians working through the Northwestern Ontario Medical Programme and Northeastern Ontario Medical Education Corporation have laid the groundwork for the establishment of research strength in applied clinical research

- The Public Health Research, Education and Development Program (PHRED), based on a partnership between Laurentian University and the Sudbury and District Health Unit, is undertaking a joint education and research initiative in the field of Public Health.

- The Centre for Rural and Northern Health Research (CRaNHR) / Centre de recherche en santé dans les milieux ruraux et du nord (CRSRN) is an academic and applied research centre with sites at Laurentian University and Lakehead University in Thunder Bay, Ontario. CRaNHR's mandate is to conduct interdisciplinary research on rural health and the health workforce with a view to improving health services, access to health care, particularly in rural and northern communities, and enhancing our understanding of the health care system.

- Northeast Mental Health Centre is promoting and encouraging the development of research in mental health and addictions, both individually and through joint ventures.

Appendix III

Health Research in Canada: an Overview of Opportunities

- According to the Canadian Institutes of Health Research, it is estimated that Canada will need 100,000 new health researchers by 2010.
- The federal government has made a commitment to increase its funding of health research to $1 billion annually by 2006
- The federal government's health research agency, Canadian Institutes of Health Research (CIHR), has identified rural health research as a major theme cutting across all 13 of its virtual institutes (please see Appendix IV)
- Since 1997, the Government of Ontario, recognizing the importance of research to our future prosperity, has committed $1.8 billion to the Ontario Research and Development Challenge Fund and the Ontario Innovation Trust. Other measures include:
    - The Premier's Research Excellence Awards, $75 million over ten years, announced in the Ontario Budget of 1998 and increased to $10 million per year in the 2000 Budget
    - The Graduate Scholarships in Science and Technology Program, $75 million over ten years, also announced in the 1998 Ontario Budget
    - Numerous tax incentives introduced since 1997 to foster R&D
    - The establishment of the $30 million Ontario Research Performance Fund in 2000, increased by $2 million annually in the 2002 budget
    - The establishment of a biotechnology secretariat and task force
    - The $161 million renewal for five years of the Ontario Centres of Excellence program in the 2002 budget
    - The launch of a $51 million biotechnology strategy in June 2002, including a $30 million Biotechnology Cluster Innovation Program to provide grants to develop regional innovation plans and support the development of commercialization centres, research parks and innovation networks in regions across Ontario.
    - According to the Ontario Health Research Alliance, the Ontario Government spends some $44 million on health-related R&D annually, representing 19 per cent of an estimated total R&D expenditure of $227 million
    - The new Ontario Cancer Research Network will provide $50 million over the next four years to accelerate research on promising new cancer therapies

- Canada's pharmaceutical firms outsource a significant proportion of their research and development programs to Canadian hospitals, universities, research institutes and government laboratories across the country
    - From 1988 to 2000, annual pharmaceutical R&D expenditures in Ontario increased by 454 per cent, from $71.5 million to $396.2 million
    - In 2000, 37 per cent of the $396.2 million spent on R&D in Ontario by pharmaceutical companies was outsourced; $20.4 million went to universities, $40.9 million to hospitals, and $85.8 million to others, including individuals, organizations such as private clinics and governments
- Canada is a global leader in the biopharmaceutical industry, one of the world's fastest-growing industries, second only to the U.S. in the number of firms in this sector; more than 90 per cent of the advanced biotechnology products on the world market are health-related

Appendix IV

CIHR Strategic Initiative in Rural and Northern Health Research

(The following excerpts from a November 2001 submission to the CIHR Governing Council by Renée F. Lyons, Special Advisor to the President of CIHR and Professor, Dalhousie University and Paula Gardner, CIHR Research Assistant and Graduate Student, Dalhousie University, provide an indication of potential future directions for northern and rural medical research in Canada).

Vision:

To apply bold, new approaches to health research and rural health research that will build on the strengths of rural culture and rural communities to make health a major benefit of rural living.

Strategies:

1. Rural Health Research Shops: A Centre-Focused Research and Development Awards Program

It is recommended that CIHR spearhead the development of a linked set of rural health research units with specialized expertise that capitalizes upon existing research centres. Niche areas will include: health policy, service innovations, health promotion/primary health care, telehealth, occupational health, health human resource development, aging and rural life, rural palliative care, mental health services and outreach rehabilitation, etc. These research units will follow the European science shops model, in which university research centres are increasingly accessible to communities and policy-makers to help address key rural health issues. For example, several recent studies of cancer and cardio-vascular disease outcome show substantive disadvantages for rural residents; however, many of the prevention and treatment factors are modifiable through uptake of best practice guidelines. Often special techniques need to be developed to communicate research findings with rural health professionals and to apply findings in non-urban settings. A linked set of research centres can provide a valuable conduit to communities on best practices. Communities can consult on health issues, and seek advice and support in developing projects or developing policy. The Rural Health Research Shops will develop research training opportunities for students and faculty through collaborative research projects and training programs/internships. This initiative will be a linked incentives research program with 25-50% funding matched with CIHR Institutes, government, or NGO's (See NIH's P30 - Core Centre Grants). Although no funds are provided for direct support of major research projects, a centre grant helps to integrate and promote research in existing projects. Grants would be awarded competitively for up to five years. This support is intended to enhance the productivity of research grants at the institution and thereby improve the research capability of the community and the health of people in rural communities. The applicants can be an institution or consortium of institutions. Proposals must include one or more rural community partners.

2. Community Alliances for Health Research: Rural and Northern

Modelled on CIHR's Community Alliances for Health Research (CAHR) and SSHRC's Community-University Research Alliances (CURA), this initiative will build partnerships between community groups and university researchers by defining a research and training agenda of mutual interest. Co-Directors must be a university and a community partner. Rather than focusing initially on multiple collaborations, this initiative focuses on a solid partnership between a few groups and builds collaboration from there. A strong knowledge translation component/policy component of national significance must comprise the collaboration. An international partnership is encouraged. This initiative provides a research program that seriously encourages university-community partnerships and supports the concept of the science shop around specific research ventures.

3. RuralNet

The RuralNet initiative calls for the development of linkages among researchers in Canada and other countries, and strengthens knowledge translation with the public, practitioners and policymakers in Canada.

a. Linking Researchers Development of a fund to support national and international research network development, including hosting a World Forum on Rural Health Research within the next 3 years. This fund would support bringing the best minds to Canada and to reach out to other countries with efforts such as international research roundtables (researchers meet to exchange research strategies and to collaborate on rural health policy issues).

b. Linking Research with Policy and Action Effective knowledge translation is an essential component for all research. It may be particularly important, however, for rural health research and this area provides a useful pilot for CIHR's knowledge translation secretariat. An interactive web-based demonstration project on rural health research knowledge translation (the CIHR eportal project) is proposed, including research findings, synthesis work, current research underway, a rural health researcher data base, and links to Canadian and international sites (using the Aboriginal website in Australia as a model.) These initiatives dramatically improve research capacity development, and the dissemination and translation of research, including policy makers, to the benefit of rural communities. They connect Canadians intimately to the health research enterprise of CIHR.

Building international leadership through national excellence in health research

Research Training and Career Development

Given that Canada is the second largest country in the world with significant differences in rates of mortality and morbidity in rural and urban communities, Canada needs to foster a new generation of researchers that can address salient rural and northern health research questions across the four pillars. The proposed Rural Health Post-Doctoral Awards Program contributes to addressing this need.

Goals:

- Expedite recruitment of rural health researchers and health researchers interested in increasing the impact of their work in rural communities or interested in using the unique characteristics of rural populations for research (e.g., genetics, aging, water quality).
- Increase opportunities for clinician-scientists and research training in rural communities

4. Rural Health Post-Doctoral Awards Program

Paramount to the goal of increasing capacity is the facilitation of an academic culture that supports rural research. The development of a rural health focus through post doctoral training in established health research centres will facilitate the recruitment of both rural health researchers as well as health researchers interested in increasing the impact of their work in rural communities or interested in using the unique characteristics of rural populations or communities for research (e.g., genetics, aging, water quality). One or more Centres could propose a linked Rural Health post-doctoral position wherein the student supervision is shared between the two institutions, fostering collaboration across large and small universities. These post-doctoral positions might include a research residency in a rural community. This initiative increases the capacity (skill sets/numbers) of Canadians to conduct research to improve health status and health services in rural communities.

Building a strong foundation for rural and northern health in Canada and within CIHR

In contrast to the United States and Australia, Canada does not have a long and substantive tradition in rural development, rural health or rural health research. Consequently, Canada has been to slow to adopt innovations in rural health systems. There is growing evidence of a rural health "crisis" and recognition that Canada must show stronger leadership in this area.

Together with recent national and provincial attention to rural Canada, there is a need to create a mechanism within CIHR that develops and manages a coherent, national strategy in rural health research. This initiative proposes the establishment of a secretariat that can foster rural health research development, knowledge translation, partnership development and funding opportunities.

Goals:

- Provide an integrated approach to rural health research and knowledge translation
- Identify and act on a research issue of national concern that resonates with all Canadians
- Deliver partnerships to Institutes and provide incentives for partnering
- Assist the 13 Institutes to include rural (focus, methods, knowledge translation) in their strategic plans.
- Establish a solid financial foundation for rural and northern health research

Appendix A

Research Foci

A content analysis of the CIHR Rural Health Menu and St. John's Forum results indicated the following three major themes: Understanding and Improving the Health Status of RuralPopulations, Redesigning Health Systems that Work for Rural and Northern Communities, and Making Efficient and Effective Use of Health Human Resources in Rural Canada.

1. Understanding and Improving the Health Status of Rural Populations

Research that provides a clear picture of the health status of rural Canadians is critically important to planning and decision-making at all levels. What are the consequences of health status for rural communities? Which determinants of health are the most significant predictors of health outcomes in rural areas? What are the health beliefs of rural Canadians and how do these beliefs affect health? Particular attention should be paid to health determinants research that examines issues of the environment, transportation, job/income, and the personal health practices of rural Canadians over the lifespan.

Components

- Health status of rural populations and its determinants, including prevalence rates and mortality/morbidity changes over time; e.g., asthma and allergies, disability and functioning, Aboriginal people's health, nutritional status, diabetes mellitus, renal disease, hepatitis, distribution of musculoskeletal conditions, rural elders
- The positive aspects of rural living
- Environmental factors including: food, water and air safety, environmental toxins and living situations (sewer systems, housing) and their impact on health, and environmental determinants of health and illness; e.g., musculoskeletal health, arthritis, skin conditions, dental health
- Policies and practices that impact health; e.g., access to good food
- Health-related practices (e.g., early infant feeding)
- Strategies to address the special demands of weather and terrain on service delivery and design (mobility equipment, carrying supplies, food storage)
- Collective solutions to serving needs; e.g., rural elders
- The costs of obtaining health care and of engaging in health-related behaviors in rural communities (e.g., dental care, eye care and hearing resources)
- Gender inequalities and health in rural areas
- The effect of rural living on health and development; e.g. children and adolescents
- Rural and northern work environments and health status

2. Redesigning Health Systems that Work for Rural and Northern Communities

Bold, new approaches to the health system in its broadest sense are required to improve service. Issues such as healthcare quality and access to service from prevention to community care, occupational health and safety and telehealth require particular attention. Appropriate benchmarks for service delivery in rural areas must be developed. Monitoring of service and uptake of innovation require examination. What do rural residents do when they get sick? How do rural communities mobilize resources to deal with illness, to keep healthy? How are outcomes confounded by service deprivation? Access to health services will never mirror communities with large concentrations of people; therefore, promotion and prevention initiatives must be substantive components of health service.

Components

- Research and policy uptake for alternative delivery strategies: traditional Aboriginal medicine; tele-health; outreach services (e.g., rehabilitation, diabetes services)
- Best practices in primary care, prevention and health promotion (maternal health and pregnancy, tobacco control, nutrition and obesity, injury prevention, physical activity (inclusive - older adults)
- Benchmarks, outcomes and performance indicators of health
- Youth health (prevention/health promotion)
- Rural work environments and their hazards to health (circulatory and respiratory conditions) - Quantifying understanding, preventing and treating occupational disease and risks.
- Optimal strategies (effective, efficient, acceptable) in rural communities for prevention, screening, diagnosis and treatment/management of conditions such as the following: STD's, HIV, AIDS, hepatitis, rabies, mental health and addictive and compulsive behaviors, workplace, home and recreational injuries, breast cancer, FAS, colorectal cancer, prostate cancer, diabetes, disability, TB and respiratory infections, post transplantation monitoring, chemotherapy school based care, mental health and illness services
- Supportive and community care (e.g., palliative care)
- Specific barriers to quality care (e.g., liver disease) - health care providers, counseling and support, access to lab facilities, access to specific procedures, access to inpatient or outpatient facilities.
- Dealing with the relation between distance and early, appropriate interventions

- Access to health information for rural-dwellers (cancer prevention, screening, opportunities to participate in clinical trials, treatment options, supportive and palliative care)
- Improved access to health services for marginalized groups in rural communities
- Tele-health - what infrastructure availability and support in rural and remote communities is necessary for "e-health"?
- The infrastructure support required for health service (e.g., transportation, housing, recreation facilities)

3. Making Efficient and Effective Use of Health Human Resources

Of particular importance in rural areas are training and the availability (recruitment/ retention) of health-related human resources. What training and community conditions support rural health service and attract the human resources needed to sustain rural communities and improve health outcomes?

Components

- Increased access to health professionals, including specialist services
- Recruitment and retention of health professionals
- Models of health care resource utilization and effects on costs and treatment outcomes
- The conditions in rural communities that motivate health professions to live and work there
- Access to information/ best practices by rural health care workers
- Development of specific skill sets for rural populations and specific health conditions
- Public expectations of health professions and human resource distribution
- The evolving role of informal and voluntary care
- Lack of housing and other infrastructure gaps in northern areas for health professionals
- The effect of professional practice (boundaries of service) guidelines on health service availability and quality