Report on Funds Available for Research in Rehabilitation (2000-2010)

Rapport sur le financement de la recherche en réadaptation (2000-2010)

Requested by:
À la demande du :

The Quebec Provincial Research Network In Rehabilitation (REPAR)
Réseau Provincial de Recherche en Adaptation-Réadaptation (REPAR)

Respectfully submitted,

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Carol L. Richards, O.C., Ph.D., *D.U*. P.T., F.C.A.H.S

Quebec, June 28, 2013

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[1] In this document, we will refer to the FRSQ although it was replaced by the *Fonds de recherche du Québec – Santé (FRQS)* in 2011.

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Mandate given to Dr. Carol L. Richards

In 2009, the REPAR (Quebec Provincial Rehabilitation Network) conducted an important review of its activities to serve as a guide for the development of the next 4-year research plan. This review identified funding for rehabilitation research as a potential barrier to future developments, in part because of a poor understanding of the funding possibilities, the flow of research funds in the past ten years and the perceived lack of sufficient funds and low success rates.

To inform the REPAR and its partners of the state of funding for research activities in the field of rehabilitation, it was decided to form a task group to do an environmental scan and to write a report on the state of rehabilitation funding. Dr. Carol L. Richards accepted to act as chairperson for this task group and was given a free hand in the creation of an Advisory Committee and the methodology.

The mandate

To form a task group composed of leaders in the field of research in rehabilitation and social integration that will fulfill the three following objectives:

a. Carry out a comparative analysis "benchmarking" of research in the field and to report on research funds available to finance such research in order to better determine the possibilities for financing and synergistic partnerships to meet the challenges raised by the 2009 REPAR review;
b. Establish the most effective strategies (e.g. provincial and federal partnerships) to augment funding resources for research in rehabilitation and social integration;
c. Propose an action plan to interest and engage various organizations (partners) to participate in the research funding.

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Le mandat

Confier à un groupe de travail, composé des principaux leaders de la recherche en adaptation-réadaptation, les mandats de :

a. faire une analyse comparative (« benchmarking ») de la recherche dans le domaine et de dresser un bilan des programmes des sources actuelles de financement, afin de déterminer les possibilités de financement et de synergie en réponse aux enjeux soulevés lors des États généraux 2009;
b. établir les stratégies les plus efficaces (ex. partenariats provinciaux et nationaux), en vue d'accroitre le financement de la recherche en adaptation-réadaptation;
c. formuler un plan d'action visant à intéresser diverses organisations à participer à ce financement.

Methodology

1. Creation of an Advisory Committee

Well-known and active researchers representing the four major Universities in the Province of Quebec with Rehabilitation Programs in Occupational and Physiotherapy, the Province of Ontario, the CIHR and the United States, accepted Dr Richards' invitation to work on this mandate.

1.1 Mandate of the Advisory Committee

The mandate of the Advisory Committee was:

- To guide the extent of the environmental scan;
- To discuss the results of the scan and
- To propose ways to augment the funds available for research in rehabilitation and social integration to meet future challenges
- To discuss an action plan to optimize research funds in rehabilitation and social integration.

1.2 Meetings of the Advisory Committee

The Quebec members of the Advisory Council met twice by means of teleconference calls. Other members interacted with Dr Richards in person or by e-mail. All members of the Advisory Committee were invited to attend a meeting in Quebec City on November 1st, 2011. At this meeting, a draft report prepared by Dr Richards provided the canvas for discussion. Prior to the meeting, all members had received a copy of the draft report. The draft report was modified following the group discussion and each member was provided with a revised version for suggestions and corrections before the final version was prepared.

1.3 Scope of the environmental scan

Given the collaborative nature of research endeavours across provincial and even national borders, it was decided not to limit the environmental scan to the Province of Quebec but to also include federal funding programs and the main provincial funding sources from other Canadian provinces.

1.4 Members of the Advisory Committee

Designated Holder of the mandate from REPAR

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2. Requesting information from granting agencies, foundations, research centers and University Programs in Rehabilitation

The information on research funds available for studentships, post-doctoral awards and funds for research projects was obtained over a 2 -year period. Dr Richards or a member of the Advisory Committee either met representatives of the funding sources in person or contacted them by e-mail or by telephone. In addition, Dr Richards attended a day on research funding organized within the context of the American Neurorehabilitation Congress held in Montreal on October 20th, 2010. This provided her with the opportunity to learn about the organization of funding sources in the United States. She also met with members of the REPAR Board of Directors and representatives of REPAR's funding partners in Dec. 2010 where she presented her information gathering plan in order to meet the objectives of her mandate. At this meeting she was informed of a Registry of research funds kept by the Ministry of Health and Social Services of the province of Quebec. Dr Richards was also invited to speak to the members of the International Advisory Board of the Institute of Musculoskeletal Health and Arthritis (IMHA), one of the 13 Institutes of the CIHR, by its Scientific Director, Dr Jane Aubin in November, 2010.

A first draft of the report was sent to all members of the Advisory Board and representatives of the contributing granting agencies in October 2011. A meeting of the Advisory Board was held on November 1st 2011. Following discussions held during this meeting, it was decided to return to the Ministry of Health and Social Services of Quebec and CIHR to request completion of the data up to the end of 2010. Also, it was decided to request information from SHERC and NSERC given the ever-expanding research activities in the social and engineering-oriented aspects of rehabilitation. The need for information on the number of researchers involved over the years was also recognized and it was recommended to request information from the granting agencies and Universities on the evolution of the number of researchers applying for funds.

Second and third drafts were written in 2012 with the last draft submitted to Dr Sylvie Nadeau, Director of REPAR December 13rd, 2012. With Dr Nadeau`s approval, the third draft was then sent to members of the Advisory committee for comments. While awaiting feedback from the Advisory committee, the data related to the various funding sources and the Universities were sent to each for verification. This final report thus includes suggestions made by members of the Advisory committee and corrections to the data requested by the funding sources and Universities.

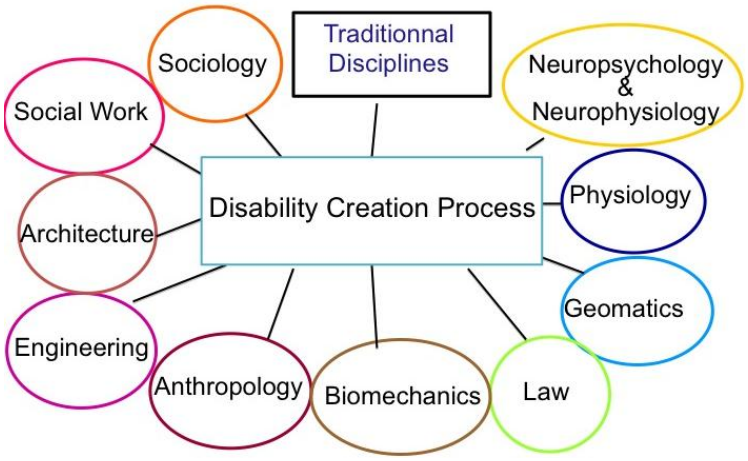
Defining the Field of Physical Rehabilitation

Since the publication of the World Health Organization's International Classification of Diseases in 1980, the concept of rehabilitation has changed dramatically. Traditionally recognized as a medically-oriented approach that concerned the diagnosis and treatment of physical disabilities, it has evolved into a bio-psycho-social concept that covers the continuum of needs related to physical disabilities. This continuum begins with the biological component of the body at the base of the problem, known as the impairment, which in turn leads to a disturbance in function, or disability. The person with a disability in for example, mobility or speech, then interacts with the environment (family, physical, educational, work, transportation, etc.) that either facilitates or is an obstacle to the performance of life roles.

Thus, originally the purview of physical and occupational therapists, speech and language pathologists, audiologists, optometrists and medical doctors specialized in physical rehabilitation, engineers and specialists in prosthetics, rehabilitation research today concerns a wide range of academic disciplines, including: psychology, social work, engineering (various specialties), computer programming, nursing, architecture, neuropsychology, physiologist, neurophysiology, kinesiology, specialists in brain imagery, neurology, orthopedic surgery, epidemiology, etc.

1. Interdisciplinary Research: Rehabilitation and Social Integration

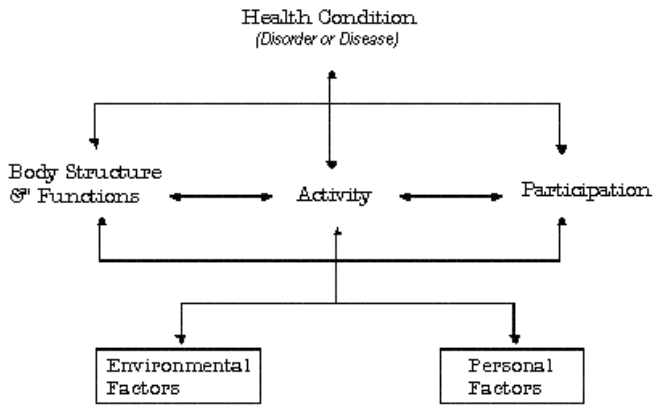
Figure 1. Interdisciplinary Research: Rehabilitation and Social Integration



Researchers and clinicians in many disciplines (not all shown) interact with traditional disciplines in the continuum of rehabilitation research from the initial impairment to social integration

In 2001, the WHO refined its concept of disability in its seminal publication of the International Classification of Functioning, Disability and Health. *Disability arises from the interaction of health conditions with contextual factors-environmental and personal*.

Figure 2. International Classification of Functioning and Health



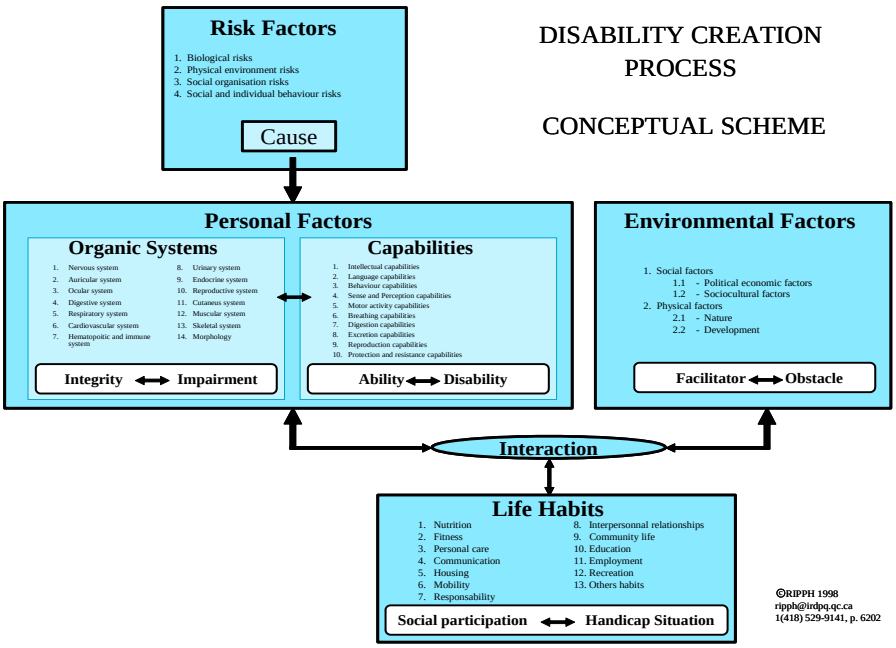
This ICF conceptual framework has been promoted as a “bio-psycho-social model”, that represents a compromise between medical and social models. In this model, disability is the umbrella term for impairments, activity limitations and participation restrictions, referring to the negative aspects of the interaction between an individual (with a health condition) and that individual’s contextual factors (environmental and personal factors) (Leonardi M et al. MHADIE Consortium. The definition of disability: what is in a name? *Lancet*, 2006,368:1219-1221).

Environmental factors include a wider set of issues than simply physical and information access. Policies and service delivery systems, including the rules underlying service provision, can also be obstacles (Miller P, Parker S, Gillinson S. *Disablism: how to tackle the last prejudice*. London, Demos, 2004).

1.1 Quebec

In Quebec, the modifications made by Patrick Fougeyrollas and his collaborators (1998) on the original WHO model that have resulted in a model known as the Disability Creation Process (see below) has been adopted by the Quebec Ministry of Health and Social Services as well as the research centers and the REPAR.

Figure 3: Disability Creation Process



The Disability Creation Process has inspired the organisation of research activities as well as the rehabilitation care process in the Province of Quebec

The first ever *World report on disability*, produced jointly by the WHO and the World Bank, suggests that more than a billion people in the world today experience disability. http://whqlibdoc.who.int/publications/2011/9789240685215_eng.pdf). This Report defines rehabilitation as:

> "*a set of measures that assist individuals who experience, or are likely to experience, disability to achieve and maintain optimal functioning in interaction with their environments*" (World Report on Disability, Chap.4, Rehabilitation, p.4, 2011).

Thus, according to this concept, rehabilitation targets improvements in individual functioning, be it mobility, speech, executive functioning or eating and drinking independently. It also includes making changes to the individual's environment such as installing ramps and handrails and rendering a home accessible in light of the individual's disabilities. Rehabilitation is thus cross-sartorial and may be carried out by health professionals in conjunction with specialists in education, employment, social welfare, architecture, engineering, city planning and other fields. It has been shown that rehabilitation, provided along a continuum of care from hospital care to rehabilitation in the community (Stucki G, Reinhardt JD, Grimby G. Organizing human functioning and rehabilitation research into distinct scientific fields. Part II: Conceptual descriptions and domains for research. *Journal of Rehabilitative Medicine: official journal of the UEMS European Board of Physical and Rehabilitation Medicine*, 2007,39:299-307), can lead to improved health outcomes, reduce costs by shortening hospital stays (Stucki G, Ustün TB, Melvin J. Applying the ICF for the acute hospital and early post-acute rehabilitation facilities. *Disability and Rehabilitation*, 2005,27:349-352;. Stucki G et al. Rationale and principles of early rehabilitation care after an acute injury or illness. *Disability and Rehabilitation*, 2005,27:353-359; Rauch A, Cieza A, Stucki G. How to apply the International Classification of Functioning Disability and health (ICF) for rehabilitation management in clinical practice. *European Journal of Physical Rehabilitation Medicine*, 2008,44:439-442), reduce disability, and improve quality of life (Forster A et al. Rehabilitation for older people in long-term care. *Cochrane Database of Systematic Reviews (Online)*, 2009,1CD004294- PMID:19160233; Khan F et al. Multidisciplinary rehabilitation for adults with multiple sclerosis. *Cochrane Database of Systematic Reviews (Online)*, 2007,2CD006036- PMID:17443610; Lacasse Y et al. Pulmonary rehabilitation for chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews (Online)*, 2006, 4CD003793- PMID:17054186; Davies EJ et al. Exercise based rehabilitation for heart failure. *Cochrane Database of Systematic Reviews (Online)*, 2010,4CD003331- PMID:20393935).

> *" In the years ahead, disability will be an even greater concern because its prevalence is on the rise. This is due to ageing populations and the higher risk of disability in older people as well as the global increase in chronic health conditions such as diabetes, cardiovascular disease, cancer and mental health disorders. Across the world, people with disabilities have poorer health outcomes, lower education achievements, less economic participation and higher rates of poverty than people without disabilities. This is partly because people with disabilities experience barriers in accessing services that many of us have long taken for granted, including health, education, employment, and transport as well as information. These difficulties are exacerbated in less advantaged communities."* (Dr M. Chan, Director-General, WHO and Mr R. Zoellick, President, World Bank Group in Preface to the World Report on Disability 2011*).*

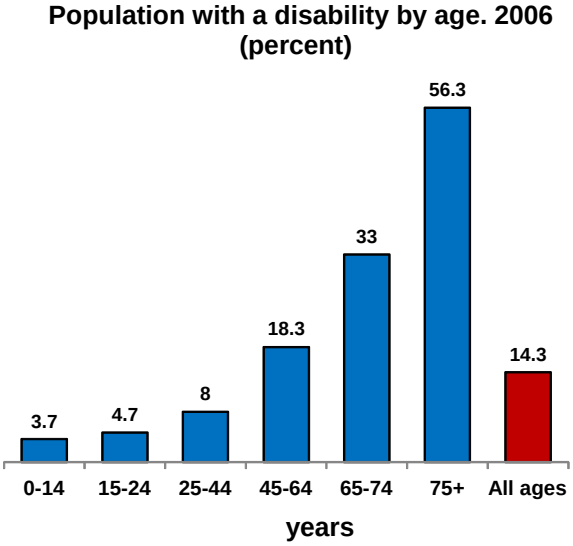
1.2 Canada

In Canada, approximately 3.6 million people in Canada have disabilities, representing 12.4 percent of Canada's population (Statistics Canada's Participation and Activity Limitation Survey, 2001 (PALS)). The disability rate increases with age. National statistics indicate that 41 percent of people aged 65 and over have a disability, while among those aged 15 to 64, 10 percent have a disability. Of the total population of Canadian children aged 0 to 14, 3 percent have a disability. Projections show that by 2021, seniors with disabilities will outnumber 25- to 64-year-olds with disabilities. In 2026, the majority of people with disabilities will be 65 years of age or older-some 3.05 million people.

In Canada between 2001 and 2006 the number of persons who reported having a disability increased by three-quarters of a million people (+21.2%), reaching 4.4 million in 2006. At the same time, the non-disabled population experienced lesser growth, increasing by 3.3% to reach 26.2 million people. As a result, the national disability rate increased 1.9 percentage points from its level of 12.4% (3,601,270 Canadians) in 2001 to reach 14.3% (4,471,870 Canadians) in 2006. The survey results confirm that the disability rate in Canada increases steadily with age. The rates of disabilities rose gradually as well within the working age population. For example, the youngest group aged 15 to 24 reported a disability rate of 4.7%, increasing to 6.1% for those aged 25 to 34. The rate continues to rise to 9.6% for those aged 35 to 44 and 15.1% for those aged 45 to 54. The largest proportion is found in the age group of 55 to 64 with a disability rate of 22.8%. (Citation: Disabled World News (2008-12-10) (http://www.disabled-world.com/disability/statistics/disability-statistics-canada.php#ixzz20p5CAOdP)

Disability rates varied across the country, ranging from 10.4% (765,000 persons) in Quebec to 20.0% in Nova Scotia. Provinces in Atlantic Canada had higher disability rates than western provinces, in part due to their populations being older on average. The Yukon had the highest disability rate at 13.5%, followed by the Northwest Territories at 8.6%, and Nunavut at 6.4%. (http://www.hrsdc.gc.ca/eng/disability_issues/mandate/initiatives.shtml)

Figure 4. Population with a Disability by Age (2006)

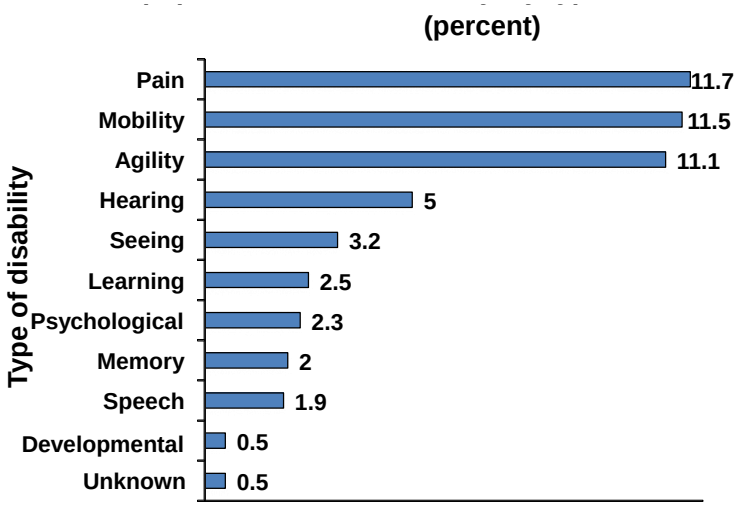


Note: Canada total includes Nunavut, the Northwest Territories, and Yukon. Source: Statistics Canada. *Participation and Activity Limitation Survey 2006: Tables.* Ottawa: Statistics Canada, 2007 (Cat. No. 89-628-XIE -

2. Type of Disability

Lack of mobility, pain, and reduced agility were the three most reported disabilities among adults aged 15 and over. Adults were most likely to report some limitations due to pain (11.7%) followed closely by a mobility disability (11.5%), and agility (11.1%). Women reported more of these types of disabilities than men (13.4% mobility, 13.3% pain, and 12.4% agility for women versus 9.5%, 10.0%, and 9.7% for men).

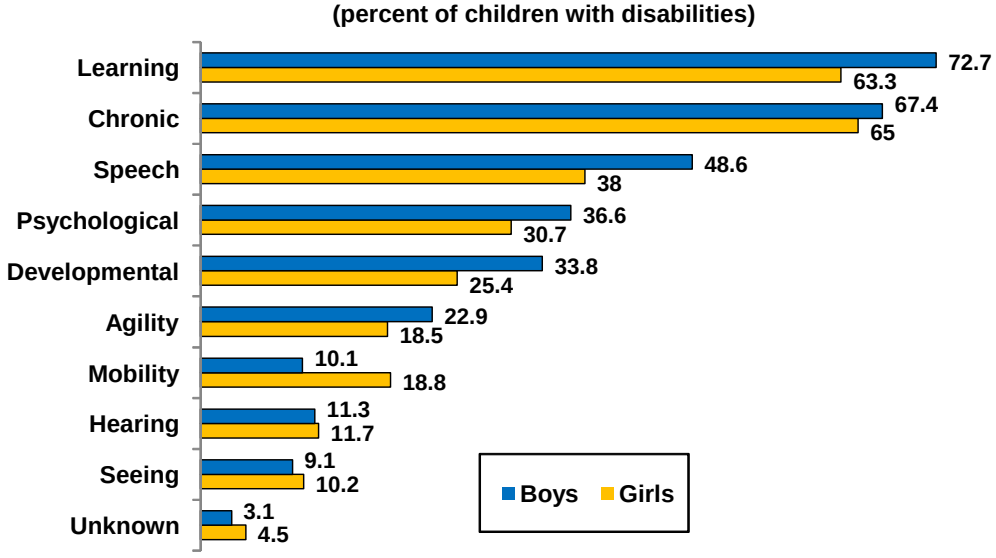
Figure 5. Adult Population with a Disability, by Type, Canada (2006)



Children with a Disability

There were 202,350 children (3.7% of children) between the ages of 0 and 14 years with a disability in Canada in 2006. A greater proportion of boys (4.6%) were reported to have a disability than girls (2.7%). Among school-aged children (aged 5 to 14) with a disability, learning disabilities was the most common disability for boys (72.7%), whereas chronic health conditions was the most common type for girls (65.0%).

Figure 6. Type of Disability Among Children aged 5-14 years, by Gender (2006)



3. Rehabilitation: A field of research that will impact on the lives of on an ever-increasing number of Canadians

The field of rehabilitation research has evolved dramatically over the last 40 years to try to meet the needs of persons with disabilities and to develop innovative ways of improving their lives. At any one time, one can estimate that about 25% of the Canadian population requires care from a rehabilitation specialist if temporary disabilities such as recovering from a fracture or tennis elbow, back pain or serious burn are included along with the permanent and long term disabilities. Because of the demographics of the Canadian population and the success of technologies and medical knowledge in preserving lives, this number will increase exponentially over the coming years.

At the beginning of the 1980s, Canada had only a few rehabilitation researchers, mainly in the traditional fields of physical and occupational therapy, physical medicine and rehabilitation engineering. Today, the field of rehabilitation encompasses a wide range of scientists in different fields interested in the continuum of needs experienced by persons with disabilities from the hospital bed to their integration into society.

4. The challenge

This modern concept of rehabilitation presents an enormous challenge when attempting to provide a picture of both the number of researchers applying for research funds, the amount of funds available and the success rates of those that apply. The information provided in this report has many limits in addition to the basic problem of gathering all that pertains to the concept or definition of rehabilitation. These limits include: the difficulties involved in obtaining information from the various funding agencies, their different definitions of rehabilitation as well as their different ways of summarizing the information. These different practices of data gathering led to unmatched figures for the same time frame.

It was particularly difficult to obtain information on the evolution of the number of researchers applying for rehabilitation research funds over the years. Quebec is the only province that has a Provincial Rehabilitation Research Network (known as REPAR). This network includes most of the researchers interested in rehabilitation in the Province. When we compared the numbers supplied by REPAR with those gleaned from the University Departments with Programs in Physical and Occupational Therapy and Speech and Language Pathology, we realized that at least 30% of the researchers were unaccounted for and likely represented those in non-traditional rehabilitation disciplines like psychology, social work, various types of engineers and computer experts and basic scientists.

Funding for rehabilitation research in Canadian provinces

This section reports on the data available from funding agencies in four provinces: Quebec, Alberta, British Columbia and Ontario.

1 Quebec

The *Fonds de la recherche en santé du Québec* (FRSQ) which became the *Fonds de recherche du Québec - santé* (FRQS) in 2011, designated the development of research activities in the field of rehabilitation to be a priority from the early 1980s. This opened the door to researchers in this field to obtain MSc and PhD studentships at the same level as candidates with medical degrees and to 4-year scholar programs (investigator salary awards) from junior to senior levels. Another initiative was the development of two Research Consortia (1989-1994) that encouraged clinicians to partner with established University researchers to carry our pilot research projects. These Consortia also introduced the beginnings of a research infrastructure in rehabilitation establishments.

The *Conseil québécois de la recherche sociale* (CQRS) which became the *Fonds québecois de la recherche sociale et de la culture (*FQRSC) and since 2011 the *Fonds de recherche du Québec - Société et culture (FRQ-SC),* funds research relating to the more social aspects of rehabilitation. This funding agency also developed special programs and team grants to spur the development of research in the social aspects of rehabilitation and also funded career grants up to 2002. The FQRSC also contributes to the infrastructure funding of the two research centers (CRIR and CIRRIS) dedicated to research along the whole rehabilitation continuum.

In 2001, le Fonds québécois de la recherche sur la nature et les technologies (FQRNT) was replaced by the Fonds pour la Formation de chercheurs et l'aide à la recherche (FCAR). In 2011, with the restructuring of research in the Province this fund was renamed le *Fonds de recherche du Québec - Nature et technologies* (FRQ-NT). Mainly responsible for research related to the natural and mathematical sciences and engineering, its contribution was minimal to rehabilitation research and was dropped from the Ministry of Health and Social Sciences data bank. Contributions from this funding agency are therefore not included in this scan.

Following the success of the Research Consortia funded by the FRSQ, the next step was the development of a Rehabilitation Provincial Research Network (REPAR) that played an important role in defining a research model (based on the PPH model) and bringing together researchers in non-traditional disciplines with those in more traditional disciplines to carry out interdisciplinary and inter-University pilot projects funded by the network. It also had a marked impact on research capacity by granting about 50 studentships and postdoctoral awards and some investigator salary awards. The REPAR, created in 1994, continues to play an important role in rehabilitation research in Quebec today (Réseau provincial de recherche en adaptation-réadaptation; http://www.repar.ca/FR/000/default.asp).

In the year 2000, the research capacity in the Province led to the creation of two Research Centers dedicated to rehabilitation research along the full continuum from impairment to social integration. In addition to these two new Research Centers, other Research Centers such as those dedicated to research in aging (one in Montreal and the other in Sherbrooke), had a research focus on rehabilitation. The Province of Quebec has 19 Research Centers funded by the FRQS with different

research foci and many of these have among their membership, researchers involved in basic, clinical or epidemiological research related to the neurosciences, musculoskeletal, cardiorespiratory or mental health related to rehabilitation. This report does not specifically track researchers who are not members of the four Research Centers with specific rehabilitation themes. An estimate of the number of these researchers is made from the available data from the four Research Centers with rehabilitation themes and the REPAR.

1. *Fonds de la recherche en santé du Québec* (FRSQ): The FRSQ is the provincial funding agency that plans the development of the health research sector. It became the *Fonds de recherche du Québec-santé* (FRSQ) in 2011. The FRSQ gave us access to their detailed database on studentships, career awards and research projects. Contributions of the FRSQ to infrastructure grants to Research Centers and Research Networks were not included in the data bank.

Table 1. FRSQ: Distribution of investments in training, career awards and grants (2004-2011)

Type of investments	Amount Non-rehab	Amount Rehab	Total	% Rehab
Training awards	$ 33 568 155	$ 3 280 728	$ 36 848 883	8,9 %
Career awards	$ 42 502 313	$ 3 671 365	$ 46 173 678	8,0 %
Research grants	$ 7 065 795	$ 768 187	$ 7 833 982	9,8 %
Total	$ 83 136 263	$ 7 720 280	$ 90 856 543	8,5 %

Figure 7. Evolution of funds over the years by FRSQ

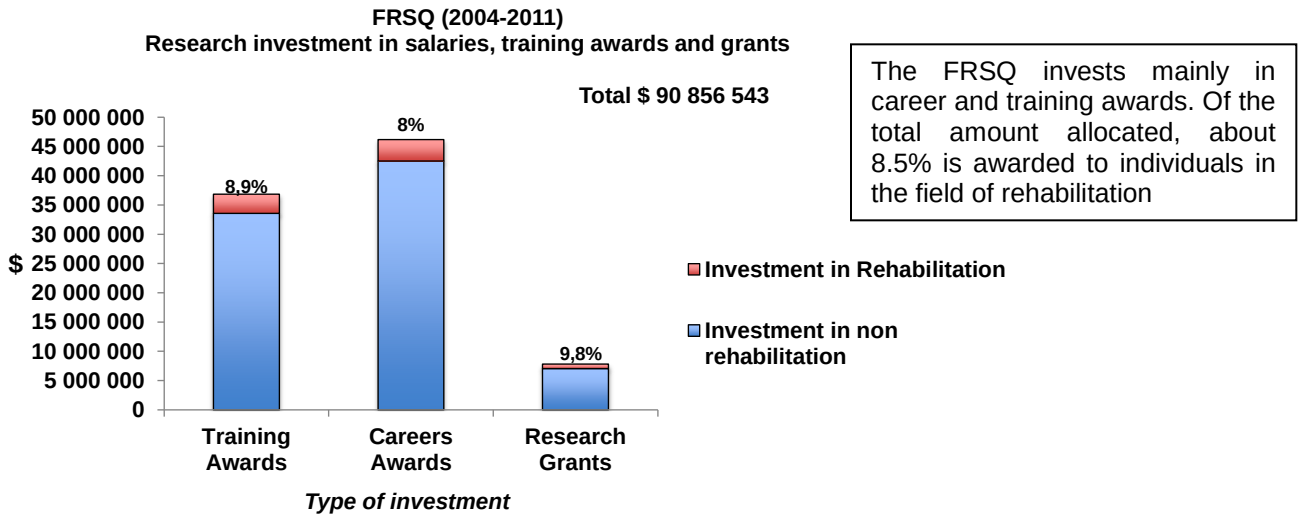
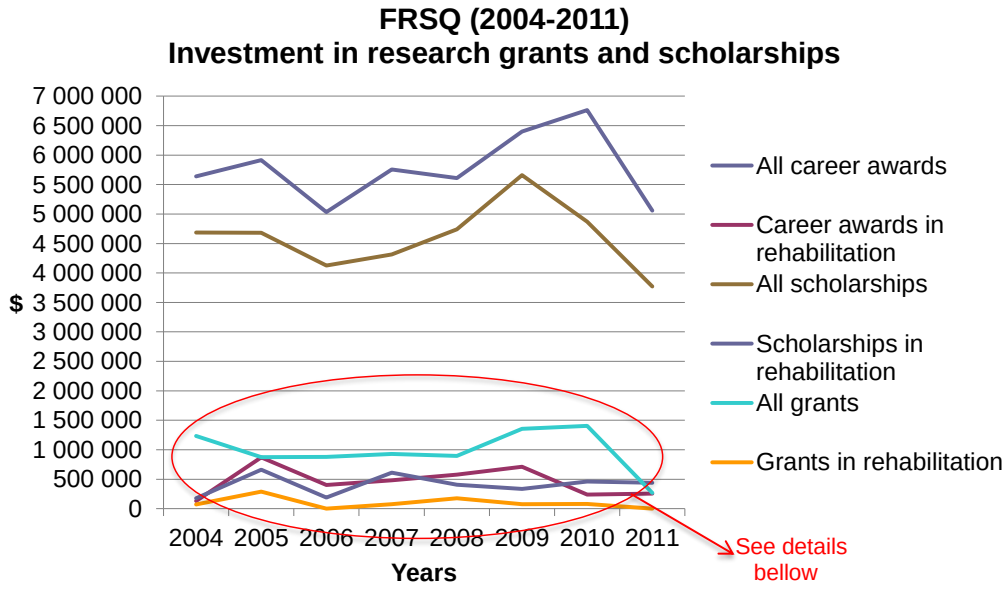


Figure 8. Evolution of funds granted over the years by the FRSQ



This graph illustrates the distribution (rehabilitation awards compared to all other awards) of career, scholarships and research grants over the years.

Figure 9: Detailed view for the rehabilitation sector of Figure 8

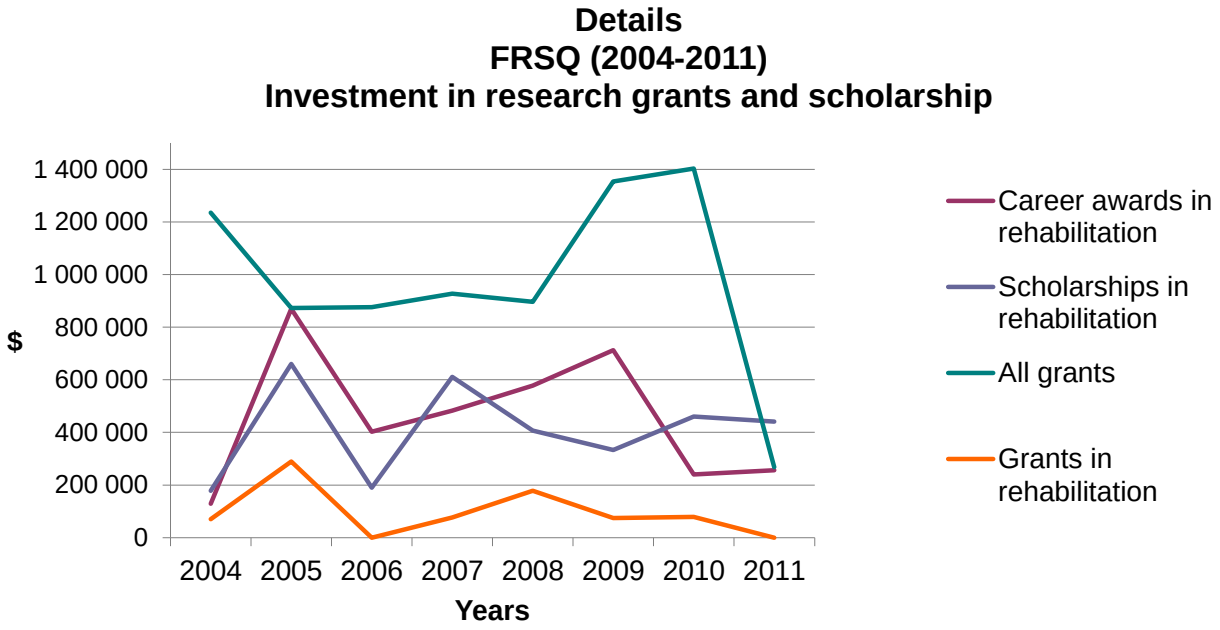
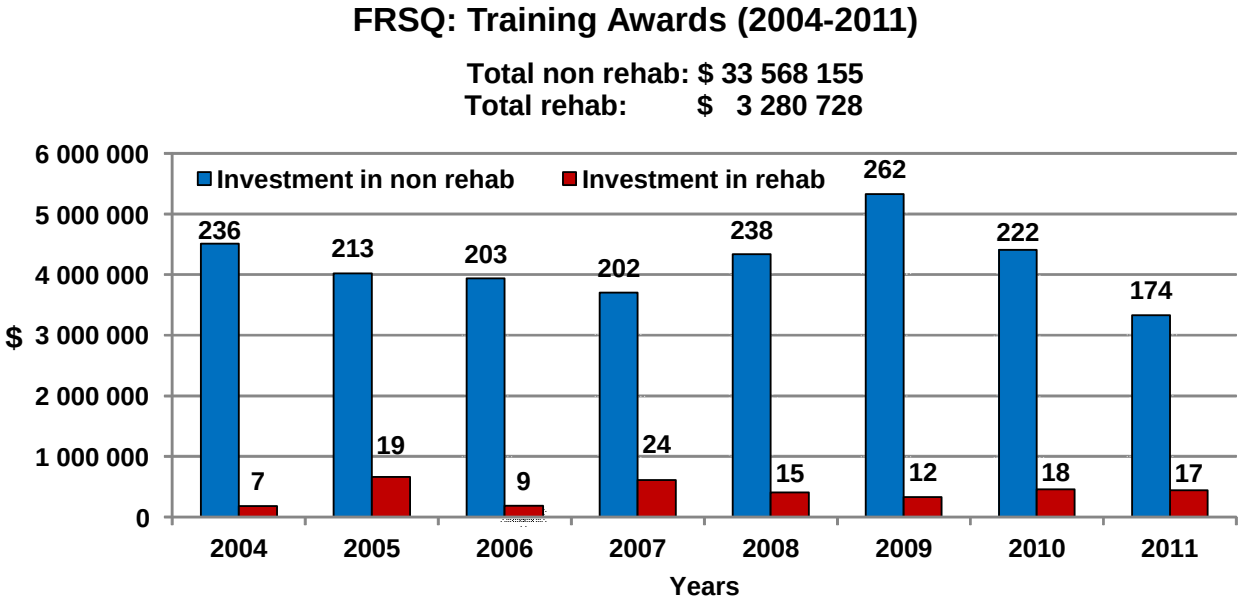


Figure 10: Comparison of the monetary amount and number of training awards to candidates in rehabilitation compared to all other areas.



The actual number of awards in rehabilitation (number above each column) has decreased since a peak of 24 in 2007.

As illustrated in the following table, the financing rate (%) in the different studentship and post-doctoral programs over the years for rehabilitation is generally similar to or superior to the rate for candidates in all other fields of study except for the post-doctoral candidates since 2008. Numbers give percent success for other programs followed by the success rate for rehabilitation in parentheses.

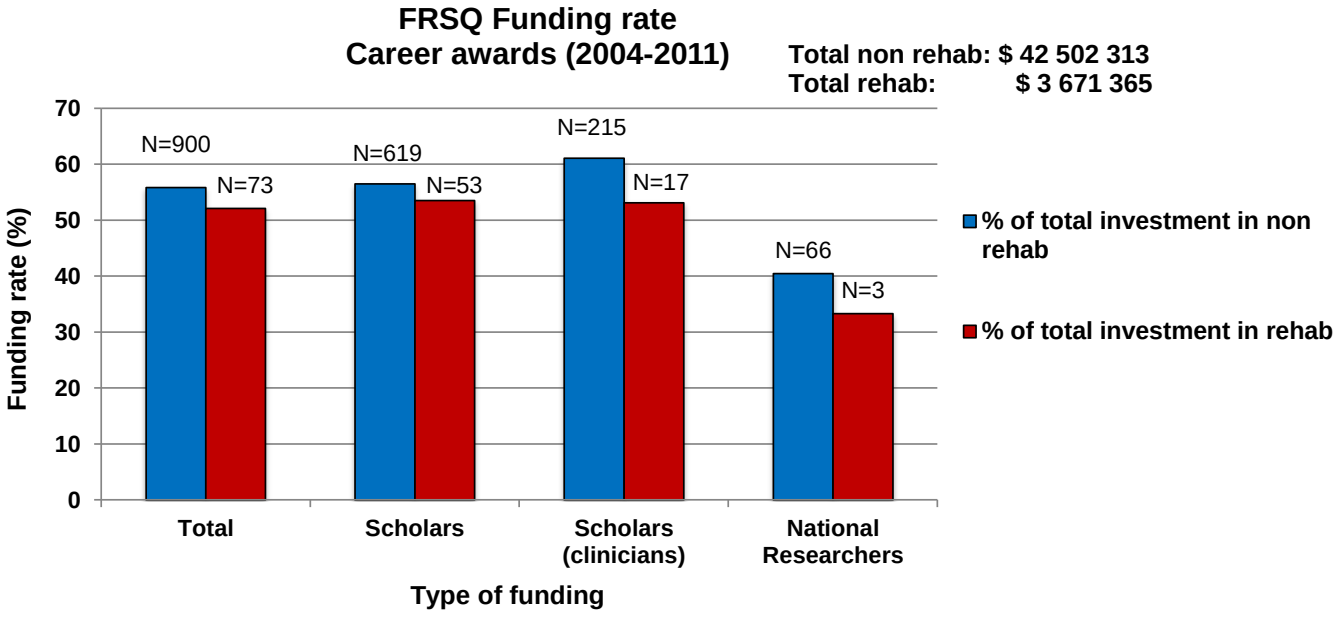
Table 2. FRSQ Funding Rate (2004-2011)

FRSQ financing rate* (2004-2011) % of applications	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Masters' degree ***All (rehab)***	ND (ND)	24 (25)	20 (38)	34 (50)	34 (33)	42 (25)	37 (50)	31 (40)
Professional Masters' degree ***All (rehab)***	59 (50)	48 (50)	44 (67)	59 (50)	61 (33)	67 (63)	75 (67)	42 (50)
PhD degree ***All (rehab)***	29 (100)	25 (29)	22 (22)	26 (18)	32 (38)	27 (25)	21 (23)	20 (23)
Professional PhD ***All (rehab)***	56 (50)	44 (64)	45 (25)	45 (67)	57 (60)	48 (100)	56 (67)	26 (25)
Postdoctoral Fellowships** ***All (rehab)***	40 (100)	39 (33)	27 (20)	39 (64)	40 (33)	50 (29)	48 (30)	29 (20)

** Funding rate: Number of funded applications / number of recommended applications.** Postdoctoral Fellowship (Canadian citizen and landed immigrant) and Postdoctoral Fellowship (citizen from other countries). Before 2009, the data for these two Postdoctoral Fellowship programs were combined. This is why both programs are included in the same row.*

The professional M.Sc. and Ph.D. programs are for applicants with a professional licence (e.g. nurses, physiotherapists, occupational therapists, physicians and psychologists) embarking in graduate studies. The yearly grants, depending on experience, can be up to nearly 40,000$. This program has had a marked impact on the recruitment of graduate students, University Faculty members and on research capacity in rehabilitation.

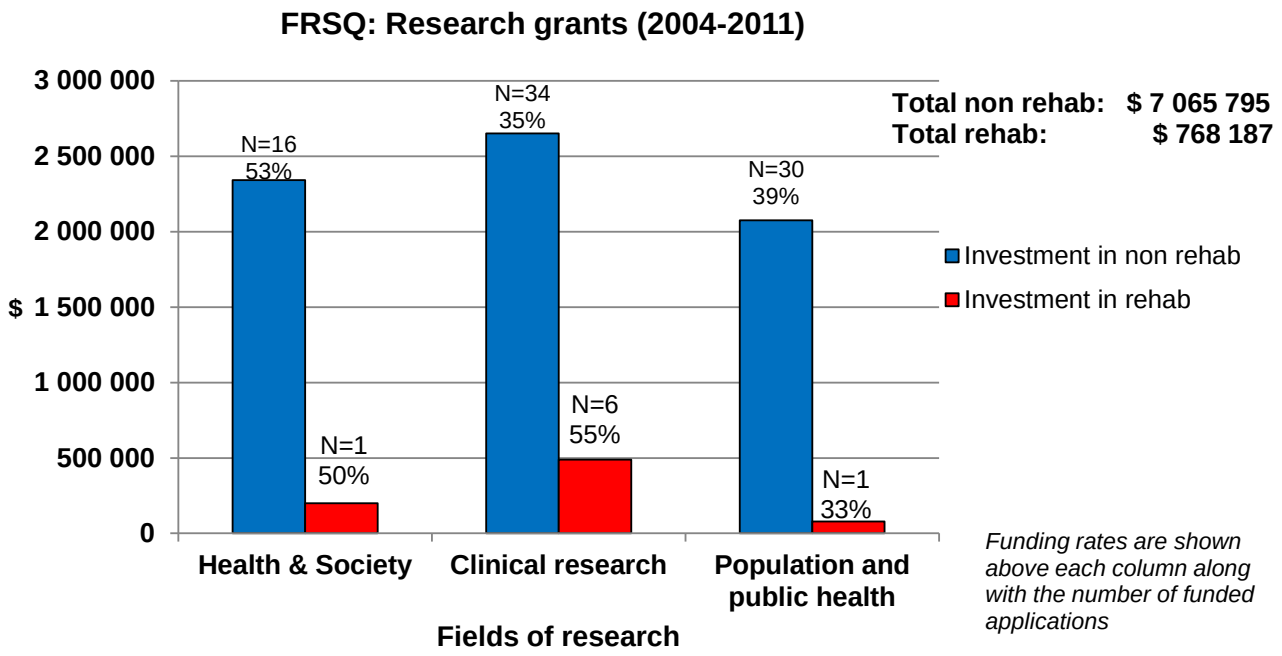
Figure 11. Comparison of the average funding rate and number of career awards granted by the FRSQ from 2004-2011



From 2004-2011, the 73 rehabilitation career awards that were funded had an important impact on the recruitment of University Faculty and of researchers in the Research Centers. Over the years, the average funding rate for career awards is somewhat lower in the field of rehabilitation. Also, fewer rehabilitation professionals have received clinician career awards and even less (n=3) have attained a national scholar status.

Although the total amounts awarded for research grants in rehabilitation in the different categories is much less than the amount awarded for all other fields, the success rate of the rehabilitation submissions is similar or superior (clinical research) indicating a lack of submissions rather than available funds.

Figure 12. Comparison of the total amount, number and success rates of grants submitted and awarded from 2004-2011



Sources

Data presented in this section from FRSQ was provided by:

- Dr Howard Bergman, Vice-president and Scientific Director
- Mme Julie Gaudreau, Chef des projets informationnels et des analyses

1.2 Research Centers and Provincial Networks

In addition to career and training awards and research projects, the FRSQ supports 19 Research Centers and 16 Provincial Networks.

http://www.frsq.gouv.qc.ca/fr/centregroupereseau/centres/centres_liste.shtml

http://www.frsq.gouv.qc.ca/fr/centregroupereseau/reseaux/reseaux_liste.shtml

Research Centers and Provincial Networks with a main or a significant rehabilitation research component include:

Research centers

- Centre de recherche en réadaptation de Montréal Métropolitain (CRIR) in Montréal**
- Centre de recherche en réadaptation et intégration sociale (CIRRIS) in Quebec City**
- Centre de recherche sur le vieillissement du Centre de santé et de services sociaux - Institut universitaire de gériatrie de Sherbrooke (IUGS) (*has a rehabilitation component*)
- Centre de recherche de l'Institut universitaire de gériatrie de Montréal (CRIUGM) (*has a rehabilitation component*)

Provincial networks dedicated to rehabilitation or having a rehabilitation component include:

- Réseau provincial de recherche en adaptation-réadaptation (REPAR)
- Réseau québécois de recherche sur le vieillissement (RQRV)+
- Réseau québécois de recherche sur la douleur (RQRD)+
- Réseau de recherche en santé de la vision (RRSV)+

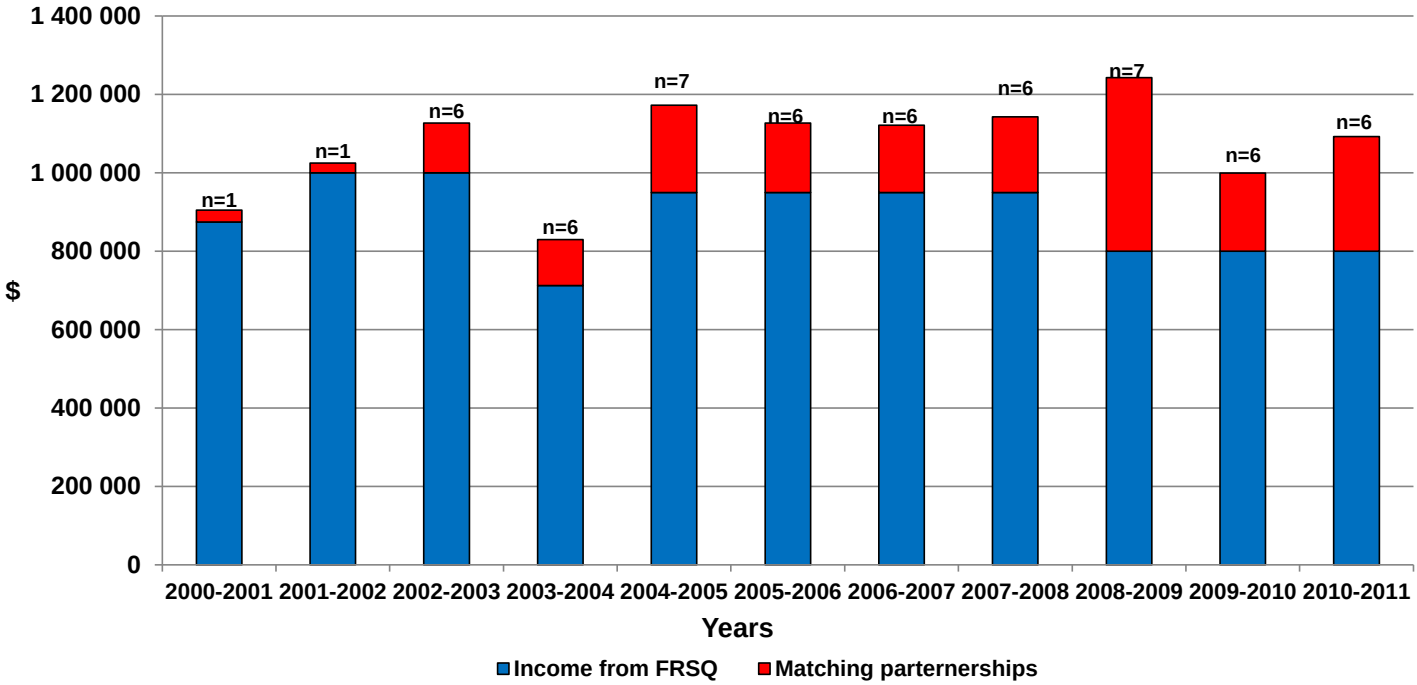
+ Networks with partnership projects with REPAR

** The **two research centers** dedicated to research in rehabilitation and social integration are funded by 3 sources: the MSSS (Quebec Health and Social Services Ministry), the FQRSC (social research) and the FRSQ (health research). These two rehabilitation research centers receive infrastructure funds annually, estimated at 1.8 million $ (combined) since the year 2000-2001, for a total investment of about 19.8 million $. If we estimate the infrastructure funds received for rehabilitation research in the two Geriatric research centers to be 900,000$ (combined)[2]* annually, this means an additional 9.9 million$ for a total of 27.7 M$ for infrastructure to the research centers.

REPAR

Funds allocated to the REPAR research network by the FRSQ are used to promote the development of rehabilitation research, including knowledge translation in the Province of Quebec and in the promotion of collaborations with colleagues in other Canadian provinces and internationally. From a peak of 1 million$ from 2001-2003, the FRSQ grant has diminished over the years. The graph below illustrates the amount of the FRSQ grant supplemented by matching contributions from partners (indicated above each column) over the years.

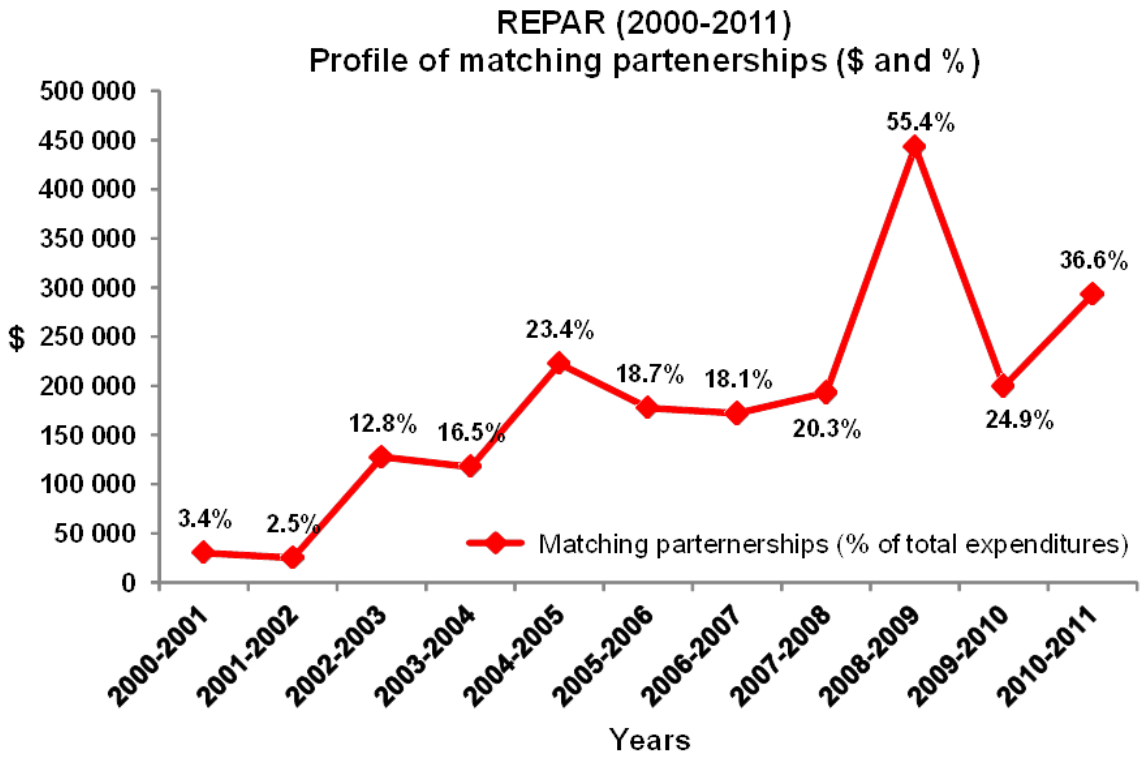
Figure 13. REPAR (2000-2011) Expenditures for partnerships



Total in grants from the FRSQ 2000-2011 = 9 787 500$;
Partnerships = 2 000 481$ or a mean of 21.1.% /yr for matching grants to augment the funds available.

[2] *Estimated from data provided for years 2000 and 2010 by the Scientific Director of the CRIUGM

Figure 14. REPAR matching-grant partnerships



SOURCES
Data for REPAR was provided by :

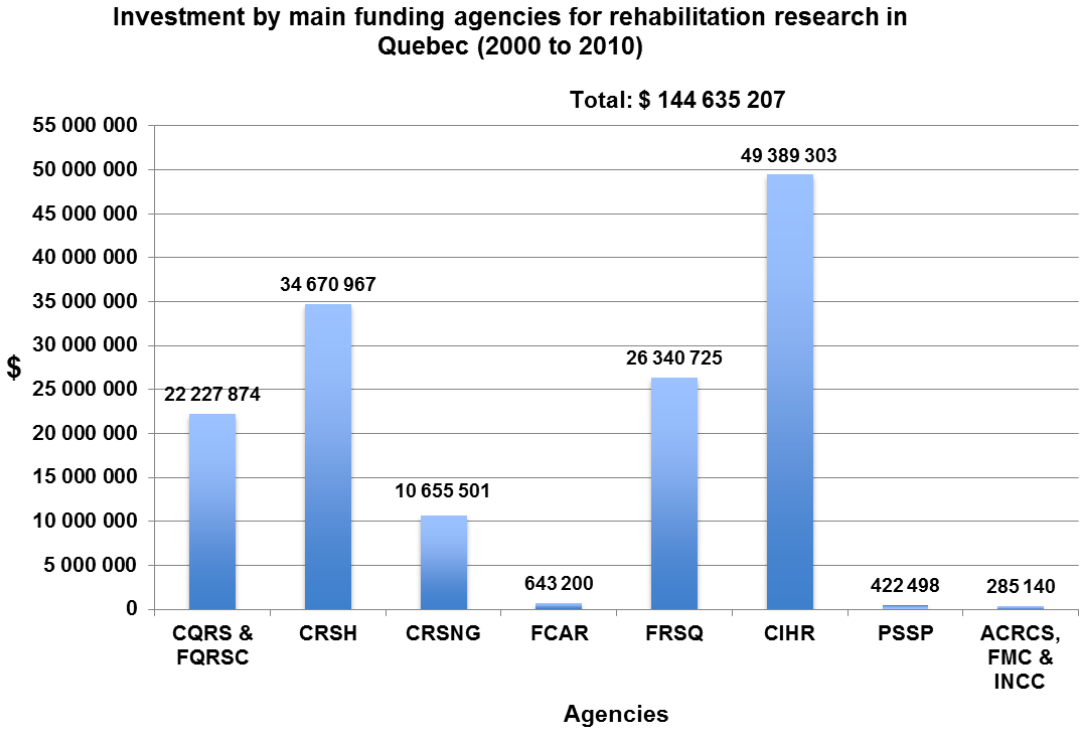
Dre Sylvie Nadeau, Directrice scientifique

Table 3. Summary of Contributions of the Province of Quebec to Rehabilitation Research Infrastructure

2000-2011	**Amounts**
CRIR and CIRRIS Research Centers	19.8 M$ (approx.)
IUGS and CRIUGM Research Centers	9.9 M$ (estimate)
REPAR Research Network	9,787,500 $
Total	**39,487,500 $**

1.3. Quebec Ministry of Health and Social Services Data Bank *(Banque sur la Recherche sociale et en santé (BRSS) du MSSS (2000-2010)*

Figure 15. Summary of rehabilitation research funds invested in Quebec by the main provincial and federal funding agencies for the years 2000-2010 documented by the BRSS bank



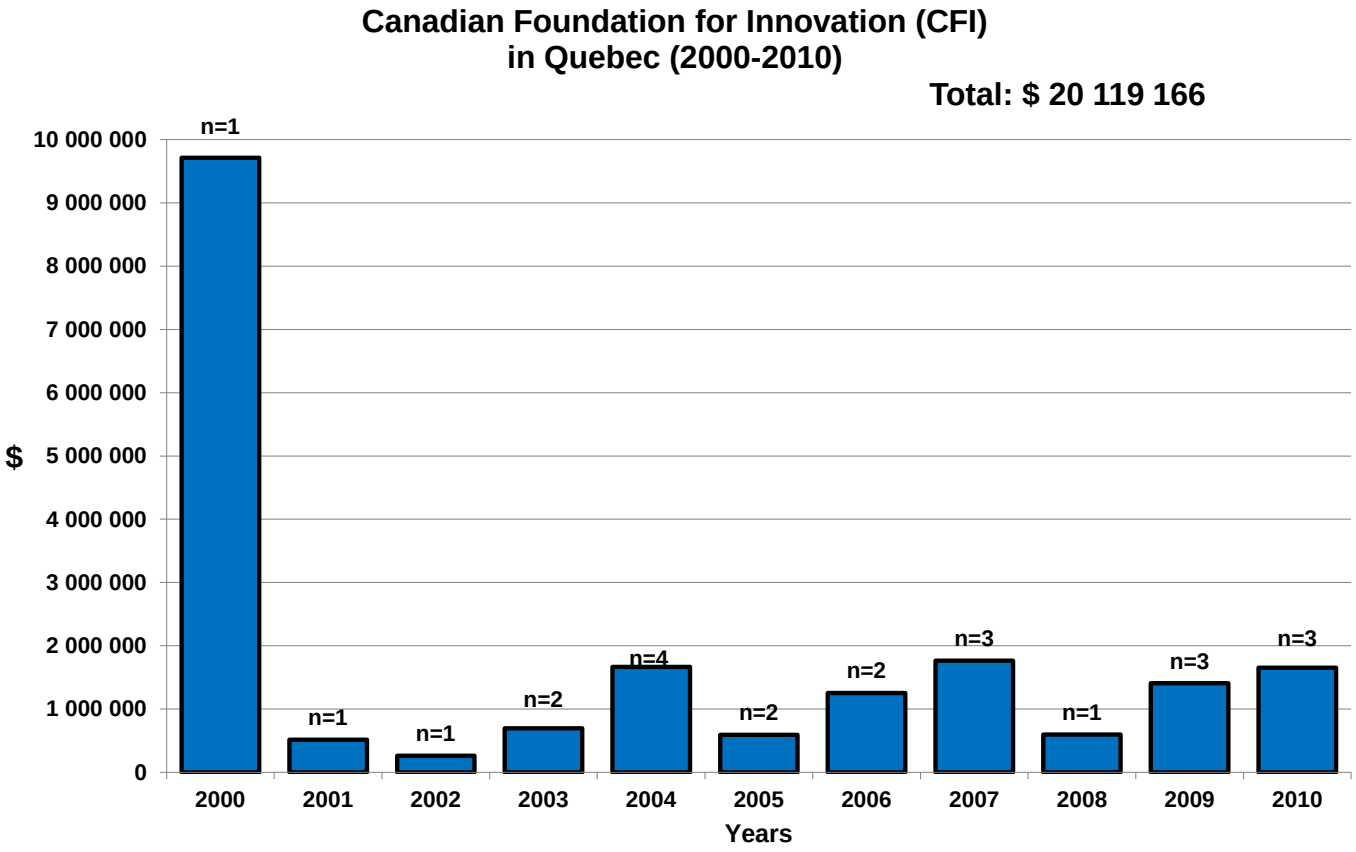
About 144 million $ have been invested by 10 different agencies (see list in Appendix 2) in rehabilitation research as documented in the BRSS-MSSS data bank since the year 2000. Funding for research groups, networks or centers are not included

Note: CQRS became FQRSC in 2001. In the graph above, data from these two agencies are compiled together. Additional information regarding the data is available in Appendix 2. Data for research groups, networks and centers are not included. Details concerning the data included in Figure 15 are also provided in Appendix 2.

This figure illustrates the important contribution made to rehabilitation research in the Province of Quebec by the three main federal research funding agencies (IRSC (CIHR), CRSH (SSHERC) and CRSNG (NSERC) as captured in this data bank.

1.4. The Canadian Foundation for Innovation in Quebec

Figure 16. Canadian Foundation for Innovation Grants Related to Rehabilitation



This graph gives an approximation of the number and amount of CFI grants awarded to rehabilitation researchers in the Province of Quebec. Data for CFI projects came from the *système d'information des infrastructures de recherche (SiiR)* of the Ministère de l'Enseignement supérieur, de la Recherche, de la Science et de la Technologie. Projects were identified by C. Richards from a list of projects contained in the BRSS data bank. (Unable to verify accuracy of the data in the Figure).

Sources

Data from the BRSS was provided by :

- Mme Manon St-Pierre, Directrice à la Direction de la recherche, de l'innovation et du transfert des connaissances, MSSS
- Mme Julie Couture, Conseillère en orientation et coordination de la recherche et de l'innovation, Direction de la recherche, de l'innovation et du transfert des connaissances, MSSS
- M. Éric St-Gelais, Conseiller en orientation et coordination de la recherche et de l'innovation, Direction de la recherche, de l'innovation et du transfert des connaissances, MSSS
- M. Pierre Arcand, Technicien en recherche, Banque sur la recherche sociale et en santé (BRSS), Direction de la recherche, de l'innovation et du transfert des connaissances, MSSS
- M. André Charest, Programmeur-analyste, Direction des études et analyses, MSSS

Collaboration

- M. Yvan Létourneau et Mme Marie Adey, Étudiants – stagiaires, MSSS.

1.5 Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST)

The IRSST invests in projects related to the rehabilitation of worker-related injuries and their prevention. The Institute partners with the REPAR in a funding program.

Figure 17a. Investments by the IRSST in grants

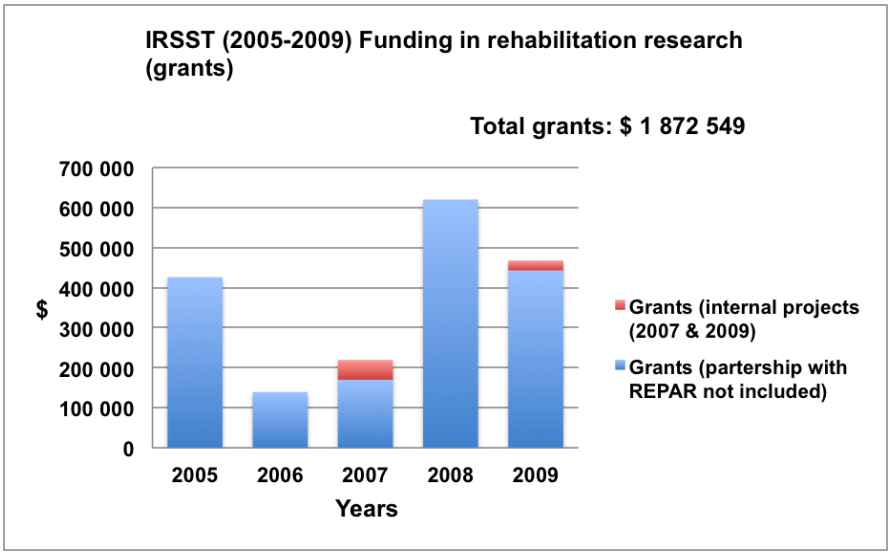
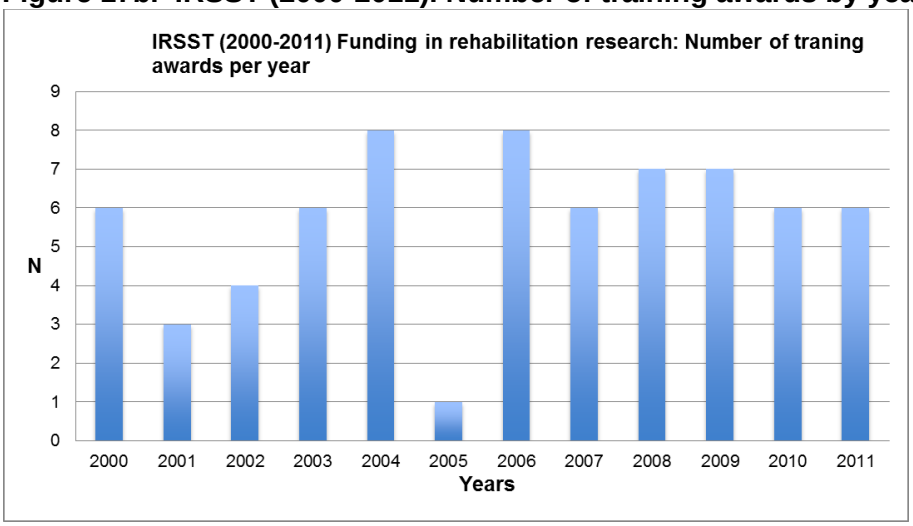


Figure 17b. IRSST (2000-2011). Number of training awards by year



Sources
Data for IRSST provided from :

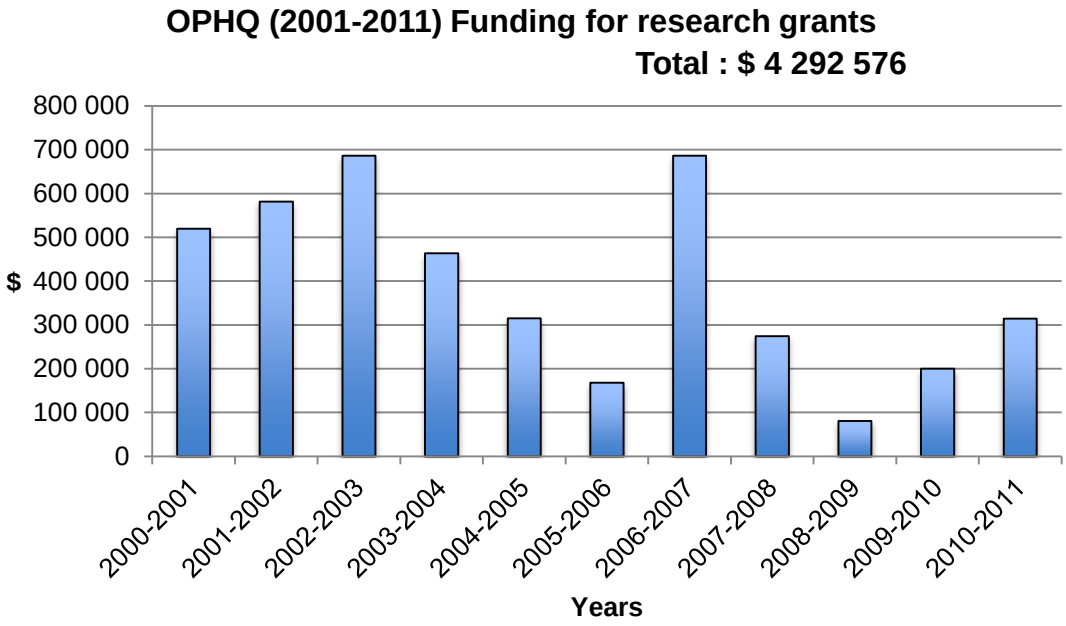
Training awards
Site internet de l'IRSST avec la collaboration de Michel Asselin, Conseiller en gestion de la recherche, Programmes de subventions et de bourses d'études supérieures, IRSST.
Rodica Tcaciuc, Conseillère en gestion de la recherche.

Grants
M. Daniel Côté, Professionnel scientifique, Service veille et gestion de la qualité à l'IRSST.

1.6. Office des personnes handicapées du Québec (OPHQ)

The *Office des personnes handicapées du Québec* (OPHQ) also offers funds for rehabilitation research.

Figure 18. OPHQ investment in rehabilitation research grants



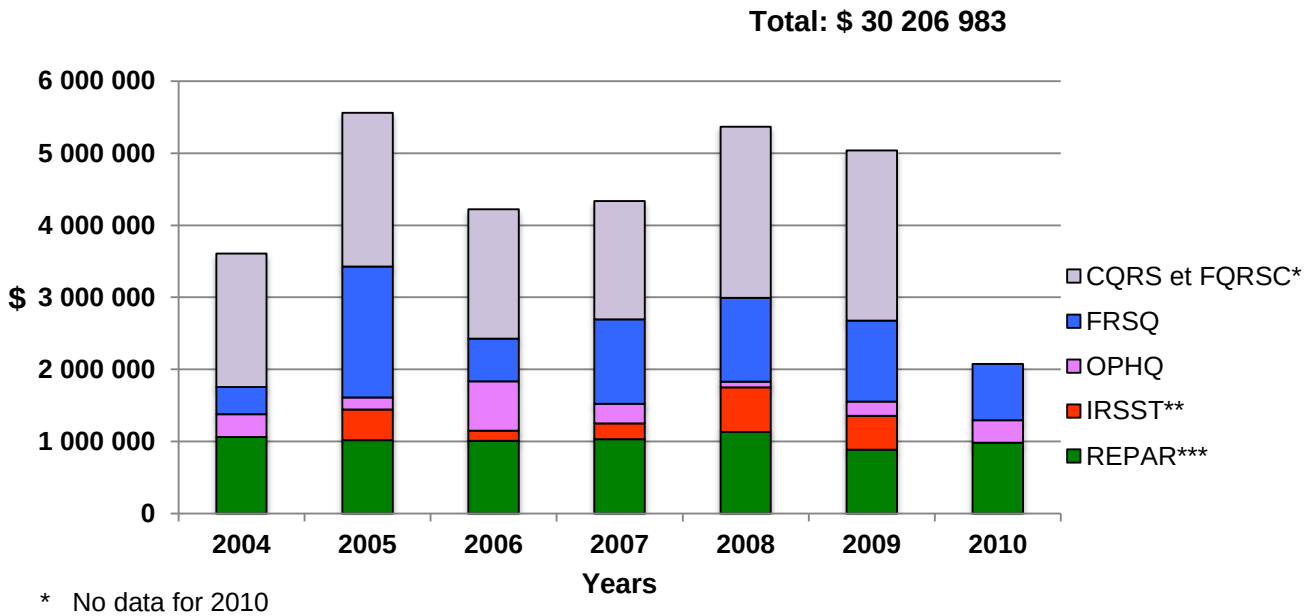
Data includes grants awarded from the following programs: Programme de subventions à l'expérimentation (PSE), Innovation communautaire et Études et recherches. The aims of PSE grants are to support experiments in new and innovative services, goods, technical aids, and interventions to meet the needs of people with disabilities and to support research projets concerning social participation. Thus, the projects funded in this programme are diversified and concern all life habits of person with disabilities not only rehabilitation. Partnership funds with REPAR are not included.

Sources

Data for OPHQ was provided from:

M. Daniel Lavigne, Conseiller, Direction de l'évaluation, de la recherche et des communications organisationnelles

Figure 19. Summary of Research Investments in Rehabilitation in Quebec (Training Awards and Grants)



* No data for 2010
** Grants only. Data for 2005 to 2009
*** Total without management and salaries

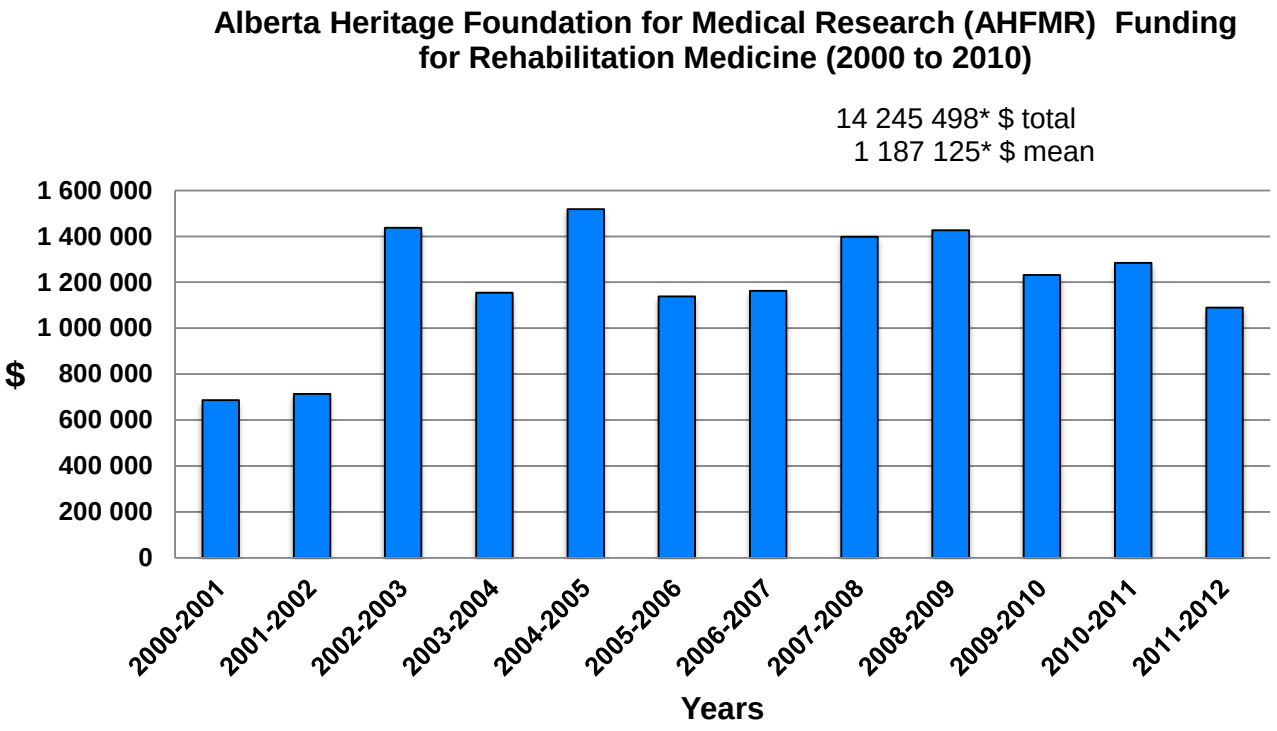
Data is presented for the years 2004-2010 because these were the years that data was available for all the funding sources. The data for REPAR represent the amount dedicated to research (including partnerships); management costs were subtracted. REPAR partnerships are: IRSST, OPHQ, SAAQ, CIHR and the CSN.

The years indicated in the above graph reflect the availability of data for all organizations. REPAR data represents amounts granted in the context of partnerships and amounts spent on research. Management fees have been deducted from the total. REPAR partners with the IRSST, OPHQ, SAAQ, CIHR and Canadian Stroke Network (CSN). Funds from federal agencies such as the CIHR, the SSHRC and the NSERC can be found in separate graphs comprising data for all of Canada. Finally, funds from Canadian organizations outside Quebec are not included in the above data. There is no data for the CQRS and FQRSC for 2010.

2. Alberta

2.1 Alberta Heritage Foundation for Medical Research (AHFMR)

Figure 20. Investments in Rehabilitation Research by AHFMR



*All amounts are approximate

In Alberta, the major funding agency, the Alberta Heritage Foundation for Medical Research (AHFMR), ceased operations as of December 31, 2009 but expenditures continued to honour long term awards. AHFMR made the majority of the funding contributions to salaries and benefits of investigators. Other types of funding include: visiting lecturer grants, conference grants, secretarial support, lab renovations, summer studentships, research allowances, and AHFMR research prizes. The latter were amounts of money given to each of our funded investigators each year (amounts determined by seniority of AHFMR funding category) to enhance their competitiveness. The amounts shown in the graph are approximate.

Sources
Data for AHFMR was provided by:

Kathleen Thurber, Director, Communications & Education, Alberta Innovates - Health Solutions

On January 1, 2010, the AHFMR became Alberta Innovates - Health Solutions, part of the province's stronger, more aligned research and innovation system described in Bill 27, the Alberta Research and Innovation Act. This scan does not include funds allocated by this new agency.

3. British Columbia

3.1. Michael Smith Foundation for Health Research (MSFHR)

The Michael Smith Foundation for Health Research (MSFHR) harnesses the power of health research to improve the health of British Columbians and their health system. It does this by building BC's capacity for world-class research by funding the best scientists; coordinating the sharing of health research resources across the province; and bringing people together for health research planning and action. Learn more at www.msfhr.org.

Figure 21. MSFHR Investments in the Rehabilitation Sciences

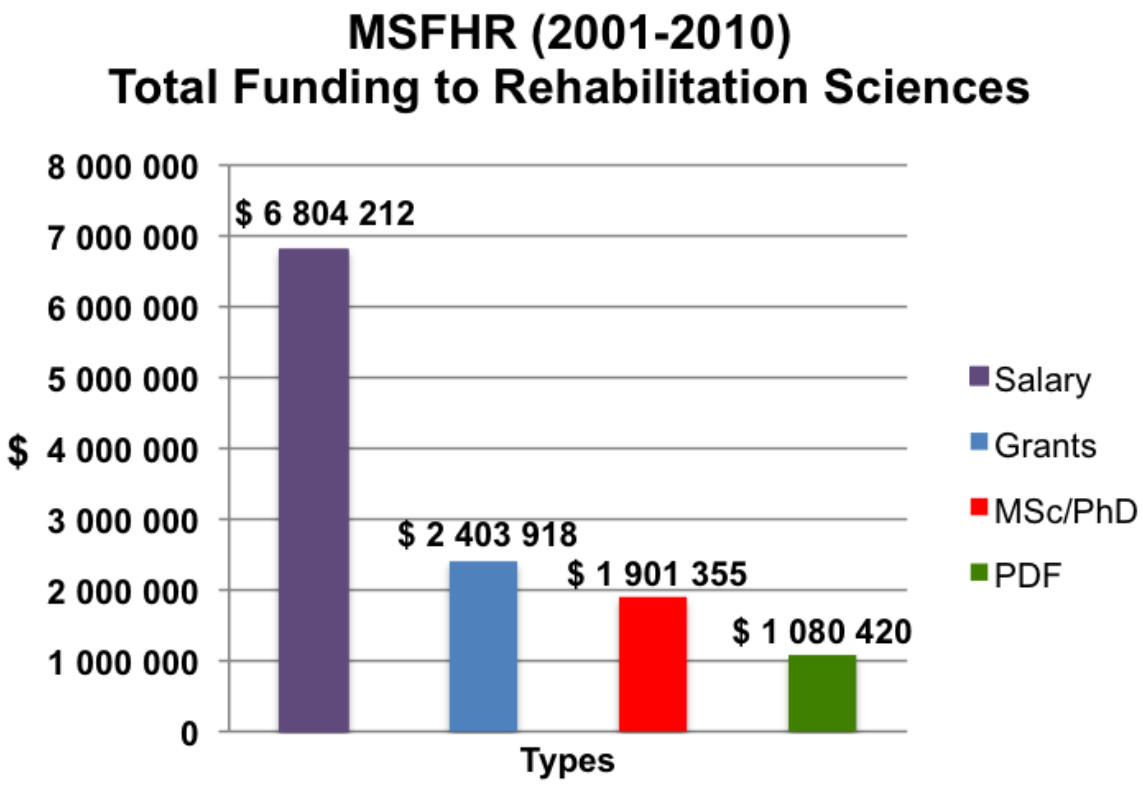
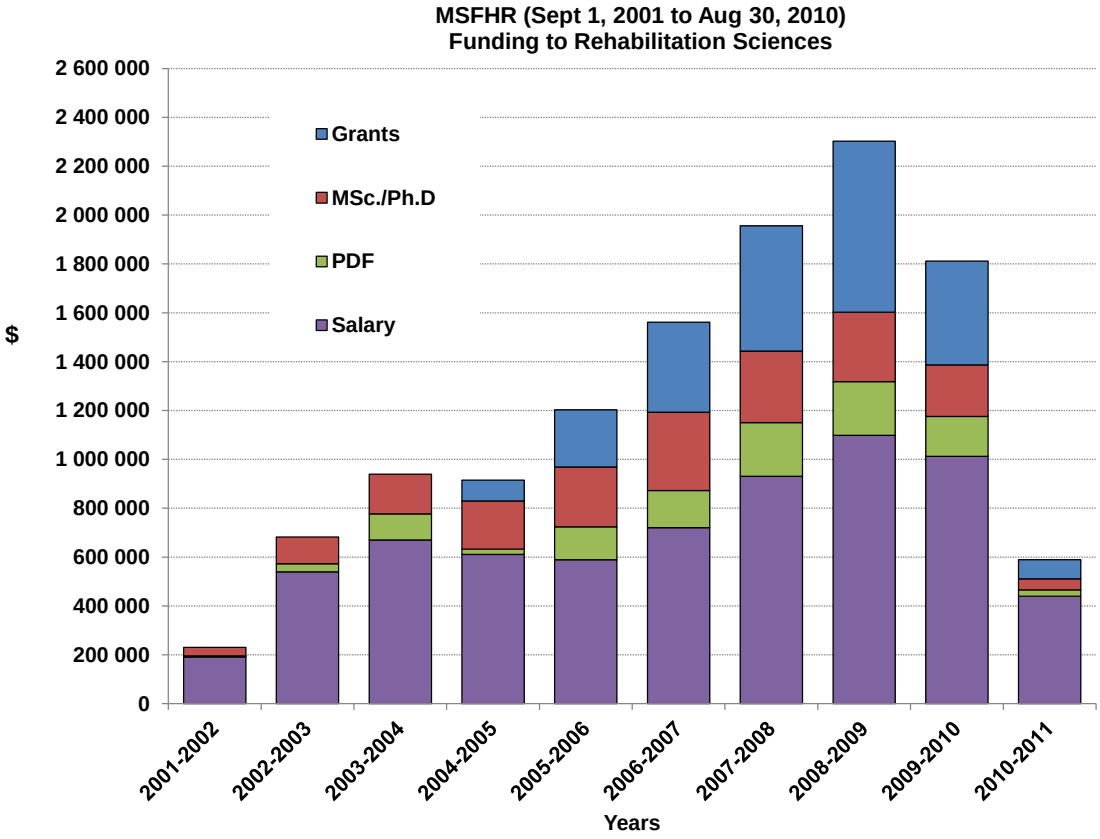


Figure 22: MSFHR Investments in the Rehabilitation Sciences over the years



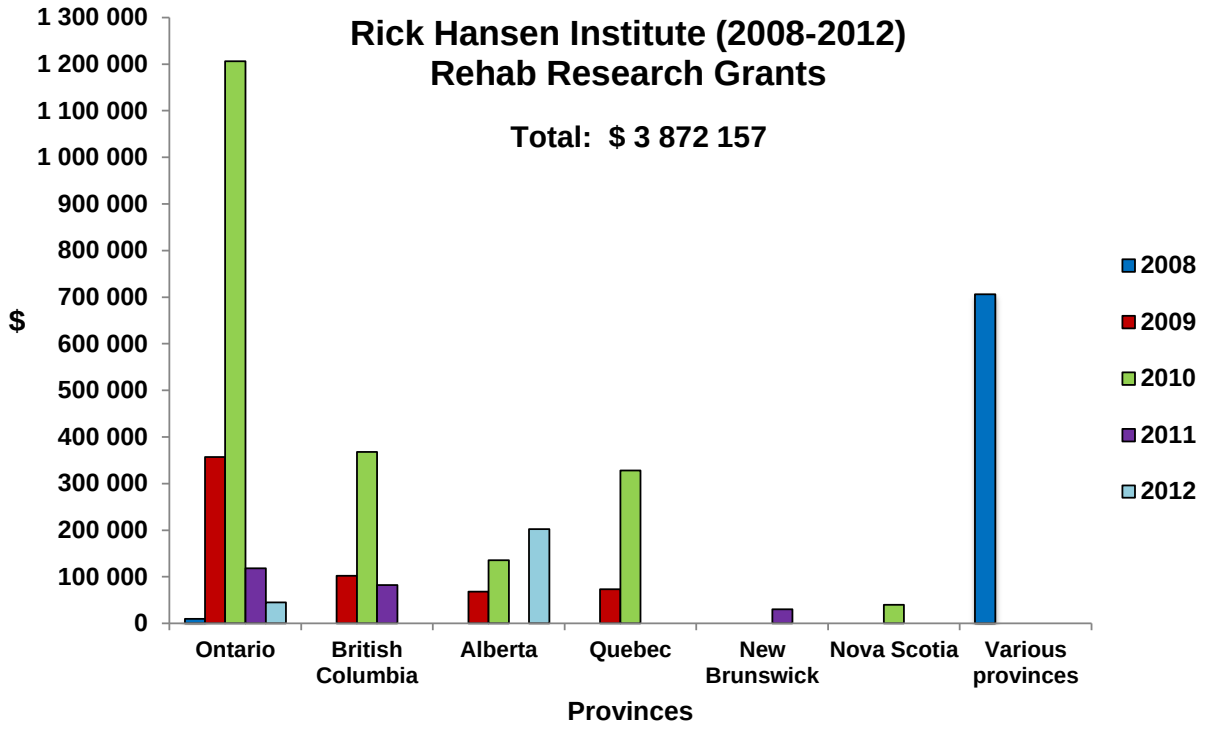
From 2001-2011, the MSFHR awarded a grand total of $12,189,906 to rehabilitation research, the majority of which went to career grants, studentships and post-doctoral fellows. The amount awarded increased gradually from 2001 to the year 2008-2009 after which the amount started to decline.

Sources
Data for MSFHR was provided by:
Sarah Arnold, Impact Analysis

3.2. Rick Hansen Institute (RHI)

The RHI, founded in 1986 after Rick Hansen's historic trip around the world to raise funds for research related to spinal cord injuries, is located in Vancouver and affiliated with the University of British Columbia. It allocates research funding to researchers in many provinces. The graph below and accompanying note of explanation were provided by the RHI.

Figure 23. Contributions of Rick Hansen Institute to Rehabilitation Research Grants



The graph reports both complete and committed grants (a total $ 3 872 157) by RHI from 2008-2012. It does not include grants which may have a rehab research component such as Ontario Government funding directed through the Institute to Ontario Neurotrauma Foundation, Alberta Government funding directed through the Institute to Alberta Paraplegic Foundation, awards for researcher development, awards to the practice networks (PN's) or research management team (RMT), awards for access to clinical trials through Wheels in Motion and the recent Access to Care and Timing grant. It also does not include RHI contracts that may have a rehab research component such as work with Accreditation Canada or Knowledge Mobilisation Network or grants related to the RHSCIR (Registry).

Given the distribution of RHI funds to different provinces, RHI funds were not included in the British Columbia provincial funds, nor in the summary of total funds for Canada.

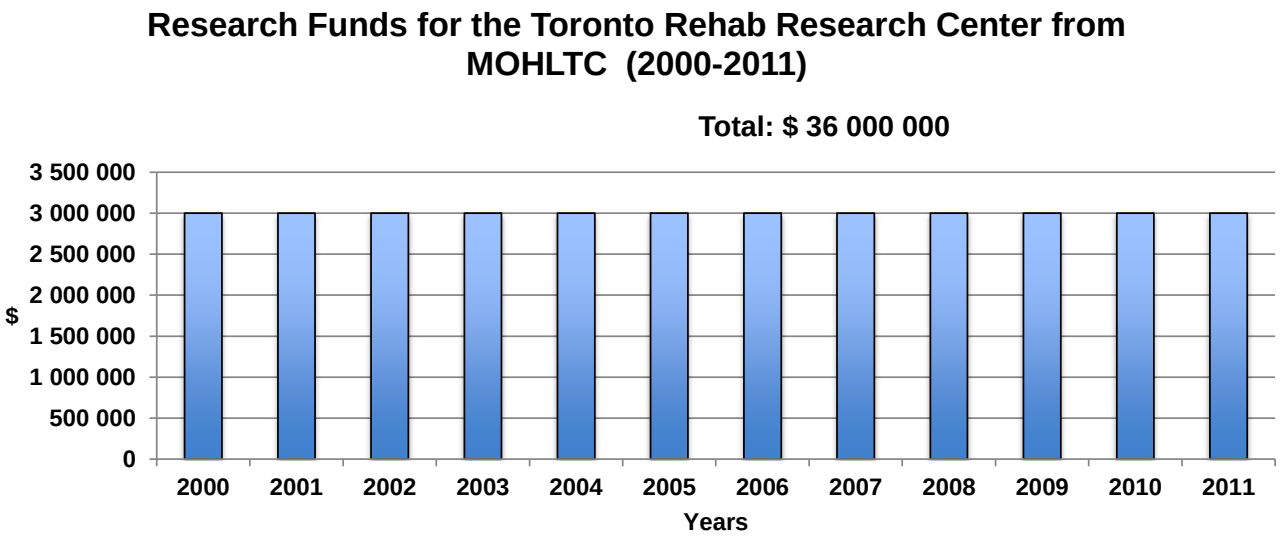
Sources
Data for the RHI was provided by :
Bill Barrable, Chief Executive Officer

4. Ontario

4.1. Toronto Rehab Institute

Funds available for research (2000-2011)

Figure 24. Research Funds for the Toronto Rehab Research Center from MOHLTC



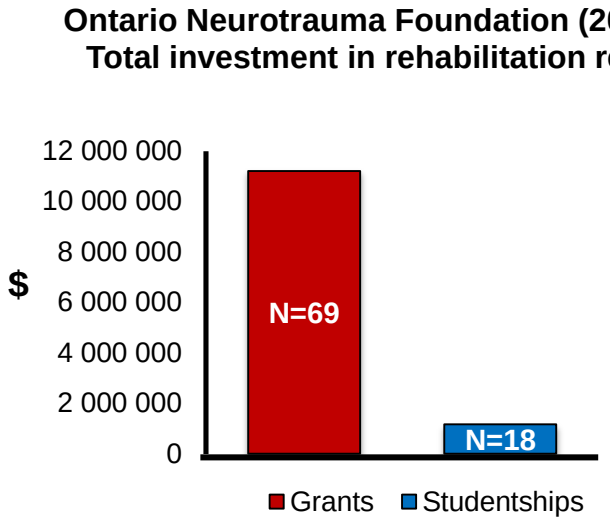
Sources:

Ms Bridgette Murphy, of the TRI requested information from the Ontario Ministry of Health concerning funding for rehabilitation research in Ontario.

Ms. Deborah VanOosten, Senior Research Planning/Advisor in the Research Unit of the Health System Strategy Branch, confirmed that Toronto Rehab and ONF funding are the two main (provincial) investments in rehabilitation research. There is apparently no central tracking of funds allotted for rehabilitation research across the Ministries. Research funding to ONF and Toronto Rehab are managed by the Ministry of Health Research Unit.

4.2. Ontario Neurotrauma Foundation (ONF)

Figure 25. ONF. Total Investment in Rehabilitation Research



The ONF awarded a grand total of $12,373,924 to rehabilitation research. Of this amount, most went to fund 69 research grants and the remainder to fund 18 studentships. Yearly awards were not available.

Sources:

M. Kent Basset-Spiers, Chief Executive Officer

Summary of funds available from the Province of Ontario:

The data describing available funds for rehabilitation research in Ontario represents the information that we could obtain. There is apparently no central tracking of funds allotted for rehabilitation research across the Ministries. Research funding to ONF and Toronto Rehab are managed by the Ministry of Health Research Unit. Ms. Deborah VanOosten, Senior Research Planning/Advisor in the Research Unit of the Health System Strategy Branch, confirmed that Toronto Rehab and ONF funding are the two main (provincial) investments in rehabilitation research.

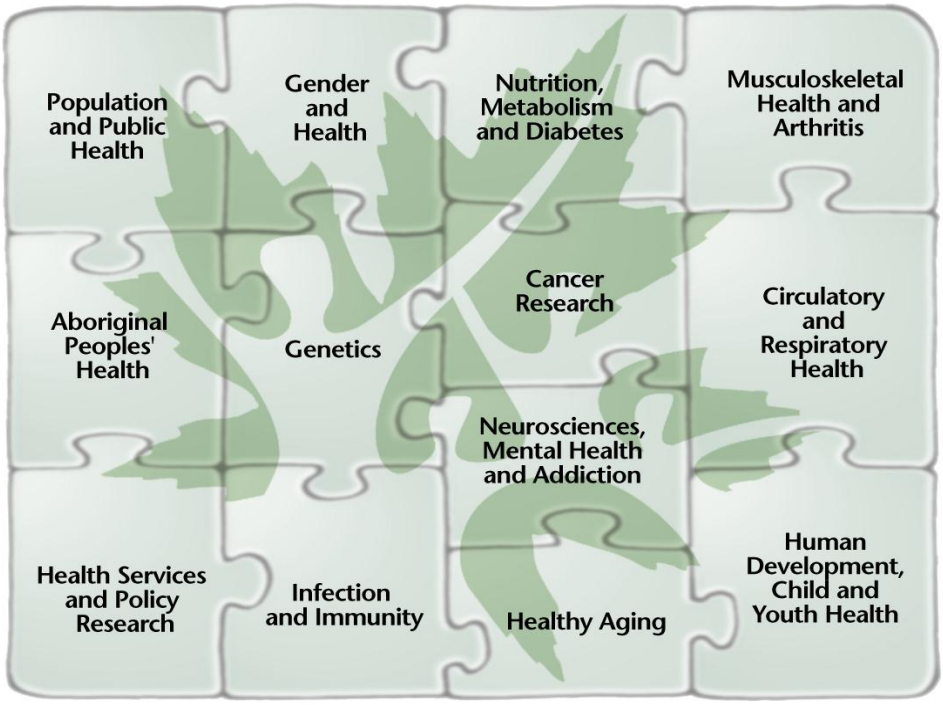
5. Federal granting agencies

5.1. Canadian Institutes of Health Research (CIHR)

The Canadian Institutes of Health Research (CIHR) is the Government of Canada's agency responsible for funding health research in Canada. CIHR was created in 2000 under the authority of the *CIHR Act* and reports to Parliament through the Minister of Health. CIHR's budget for 2008-09 was $928.6 million, of which $132 million was allocated to administering the Networks of Centres of Excellence and Canada Research Chair programs.

CIHR consists of 13 "virtual" institutes (see figure below), a structure that is unique in the world. These innovative institutes bring together all partners in the research process – the people who fund research, those who carry it out and those who use its results – to share ideas and focus on what Canadians need: good health and the means to prevent disease and fight it when it happens. Each institute supports a broad spectrum of research in its topic areas and, in consultation with its stakeholders, sets priorities for research in those areas.

Figure 26. The 13 Constituent Institutes of the CIHR. The 13 Institutes that of the CIHR



Most of CIHR's Institutes potentially have funding initiatives related to Rehabilitation, but the Institute recognized as the flag bearer for Rehabilitation research is the Institute for Musculoskeletal Health and Arthritis (IMHA). In addition, some CIHR research panels relate to different aspects of the rehabilitation research continuum.

Methodology used to mine the CIHR database

Access to the CIHR database was provided by Dr Jane Aubin the Scientific Director of the Institute for Musculoskeletal Health and Arthritis (IMHA) when this scan was initiated, Dr Aubin later became Vice-President for Research of the CIHR.

To interrogate the data base, we worked with the CIHR staff and in particular, Mr. Jamie Ruszkowski, to determine keywords and to narrow down the data required. Multiple keywords in English and French (n= 244) were provided to the data branch and all CIHR funded projects to date, including their titles, key terms, and abstracts were scanned for matches. The keywords contained words that might identify projects related to rehabilitation. This led to the identification of 5259 projects as having at least one of the keywords, or having at least one word containing part of a keyword. A number of these projects were already coded as related to MSK rehabilitation by IMHA as part of previous validations.

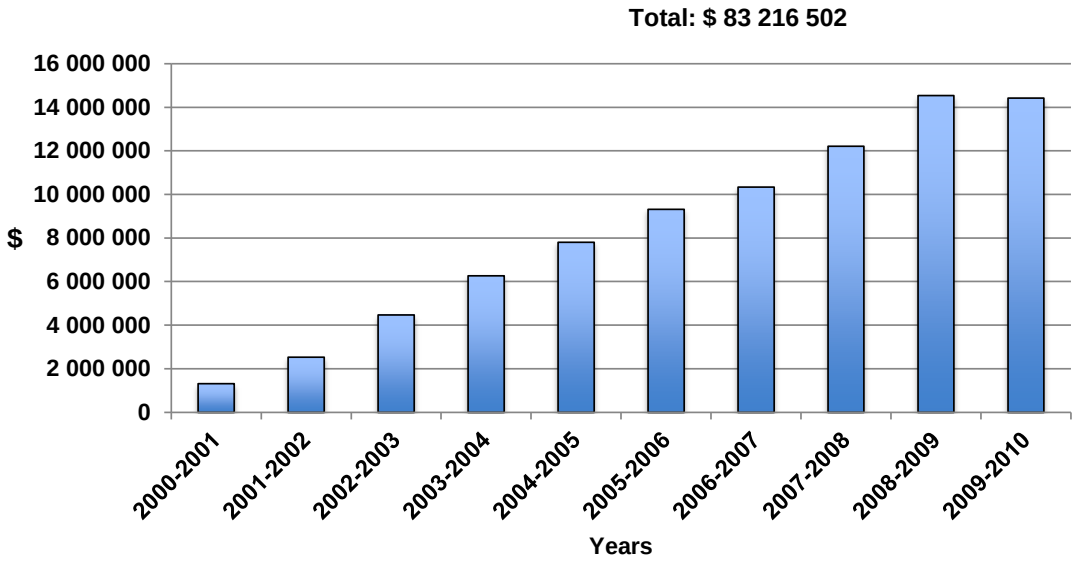
For the remaining projects a manual validation was conducted and each project was categorized as related to rehabilitation or not using the below operational definition. Further, research projects were categorized as associated to MSK, cardiac, and/or CNS (central nervous system) rehabilitation, as well as an "other" category.

CIHR operational definition of rehabilitation

A rehabilitation project was defined as research dealing with re-establishing /improving/recovering MSK or brain/CNS abilities and functioning, or cardiac capabilities closer to those observed prior to a type of disablement produced by accident, disease onset, or other conditions unrelated to congenital diseases or disorders (e.g., individuals born with genetic developmental diseases generally do not go through "rehabilitation", although research might deal, for example, with improving the quality of life or access to care in this population, etc.). The definition also excludes those projects that did not directly examine rehabilitation, despite research results reported as potentially having implications for rehabilitation. Although this group of research projects might be important to capture in the context of rehabilitation, not all researchers discuss the implications of their research in their abstract description, thus including all projects with a potential for rehabilitation effects would not be possible based on the current data set, hence the use of the more focused definition.

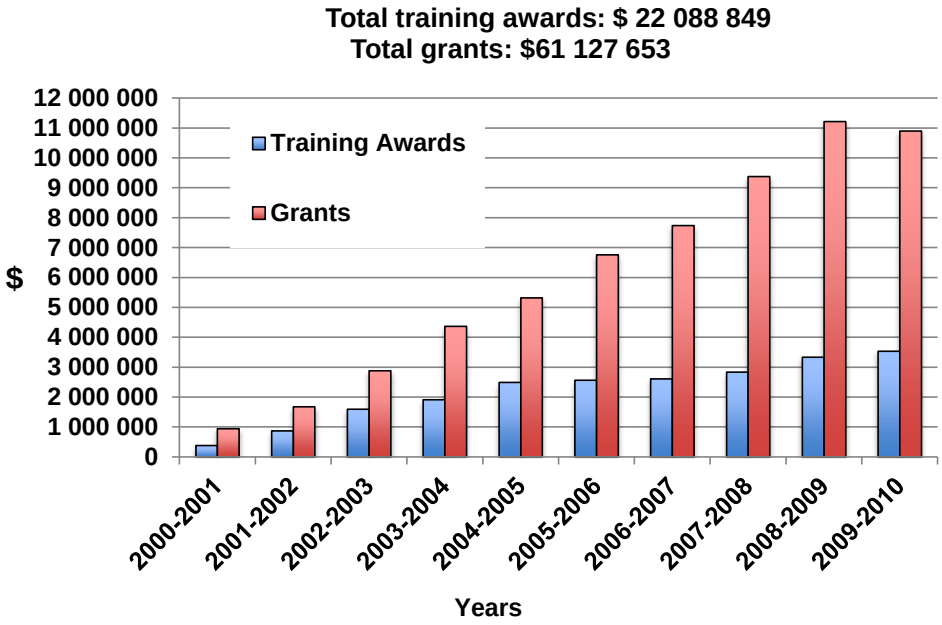
MSK-related research generally deals with rehabilitation of MSK functions (including oral or head related), while cardiac–related research generally includes those projects dealing with cardiac rehabilitation following an infarct. Finally, in the area of CNS/ brain rehabilitation, mood disorders or psychiatric conditions were not necessarily considered as disabilities subject to rehabilitation (mood disorder/psychiatric treatments are generally not considered or labeled by researchers as a form of "rehabilitation") in the absence of MSK, CNS/cognitive, or cardiac disablement. CNS/brain rehabilitation related to damage produced by any of the aforementioned conditions, including stroke or other acute conditions impacting the functioning of the brain, including but not limited to memory, motor, or other impairments were included. Substance abuse rehabilitation was not the focus of this search and was not included. In 2010 a total, 586 of the 5259 identified projects were categorized as being related to rehabilitation research.

Figure 27. CIHR Expenditures in Rehabilitation Research in Grants and Awards combined (2000-2001 to 2009-2010)



This figure illustrates the gradual increase in expenditures from the year 2000-2001 to 2008-2009 followed by a small decrease.

Figure 28. CIHR: 2000-2010: Total rehabilitation expenditures by type (training awards versus grants)



This graph illustrates CIHR`s much greater proportional investment in grants than training awards up to 2008-2009. In 2009-2010, the amount for grants decreased while that for training awards rose somewhat.

In summary, between 2000 and 2010 CIHR spent 83 M $ in rehabilitation research (22 M $ in training awards and 61M $ in grants), with a total of 96 M $ when including the amounts committed post-2010. The most funding is allocated to MSK-related rehabilitation, followed by CNS-related rehabilitation, with little funding in cardiac rehabilitation. These patterns are maintained in spending for grants and awards, with more funding allocated to the former type of program.

Table 4: Funding and success rates at CIHR IMHA-relevant Rehabilitation

IMHA-relevant Rehabilitation	**2000-2001**	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**	**2005-2006**	**2006-2007**	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**
Core Funding Rate	83,3 %	61,9 %	66,7 %	75,0 %	62,1 %	50,0 %	38,9 %	63,2 %	29,4 %	45,0 %	54,5 %
Overall Funding Rate	100%	85,7 %	75,0 %	81,3 %	65,5 %	60,0 %	44,4 %	68,4 %	58,8 %	50,0 %	54,5 %
Core Success Rate	26,3 %	27,1 %	23,9 %	25,5 %	35,3 %	20,0 %	20,6 %	37,5 %	19,2 %	23,1 %	28,6 %
Overall Success Rate	34,2 %	37,5 %	28,4 %	27,7 %	37,3 %	24,0 %	25,0 %	42,2 %	38,5 %	25,6 %	28,6 %

These statistics from the IMHA data bank shows an overall success rate for rehabilitation research that oscillates from a high of 42.2% (2007-2008) to a low of 24% (2005-2006). The success rates for the last 2 years were 25.6 and 28.6, respectively. The overall funding rate, however, has been lower in the last 5 years than the previous 5, with a funding rate of 50 and 50.4%, respectively, the last 2 years.

Core success rate = # core approved / # received
Overall success rate = (# core approved + # other approved (no double counting of applications)) / #received
Core funding rate = # core applications that received any funding / # fundable applications
Overall funding rate = # applications that received any funding / # fundable applications

Success Rate: Demonstrates the probability of being approved for funding when submitting an application in that competition. It shows the fraction of the applications approved for funding out of the entire pool of applications received (i.e. ratio how many applications were approved for funding). One thing to keep in mind here is that “approved for funding” does not mean they were funded. The applicant can turn down funding, or it may be terminated by CIHR for other reasons.

Funding Rate: Is somewhat a measurement of the excellence of the applications received by CIHR. It shows the ratio of how many applications were approved for funding out of the number of applications that were deemed fundable (scored >=3.5 by the PRC). An application has to meet a certain standard of excellence as determined by the PRCs. The pool of applications is thus smaller than the success rate. It also shows us information on the availability of funds through CIHR, as anything we deem as fundable should theoretically be funded. But there are only so many funding dollars available. The funding rate shows how much of the excellent research can be supported through CIHR.
Fundable applications have a rating of 3.5 or greater. In 2000-2003, there were a few applications with ratings 3.0-3.4 that were approved, which gives slightly inflated funding rates in some circumstances.

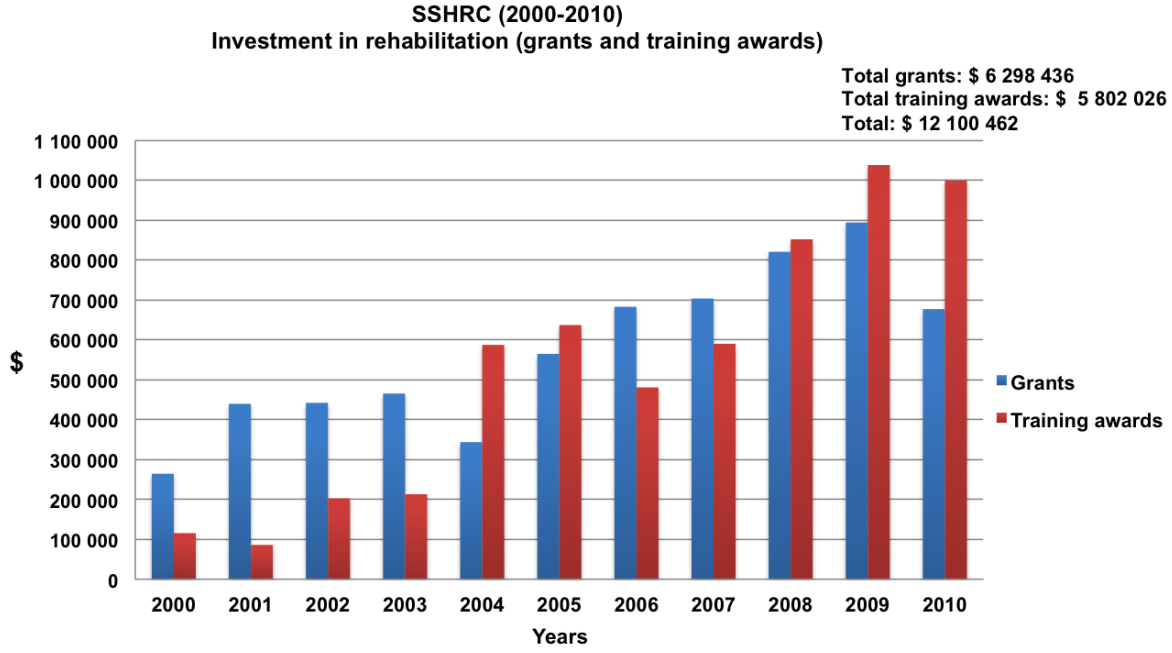
Note on data gathering for CIHR

Dr Jane Aubin, then Scientific Director of IMHA and now Vice-President for Research at CIHR graciously requested a search of the CIHR data bank for this report. The search was based on an operational definition of rehabilitation followed by a keyword search. The data provided on rehabilitation research covers all of the CIHR programs.

The data on funding rates was provided by:
- Liz Stirling, Assistant Director, Institute of Musculoskeletal Health and Arthritis
- Marc R. Milot, PhD Analysis & Evaluation Unit, Institute of Musculoskeletal Health and Arthritis (IMHA)
- Jamie Ruszkowski, Data Production Specialist

5.2 Social Sciences and Humanities Research Council of Canada (SSHRC)

Figure 29: SSHRC Investment in Rehabilitation Research over the years



SSHRC does not have information on personal salary awards. Since the 2009 Federal budget, SSHRC funding is reduced for health-related research that is eligible under the mandate of CIHR.

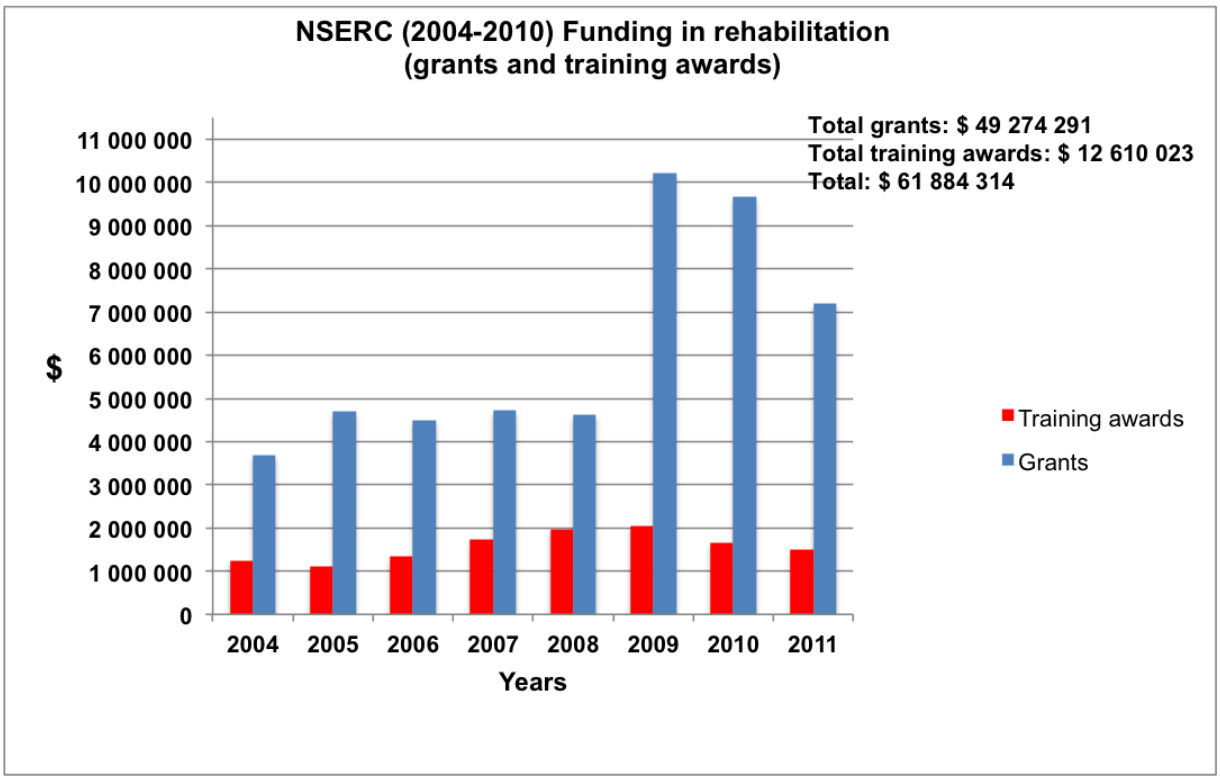
Note on data gathering for SSHRC

Julia Gualtieri, Media Relations Advisor, Communications Division

Data was compiled by SSHRC corporate statistics division using the following keywords from SSHRC's Award Search Engine : rehabilitate or réadaptation or déficience and physique or impair and hearing or impair and speech or impair and lang or impair and motor or impair and visual or déficience and auditive or déficience and langage or déficience and parole or déficience and motrice ou déficience and visuelle. After reception of the file, the word «disability» was added to complete the file provided by SSHRC. Results from research were then gathered; Double entries were excluded and total amount were calculated for each year.http://www.outil.ost.uqam.ca/CRSH/RechProj.aspx?vLangue=Anglais

5.3 Natural Sciences and Engineering Research Council of Canada (NSERC-CRSNG)

Figure 30. NSERC Investments in Rehabilitation over the years

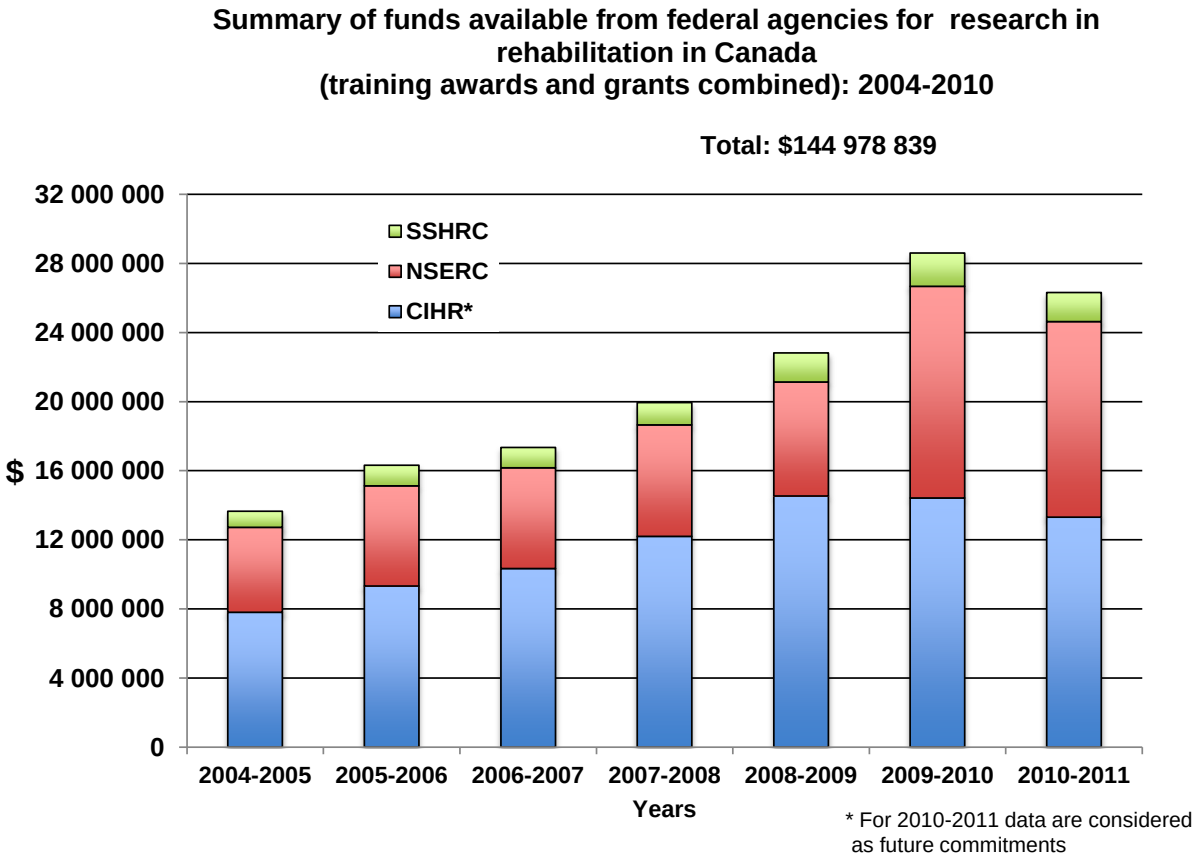


Note on data gathering
Source: Barney Laciak, Manager, Corporate Planning

Search was conducted by NSERC using the following key words and department names
Key words: disability, impairment and rehabilitation.
Department: kinesiology, physiotherapy and rehabilitation.

Summary of funds from CIHR, SSHRC and NSERC

Figure 31. Summary of Investment in Rehabilitation research by the three Federal Agencies (2004-2005 to 2010-2011)



The funding profile only covers the years 2004-2005 to 2010-2011 because these were the years with information available from all 3 agencies.

5.4. Centers of Excellence

5.4.1. NeuroDevNet,

NeuroDevNet, a Canadian Network of Centres of Excellence (NCE) created in 2009, is dedicated to helping children overcome neurodevelopmental disorders. Network investigators seek to understand the causes of neurological deficits, and to transfer this knowledge to health care professionals, policy makers, and communities of interest. NeuroDevNet works with its partners in academia, the community, not-for-profit sector, industry, and government, and across traditional disciplinary boundaries and sectors, to ensure generated knowledge is translated into tangible diagnostic, preventative, therapeutic, social, economic, and health benefits for all.

NeuroDevNet supports transformative research, provides training to build a new generation of Canadian researchers, strengthens communities with the right tools and information, and translates research findings into early diagnostic, preventative, and therapeutic strategies for children with neurological disorders to live healthier lives. Currently, the network's research focuses on autism spectrum disorder, cerebral palsy, and fetal alcohol spectrum disorder. These demonstration projects are supported by NeuroDevNet's central infrastructure and cores, including Neuroethics, Neuroinformatics, and Knowledge Translation.

Figure 32. NeuroDevNet: CP Demonstration Project

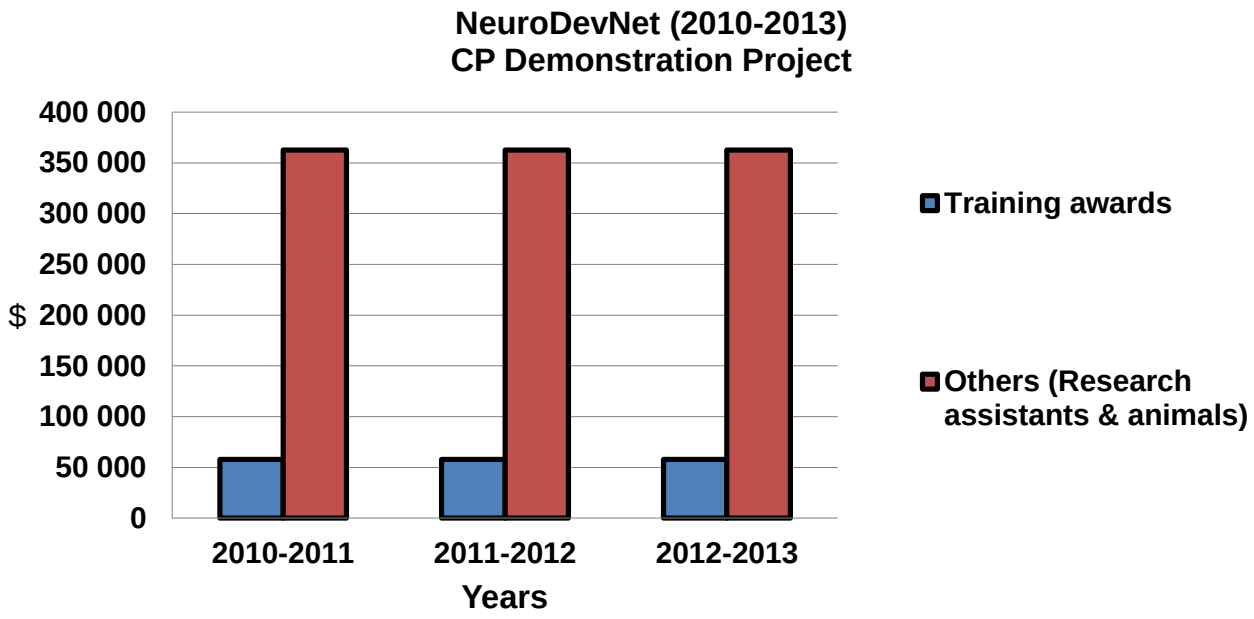
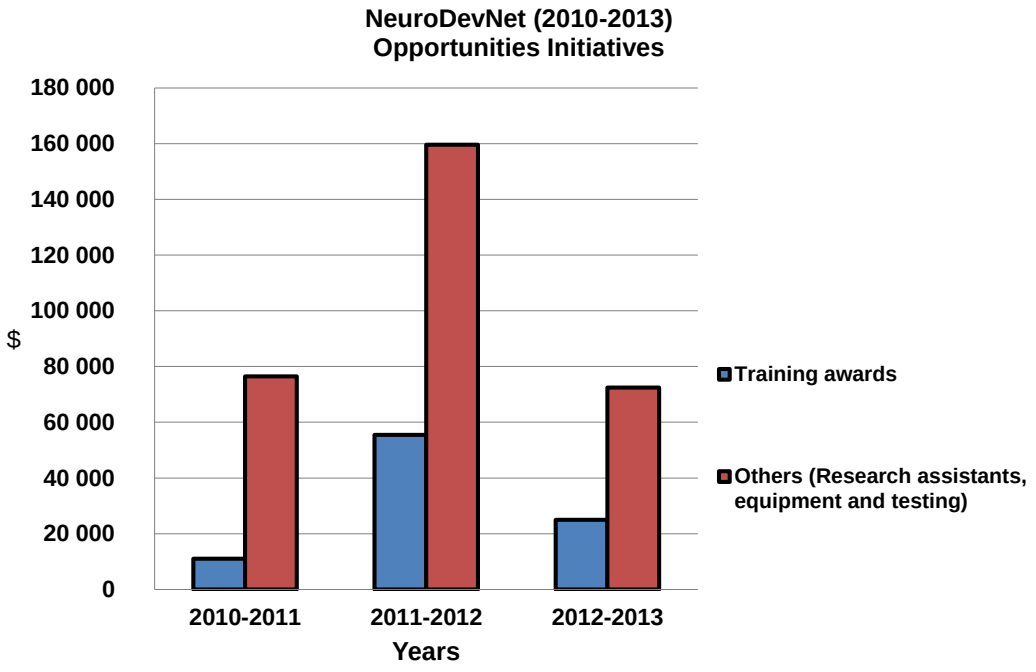


Figure 33. NeuroDevNet: Opportunities Initiatives



NeuroDevNet invested a total of 1,661,500 $ for rehabilitation research ((CP Demonstration and Opportunities Initiatives) over 3 years.

Sources

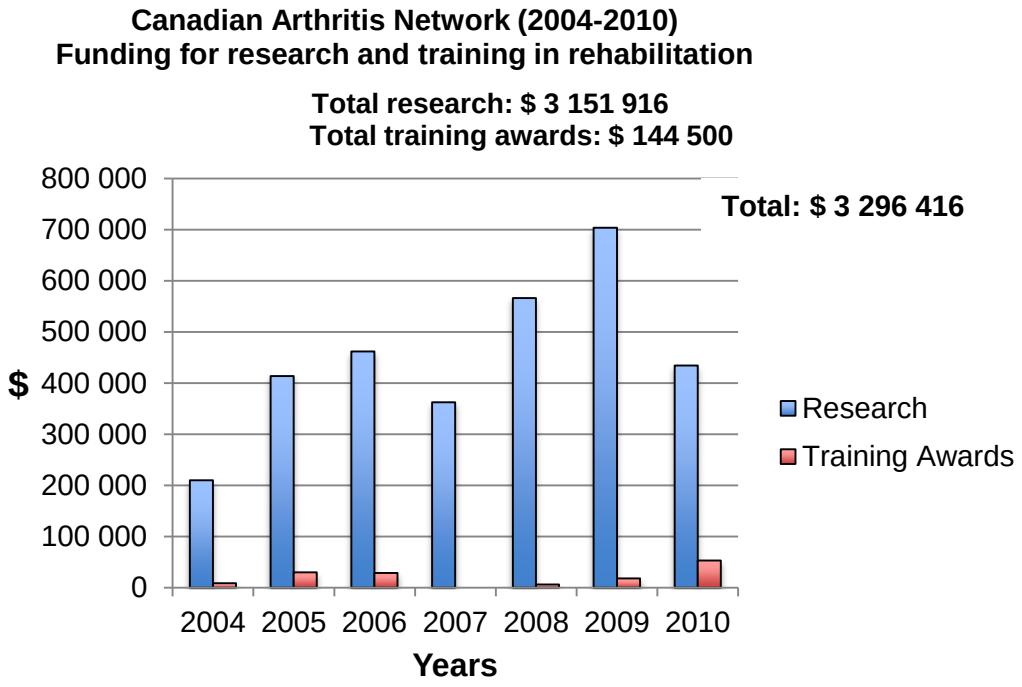
Data for NeuroDevNet was provided by:

- Dr. Daniel Goldowitz, Scientific Director
- Bruno Graziotto, Financial Administrato.

5.4.2 Canadian Arthritis Network (CAN) [3]

Canadian Arthritis Network (CAN) is a not-for-profit organization that supports integrated, trans-disciplinary research and development. CAN is the single point of contact that links nearly 200 leading Canadian arthritis researchers and clinicians, 45 Canadian academic institutions, The Arthritis Society, the Canadian Institutes of Health Research's Institute of Musculoskeletal Health and Arthritis, pharmaceutical and biotechnology companies, and government. The Network funds research and acts as a facilitator, bringing scientific discoveries to market by providing access to cutting-edge techniques for product development and evaluation. It offers pre-clinical and clinical research services, and facilitates technology transfer and the commercialization of new discoveries. CAN is a member of the federal Networks of Centres of Excellence, Canada's flagship science and technology program.

Figure 34. Investments in Rehabilitation Research by the Canadian Arthritis Network



Graph illustrates CAN funds awarded to Network Investigators with rehabilitation backgrounds involved in research projects and funds awarded to trainees funded with supervisors that are CAN Network Investigators with rehabilitation backgrounds.

Sources

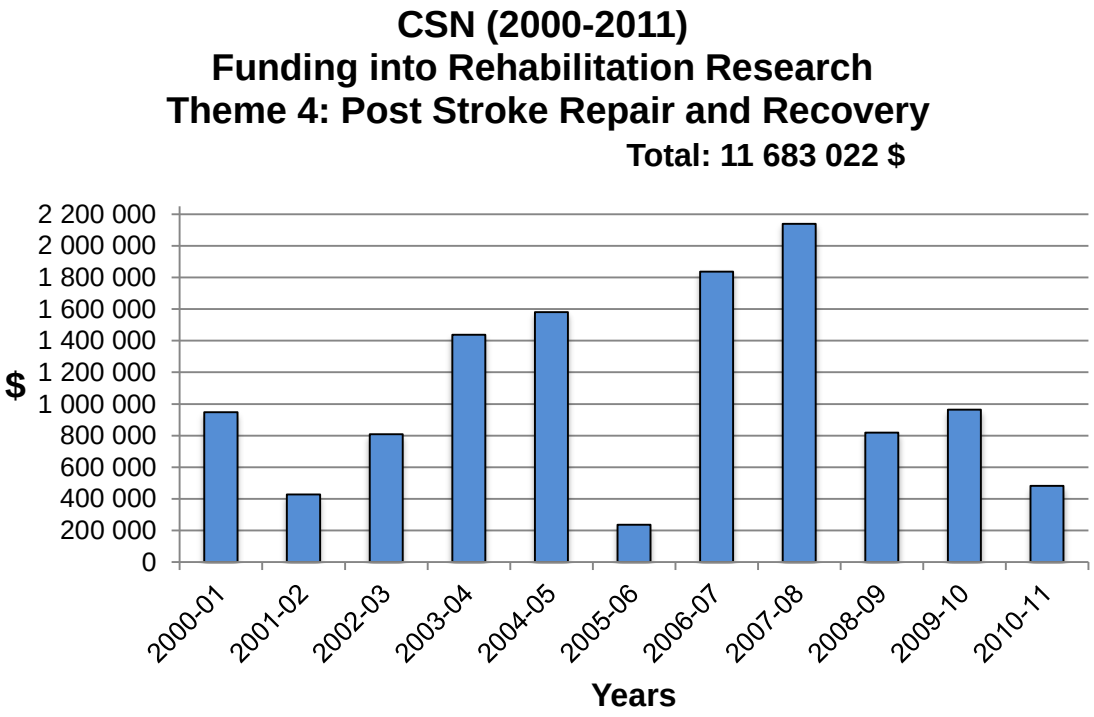
Data for Canadian Arthritis Network was provided by:
Dr. Kate Lee, CAN's Managing Director

[3] Having reached the end of its 14 years of funding from the Networks of Centres of Excellence, CAN closed its R&D activities on March 31, 2012 and began it's two-year chapter focused on knowledge transfer and exchange (KTE). CAN's KTE aims are to find mechanisms to sustain its most valued programs and to share its successes during its 14 years of existence.

5.4.3 The Canadian Stroke Network

The Canadian Stroke Network of Excellence brings together researchers, students, government, industry and the non-profit sector. At present, the Network has more than 100 researchers at 24 universities across the country. It was created in 1999 with $4.7 million in seed funding from the federal government and is a not-for-profit corporation, governed by a Board of Directors and headquartered at the University of Ottawa. The Network puts Canada at the forefront of stroke research through its multi-disciplinary research program, high-quality training for Canadian scientists and clinicians, and national and global partnerships. The Canadian Stroke Network is dedicated to decreasing the physical, social and economic consequences of stroke on the individual and on society. Its researchers who are members of the Rehabilitation Theme hare known for their leadership in large knowledge translation-type of projects and their work greatly contributed to the Canadian Stroke Strategy and best practices in the rehabilitation of stroke.

Figure 35. Investments in Rehabilitation Research by the CSN



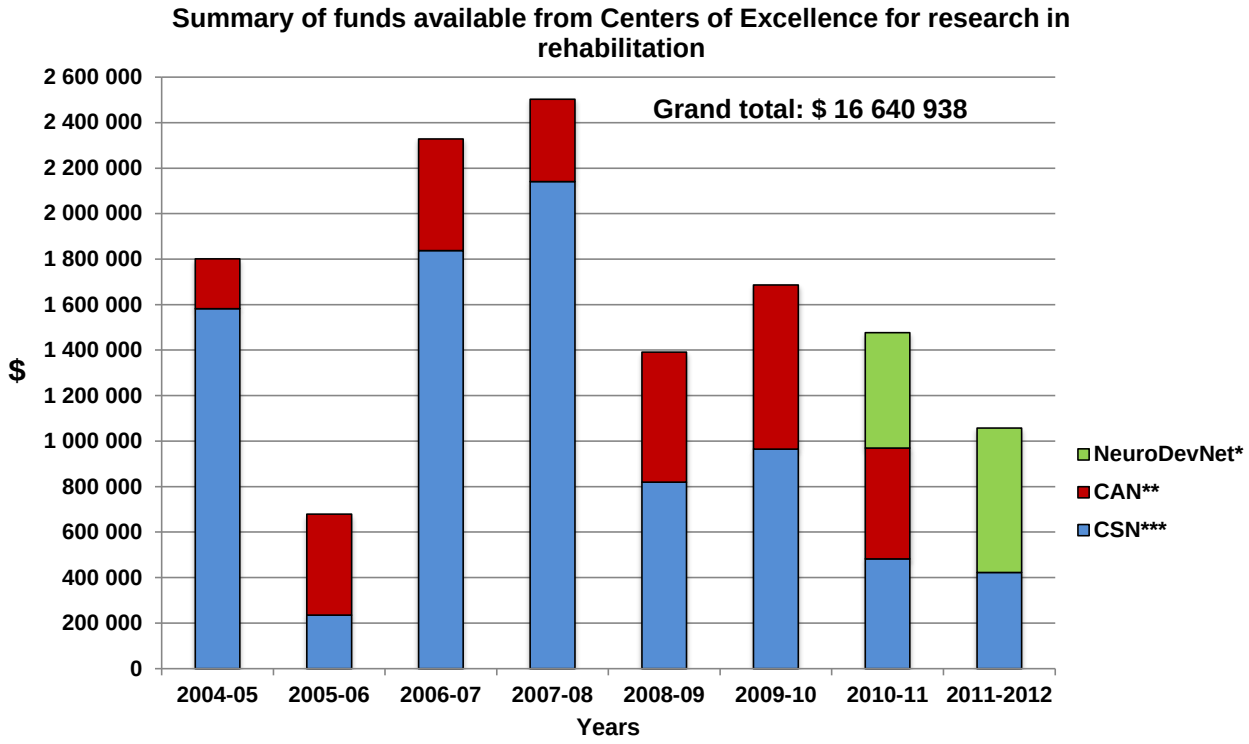
Please note that this is only research. CSN accounts for HQP separately – into specific training budgets. Unfortunately, HQP is not tracked by theme & is mostly managed by the Heart & Stroke Foundation of Canada (through the Focus on Stroke program).

Source

Data for CSN was provided by:
Katie Lafferty, Executive Director

Summary of Investments in Rehabilitation Research by the 3 Centers of Excellence

Figure 36. Summary of Investments in Rehabilitation Research by the 3 Centers of Excellence



Notes :

*NeuroDevNet was created in 2009. Funds comprise CP Demonstration Project & Opportunities Initiatives

**CAN: Research and Training awards. No data for 2011-2012

***CSN: Funds comprise research only on Theme IV: Post Stroke Repair and Recovery

5.5. Foundations

5.5.1. The Heart and Stroke Foundation (HSF) of Canada

Since 2010, the HSF has provided support close to $13 M to support stroke rehabilitation research. Importantly, this amount does not include what the provinces may have provided in the area of stroke rehabilitation given the estimated figure contains only those managed by the national office in Ottawa (or those made since 01 September 2011). As of 01 September 2011, the HSF became one organization, replacing the previous traditional federated model.

Other information that may be of interest:

HSF Centre for Stroke Recovery: http://centreforstrokerecovery.ca/about-us/structure
Consensus Panel: http://www.heartandstroke.on.ca/atf/cf/%7B33C6FA68-B56B-4760-ABC6-85B2D02EE71%7D/SRSCP_FULL_REPORT_FINAL20070430%5B1%5D.pdf
Resource Guide: http://www.heartandstroke.on.ca/atf/cf/%7B33C6FA68-B56B-4760-ABC6-D85B2D02EE71%7D/RehabResourceGuide20070928FINAL.pdf

Source of data

Data for the Heart and Stroke Foundation was provided by:

- Mme Christine Legrand, Health Policy Department

5.6. Research Chairs related to Research in Rehabilitation

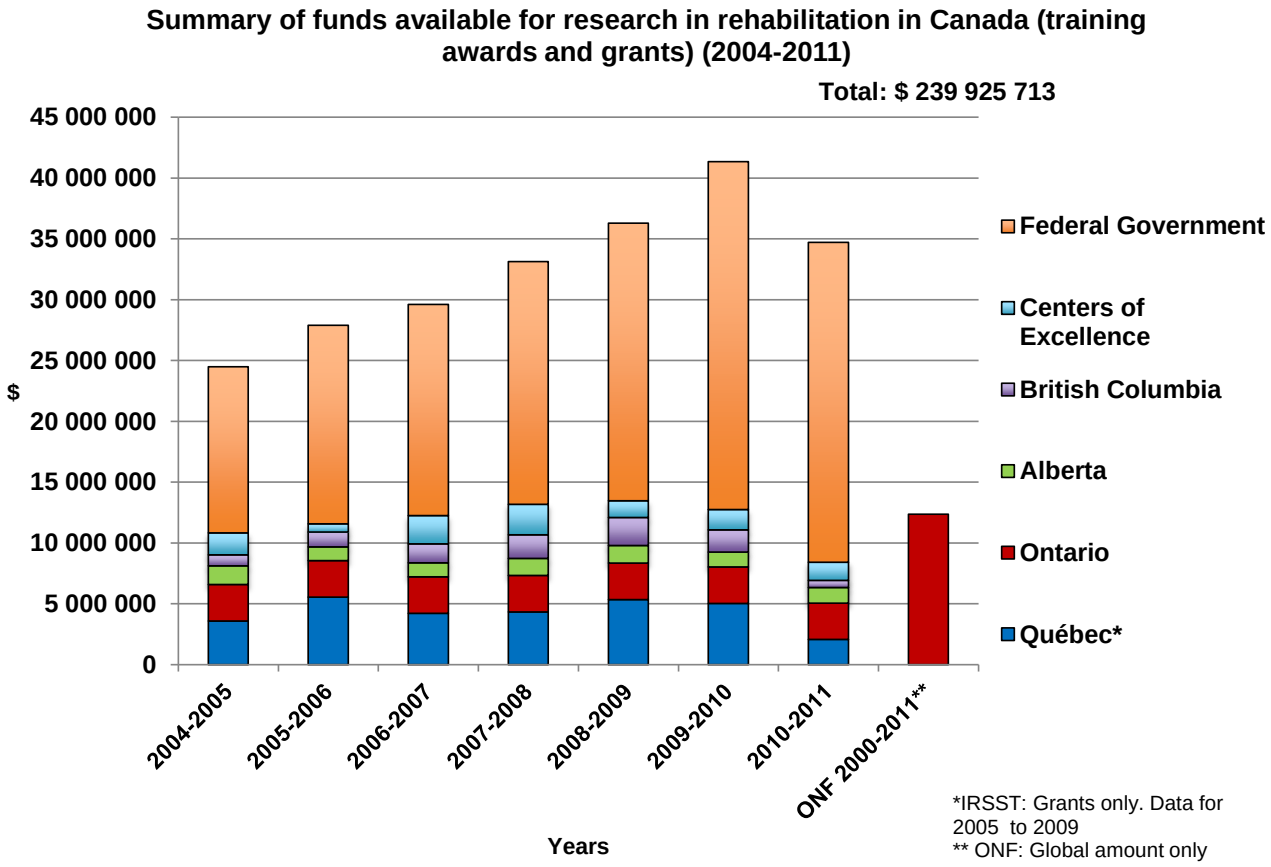
An e-mail survey of Directors of Rehabilitation University Programs in Canada revealed that a total of 28 Research Chairs were either held by individuals involved in rehabilitation research or were in the process of development in 9 Universities.

A total of 28 Research Chairs were identified:

Canada Research Chairs (CRC) n=13
University Chairs = 4
Private Chairs (name of a donor or foundation) n=11

In the Province of Quebec:
5 Canada Research Chairs
5 Private Chairs
Other Provinces:
8 Canada Research Chairs
10 Private Chairs

Figure 37. Summary of Funds Available from Federal and Provincial Sources



Note: ONF: Global amount only.

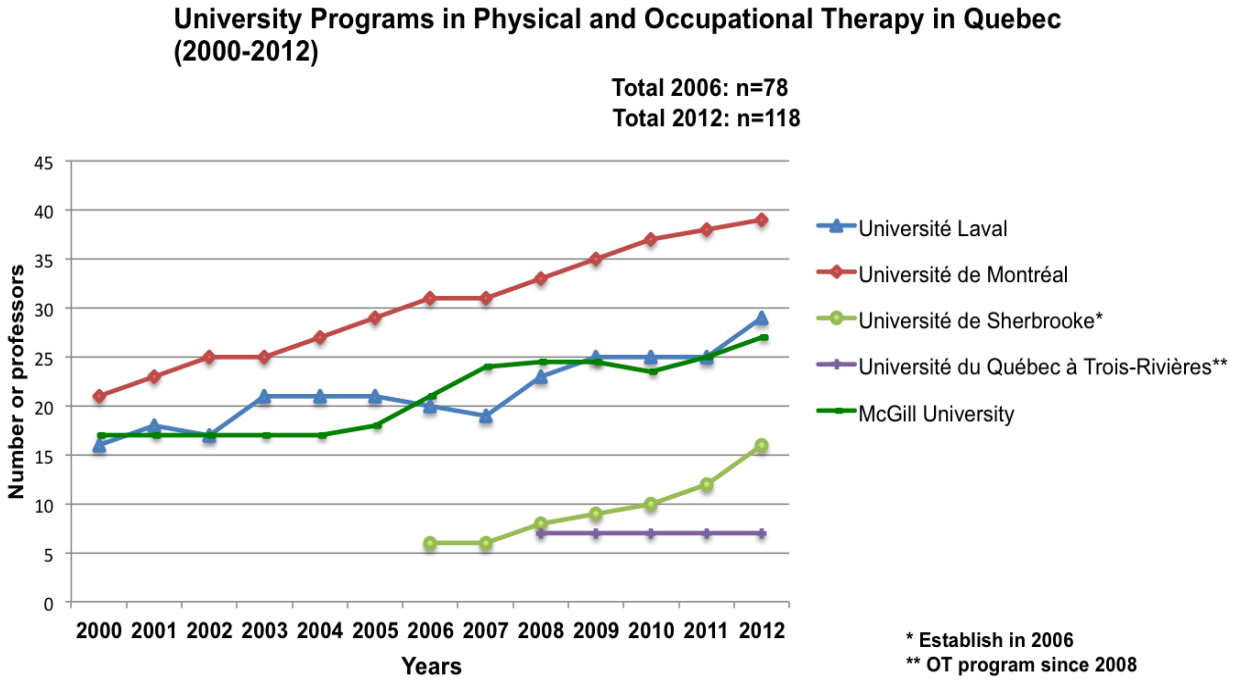
From 2004-2011 an estimated $ 239 925 713 was allocated to research (grants and awards) from major federal and provincial (Quebec, Ontario, Alberta and British Columbia) sources.

6. Researchers involved in rehabilitation research

Documenting the evolution of the number of researchers in the field of rehabilitation is a challenge because of the multidisciplinary nature of the field and the large number of disciplines that can be involved in research projects that span the rehabilitation continuum. In this report we attempted to arrive at a reasonable estimate by examining data from a number of sources: the granting agencies that kept data on the number and source of applications, websites describing University Programs, e-mails to the Directors of traditional University Programs and personal phone calls and meetings with key players in different provinces.

6.1 Quebec

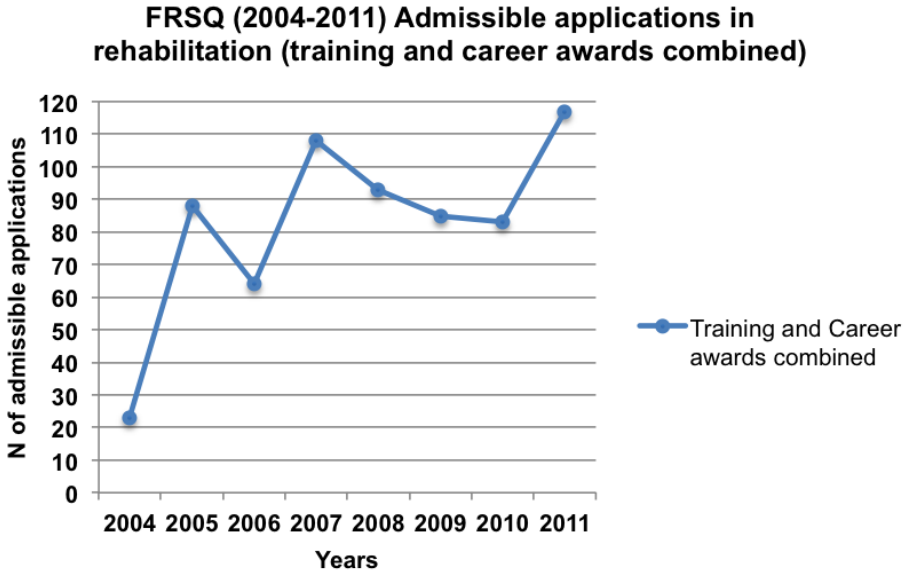
Figure 38. University Programs in Physical and Occupational Therapy



Information obtained from the University Programs. Université de Sherbrooke initiated their programs in 2006 while UQTR started a Program in Occupational therapy in 2008. The total number of University Professors in Physical and Occupational Therapy has increased from 54 in the year 2000, to 118 in 2012 an increase of 118,5%, more than double the number in the year 2000. In the 3 oldest Universities offering PT and OT programs, the increase in PT and OT Professors increased from 55 in 2000 to 93 in 2012, an increase of 69%.

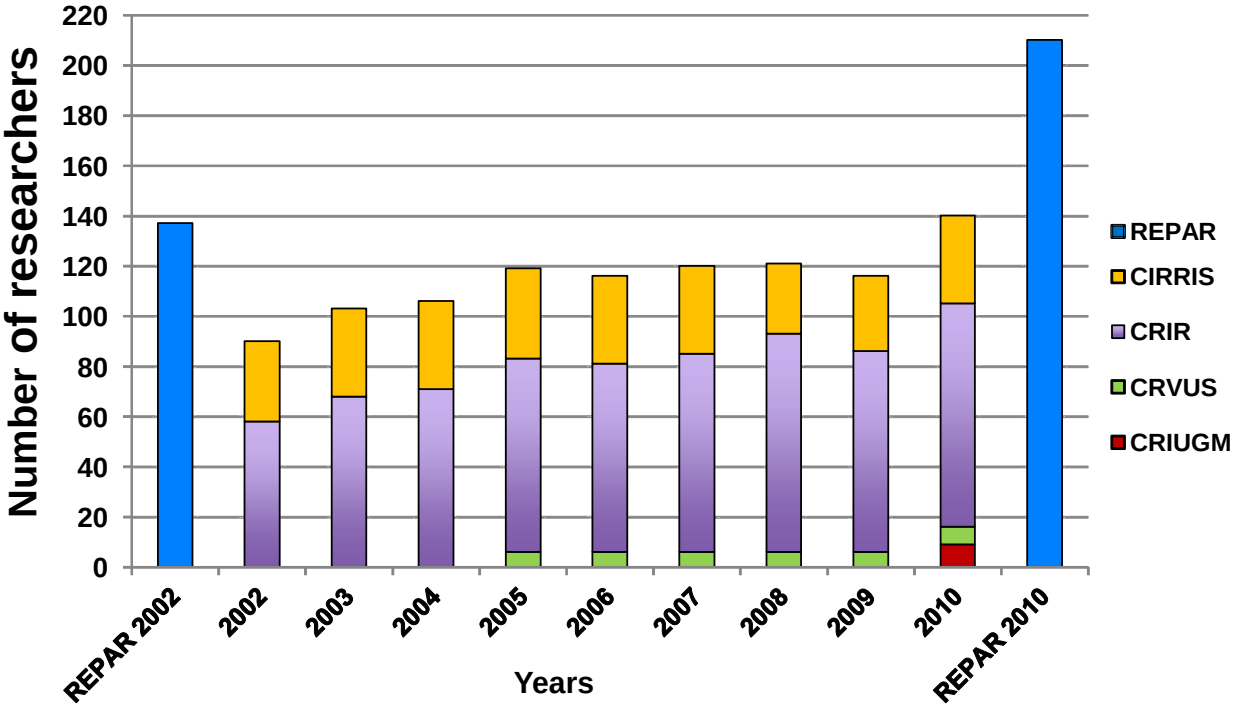
If the number of Professors in Speech Pathology and Audiology are included, the number of professors the University Rehabilitation Programs in the Province of Quebec increased from 68 (3 Universities) in 2000 to 141 (5 Universities) in 2012, an increase of 107%, indicating **more than double** the number in 2012 and reflecting the increased enrollment in Rehabilitation Programs across the Province in the last few years.

Figure 39. Admissible admissions to FRSQ training and career awards Programs



The data shows marked variations in the number of admissible candidates in rehabilitation applying for training and career awards to the FRSQ over the years. After a peak of 108 applications in 2007, the number fell to 83 in 2010 to rise again to 117 in 2011, representing an increase of **387% (3.9 fold) from the 23 in 2004.**

Figure 40. Estimate of the number of researchers involved in rehabilitation research in Quebec 2002-2010.



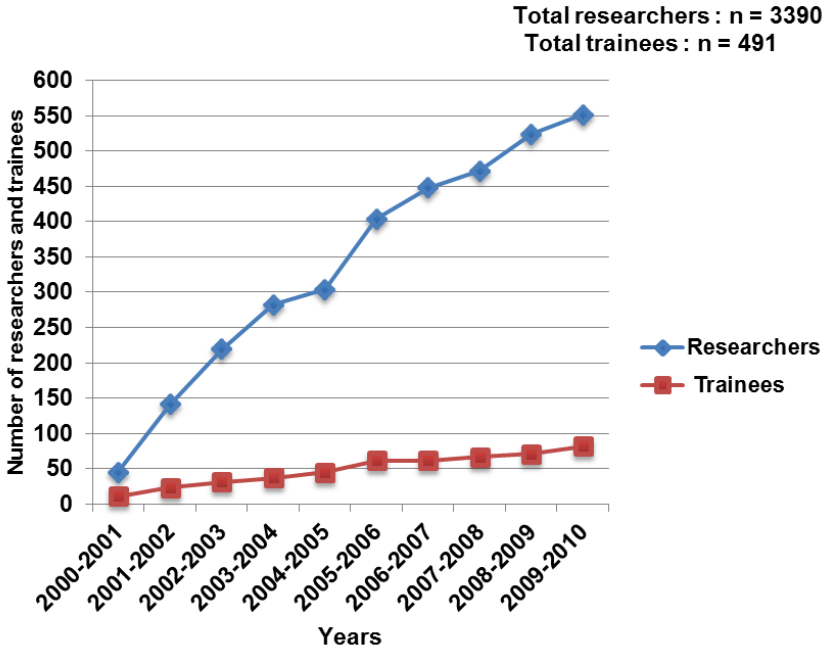
By comparing the difference between information obtained from the 4 research centers (although have missing data) and that obtained from the Research Network (REPAR), one can see that in 2002, there were 47 more researchers in REPAR than in the 2 research centers with data for 2002; if we estimate an additional 10 researchers for the 2 Research Centers on Aging, we have 100 researchers in the Centers. This means that 37% of the researchers were not members of the 4 research centers; in 2010, 70 researchers, or 33 % of the total number of researchers who were members of REPAR were not members of the research centers, accounting at least in part, for those in non-traditional rehabilitation disciplines. The total number of researchers in rehabilitation in Quebec increased from 137 in the year 2002 to 210 in the year 2010, an increase of 53.2%.

The Department of Rehabilitation in the Faculty of Medicine at Université Laval that houses three professional educational programs (OT, PT and Speech Pathology) has 39 Professors involved in research activities, however, only 19 are members of the CIRRIS Research Center that has a specific rehabilitation mandate, while 20 conduct their research in 5 other research venues, reflecting the breadth of expertise with certain patient populations and the need for specialized laboratory equipment and the housing of animals, not available in a rehabilitation research center.

Data obtained by requesting the information from the 4 research centers and the REPAR
REPAR (Lucie Benoit)
CRIUGM (Helli Raptis)
CRVUS (Johanne Desrosiers)
CRIR (reg et ass) (M. Hamel)
CIRRIS (Isabelle Argall)

6.2 Canada

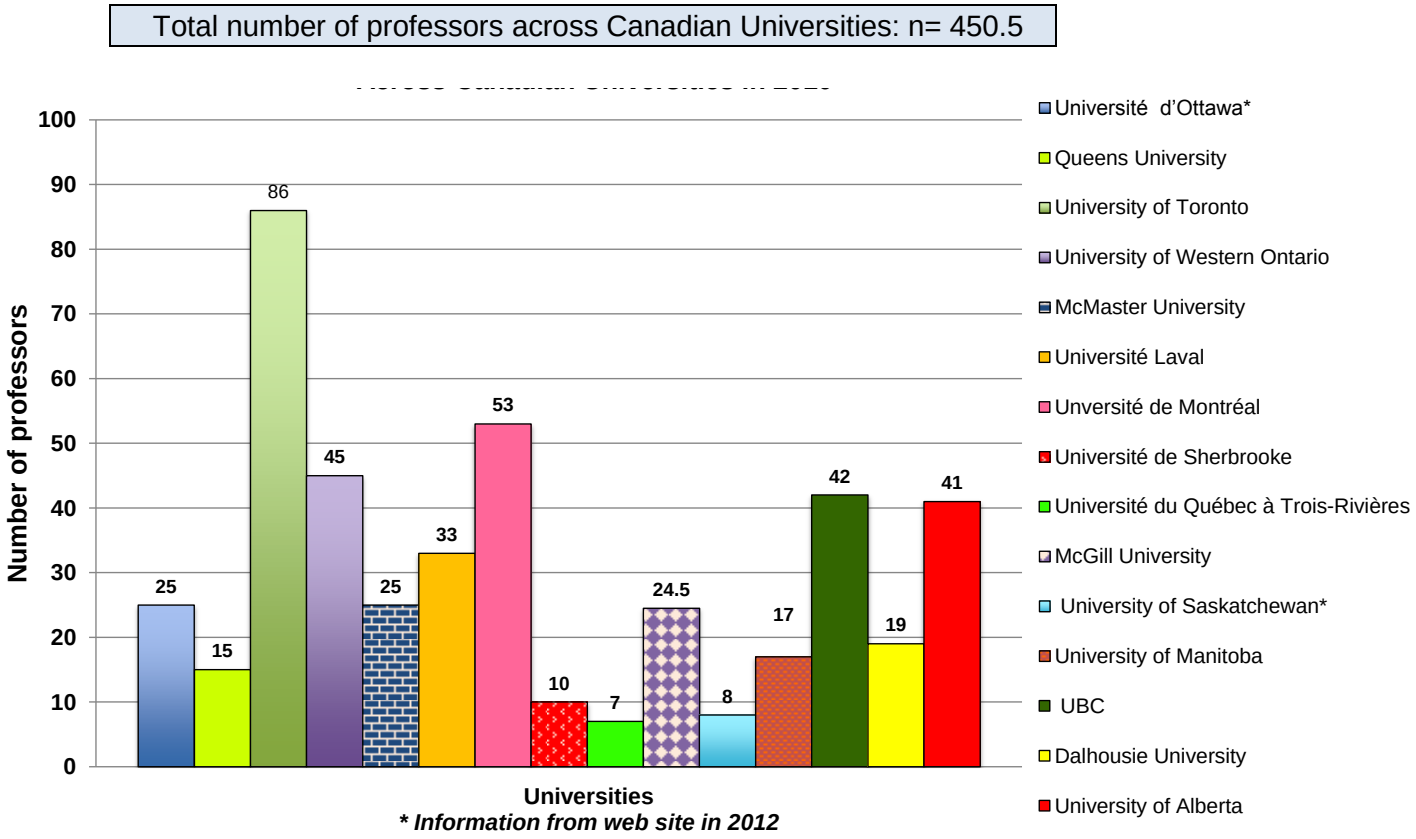
Figure 41. CIHR (2000-2010) Evolution of researchers and trainees in rehabilitation research



The number of eligible application for research grants in rehabilitation rose steadily from 50 in the year 2000-2001 to 551 in 2009-2010, a remarkable **10-fold increase** in 10 years.

Data provided by the CIHR showing number of eligible applications for researcher grants and trainees combined in rehabilitation over the period 2000-2009. This graph illustrates a sustained yearly increase in the number of applications.

Figure 42. Researchers in Rehabilitation Departments across Canada (2010)



Université d'Ottawa, École des sciences de la réadaptation (PT, OT, audiology, SLP)
Queens University, Faculty of Health Science, School of Rehabilitation Therapy (PT, OT)
University of Toronto, Faculty of Medicine, Department of Rehabilitation science (PT, OT, SLP)
University of Western Ontario, Faculty of Health Science, Health and Rehabilitation Sciences (PT, OT, Audiology and SLP)
McMaster University, School of Rehabilitation Science, PT, OT, RS
Université Laval, Faculté de médecine, Département de réadaptation, (PT, OT, SLP)
Université de Montréal, Faculté de médecine, École de réadaptation et École d'orthophonie-audiologie (PT, OT, audiology, SLP)
Université de Sherbrooke, Faculté de médecine, École de réadaptation (PT, OT)
McGill University, Faculty of medicine, School of Physical and Occupational Therapy (PT, OT)
University of Saskatchewan, School of Physical Therapy (PT)
University of Manitoba, School of Medical Rehabilitation (PT and OT)
University of British Columbia, Faculty of Medicine, Department of Occupational Science & Occupational Therapy (OT, PT)
Dalhousie University, Faculty of Medicine, Physical Medicine and Rehabilitation (PT, OT)
University of Alberta, Faculty of Rehabilitation Medicine (PT, OT, SLP and audiology)

Table 5. Number of Professors in Physical Therapy, Occupational Therapy and Speech Pathology in Canadian Universities*

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Université d'Ottawa***													25
Queens University						14	14	13	13	15	15		
University of Toronto : (PT & OT & Speech-Language Pathology)	38	42	49	53	55	58	66	69	80	79	86	78 *	90*
Western University (PT & Sch. Comm. Sciences and Disorders & OT)						38	38	38	38	44	45	49	49
McMaster University						22	25	25	22	25	25		
Université Laval (Pht, erg & orthophonie)	16	22	21	24	23	24	24	26	30	33	33	33	38
Université de Montréal (École de réadaptation & École d'orthophonie-audiologie)	35	40	43	43	45	47	49	49	52	53	53	56	53
Université de Sherbrooke École de réadaptation (formée en 2006)							6	6	8	9	10	12	16
Université du Québec à Trois-Rivières (programme d'ergothérapie depuis 2008)									7	7	7	7	7
McGill University (PT, OT)	17	17	17	17	17	19	22	25	25,5	25,5	24,5	25	27
University of Saskatchewan***													8
University of Manitoba (PT & Kinesiology)						15	14	15	16	16	17	16	18
UBC (OT & PT)						26	29	29	31	35	42		
Dalhousie University (PT)						12	20	20	19	13	19		
University of Alberta (Faculty; Physical Therapy; Occupational Therapy; Speech Pathology & Audiology)				31	32	32	33	36	38	43	41	41	42
TOTAL	**106**	**121**	**130**	**168**	**172**	**307**	**350**	**354**	**379.5**	**397.5**	**417.5**	**317**	**393**

* Sources of data Appendix 5

** SLP not included

*** Missing data from the University of Ottawa, and the University of Saskatchewan

7. Summary of the environmental scan of funding for rehabilitation research

This report is the first, to our knowledge, to undertake an environmental scan of the research funding situation for the field of rehabilitation. It was initiated by the Board of Directors of the Quebec Provincial Rehabilitation Research Network known as REPAR to inform future initiatives. The mandate given Dr Carol L. Richards was first to provide information on the evolution of the funding situation since the year 2000 and then, based on the environmental scan of the funding situation to recommend strategies to optimize the future of research in the field of rehabilitation.

Limitations:

- It is important to outline the limitations of this environmental scan so that the findings may be seen in the proper context.

- Initially, because the project was funded by the Quebec Provincial Network (REPAR), the emphasis was placed on funding in the Province of Quebec. As the work progressed it became clear that the researchers in rehabilitation in Quebec received funds from many sources outside of the Province and that to render a more complete picture of the funding for Quebec researchers that the scan had to be broader. Given, the many grants received by Quebec researchers from one of the three main federal granting agencies and the role of Quebec researchers in the Centers of Excellence related to rehabilitation, it became clear that these had to be included. Finally, it was decided to include three other Provinces, known for their research activities in rehabilitation and having Provincial funding agencies. The reader must be advised, however, that the information reported for these provinces is incomplete and reports only what could be obtained from the main funding agencies.

- The lack of data bases that target the performance of researchers in rehabilitation is a major limitation. Information contained in data bases referring to similar programs do not necessarily concur because methods for data accumulation, archiving or timeliness of the information vary.

- The definition of rehabilitation research used to mine the data bases is highly variable. Furthermore, given the wide range of types of research and scientific disciplines involved in the bio-psychosocial continuum of rehabilitation and the application of modern technology to this field of research, capturing the contribution of all the contributors to the research endeavor is a daunting task. We examined the official FRSQ registries of the funds obtained by the researchers in three rehabilitation-related research centers located in Quebec, Sherbrooke and Montreal. The 139 different sources of funds obtained by the researchers in these three research centers gives us an inkling of the vastness of the research enterprise.

- Much of the information sought, especially pertaining to the number of researchers, was very difficult to gather because it was not included in most of the data bases. Only the FRSQ and CIHR data bases had information on the number of applicants over the years. Attempts to get information from the University Programs proved difficult because many did not have the information available or did not answer requests for information. A decision was made not to try to obtain information from non-traditional rehabilitation programs or medical programs because we not only had little chance of obtaining the information but also of covering all the bases. Consequently, although we know from the partial information available that the number of researchers since the year 2000 has increased exponentially, we cannot be sure of the exact figures.

- This scan documents research funding for researchers in rehabilitation without attempting to justify the need for continued funding or increased funding on the basis of research impact or outcome on the health of Canadians.

Main Findings:

1) Evolution of the field of rehabilitation:

The evolution of the field of rehabilitation has been remarkable over the last 40 years. One must remember that the first MSc programs in this field were initiated in the early 1970s and there were only a few PhDs in this field in the early 80s. Today it is a highly dynamic multidisciplinary (bio-psychosocial and technological) research endeavor. Fueled by the WHO (1980; 2001) and PPH (1998) conceptual models and the increasing number of clinicians, basic scientists, engineers, social scientists and psychologists, and many other areas of expertise interested in various aspects of the rehabilitation continuum, as well as research infrastructures and funding opportunities that encourage a multidisciplinary approach, the rehabilitation research community has attained a critical mass that has grown exponentially in the last ten years as demonstrated in this scan.

2) The mounting needs for rehabilitation in the Canadian population:

The aging Canadian population, especially in the Province of Quebec, as well as technological and medical advances that save or prolong life result in an ever-increasing number of persons who will require rehabilitation services in the future. The most recent Canadian and Provincial statistics on disability rates date from 2006. The disability rate has no doubt increased over the last 6 years given the aging population as predicted. It is not unreasonable to say that at any one time, the number of persons with permanent or disabilities due to disease, accidents, or overuse, that require rehabilitative care is approximately one in four (25%) of the population. The projected increase in the number of persons requiring rehabilitation in the future has already led to an increase in enrollment in Physical and Occupational therapy and Speech and Language programs in the Province of Quebec and this has spurred the recruitment of University Professors with PhD degrees.

3) Declining investments in rehabilitation research since the year 2008-2009

This scan has revealed that the four provinces in which inquiries were made had supported research in the field of rehabilitation by investing considerable funds. Of the Provinces, the investment of the Province of Quebec is noteworthy because it has not only funded career and studentship awards and research projects but has also invested a great deal in research infrastructure with the creation of a Provincial Research Network since 1994 and two Research Centers dedicated to rehabilitation research since the year 2000. Ontario has also provided infrastructure support for the Toronto Rehabilitation Institute (TRI). For the Province of Quebec, the FRSQ statistics show that their investment for career and studentship awards and research projects was about 8.5% of the total investment for these three programs and that the success rate for rehabilitation applicants was similar to that of other disciplines or areas of research for all programs except the post-doctoral program. Statistics on the percent of funds invested or success rates in rehabilitation were not available for other provincial agencies. Were the amounts of Provincial investments adequate to meet the needs of the rehabilitation research enterprise in each province? Probably not, because, as demonstrated by FRSQ data, many applications rated fundable are not funded each year because of lack of funds.

An alarming trend was the decrease in available funds in the most recent years at both the Provincial and Federal levels. The contributions of all three federal agencies together rose to a peak in 2008-2009 of 28,5 M$. This funding pattern reflects the effects of the economic climate on the full spectrum of research in Canada.

From 2000-2010 the CIHR has invested a total of about 83.2 M$ for rehabilitation research, about 61.1 M $ for grants and 22 M$ for training awards. MSK-related rehabilitation received the largest amount, followed by CNS-related rehabilitation, with little funding awarded to cardiac rehabilitation. Funding for childhood disorders was not mentioned in the CIHR statistics. Success rates were only available for rehabilitation research related to the Institute off Musculoskeletal Health and Arthritis (IMHA). The IMHA data bank shows an overall success rate for rehabilitation research that oscillates from a high of 42.2% (2007-2008) to a low of 24% (2005-2006). These are excellent success rates that speak to the quality of the proposals. One must also remember that as the denominator grew across all disciplines applying for grants (some more than others such as rehabilitation) since the beginning of CIHR in the year 2000 and the increases to the overall CIHR budget decelerated, CIHR's overall success rates declined. The finding that success rates for rehabilitation researchers are higher than the overall CIHR success rate likely reflects not only the excellence of the applications but also the review of rehabilitation-related grants by many committees in addition to the MOV committee.

Between the years 2000-2010, SSHRC invested about 12.1 M$ in rehabilitation research with 6,2M $ for grants and 5,8M $ for training grants. SSHRC does not have information on personal salary awards. It should also be noted that since the 2009 Federal budget, SSHRC funding is reduced for health-related research that is eligible under the mandate of CIHR.

From 2004-2005 to 2010-2011, NSERC invested about 61,8M$ for rehabilitation research, 49M $ for grants and 12,6M $ for training grants. It should be noted that these data were provided by NSERC personnel with keywords provided by research personnel involved in this environmental scan. These keywords were used to search the NSERC keyword and title fields of the NSERC Awards Search Engine. It was interesting to note that the NSERC investment was much larger than that of SSHERC, reflecting the importance of technology in the rehabilitation research enterprise.

The three Centers of Excellence (CAN, CSN and NeuroDevNet), particularly CAN have made significant investments in rehabilitation research. The role of the CSN in transforming the approach to research on the rehabilitation of persons post stroke has had a major impact on the Canadian Stroke Strategy. Much of the work of the CSN was done in collaboration with the Heart and Stroke Foundation of Canada. NeuroDevNet, the youngest of the three networks, has already fostered multidisciplinary approach to the rehabilitation of childhood neurodevelopmental disorders, particularly cerebral palsy while the arthritis network (CAN) has encouraged a multidisciplinary approach to arthritic disorders, particularly osteoarthritis.

4) An increasing number of researchers in the field of rehabilitation

An important statistic that reflects on the coming-of-age of research in rehabilitation is the number of research chairs (n=28) held by rehabilitation researchers. The 13 Canada Research Chairs speaks to the excellence of the candidates and also to the involvement of the respective Universities in the promotion of research in this field. Other Research Chairs such as a Chair for Research in Military and Veteran's Health and a Chair in Telerehabilitation reflect developing rehabilitation research foci.

The number of Professors in the Rehabilitation Programs (Physical and Occupational Therapy and Speech Pathology and Audiology) in the Province of Quebec has more than doubled from 68 in the year 2000 to 141 in the year 2012. This increase no doubt impacted on the 387% increase in FRSQ admissible career and training grants from 2004-2011. According to membership data from REPAR, the total number of researchers in rehabilitation in Quebec increased from 137 in the year 2002 to 210 in the year 2010, an increase of 53.2%.

The data obtained on the number of researchers involved in rehabilitation in Canada is incomplete. Because other provinces do not have Provincial Rehabilitation Research Networks, we cannot use estimates based on their membership. Information on the evolution on the number of Professors attached to the University Rehabilitation Programs across the country is incomplete but nevertheless shows a marked increase in the number of Professors.

A current estimate of the number of Professors teaching in Canadian Rehabilitation Programs is 454. This estimate is based on a combination of information from the Programs, although incomplete, and websites. No attempt was made to document the evolution of the number of researchers in programs such as engineering, social sciences, kinesiology, physicians involved in rehabilitation research, nursing, psychology, neuropsychology, or the basic sciences such as neurophysiology, physiology, etc. If we assume that all 454 Professors are involved in research and that 50% more are involved in research but are not associated with University Rehabilitation Programs, we come to a figure of about 680 researchers in rehabilitation in Canada.

5) Mismatch: Investments, Number of Researchers, Population Needs

While this environmental scan confirms that there is a flourishing rehabilitation research endeavour that spans the rehabilitation research continuum, it also demonstrates the need for investments from a multitude of funding sources to cover the different types of research involved in this continuum. Thus at the federal level the three main agencies are involved: CIHR, NSERC and SSHERC. In Quebec, the three major funding agencies are also involved as is the Ministry of Health and Social Services as a partner funder for the two Rehabilitation Research Centers.

There is no doubt that the Canadian Foundation for Innovation (CFI) has played a major role in providing infrastructure funds for a number of individual and groups of researchers across Canada. Some of these infrastructure grants were associated with awards of Canada Research Chairs while others were awarded on the basis of excellence in competitions. This scan was not able to document the number and amount of CFI awards in Ontario, Alberta and British Columbia and only to estimate awards in Quebec.

Profiles of the funding levels at the Provincial and Federal levels show an alarming levelling off or a decrease in funding after a peak attained in 2008-2009. As mentioned previously, such a funding scenario affected all spheres of research in these years and mirrors the economic situation. This decreasing availability of funds, however, came at a particularly bad time for the expanding rehabilitation research endeavor across Canada. This decline in funds is associated with a more than two-fold increase in the number of researchers involved over the same time span. Moreover, this funding mismatch comes at a time when there is an ever-increasing need for rehabilitation research to guide the evolving rehabilitation service organisation as the number of persons requiring rehabilitation services is ever- increasing due to the changing demographics of Canadian society.

8. Examples of effective partnership strategies to augment funds available for rehabilitation research programs.

The following are examples of partnerships that have been successful in promoting strategic research initiatives in the Province of Quebec and in Canada.

- **The Quebec Provincial Rehabilitation Network (REPAR)**, has developed a number of successful partnerships over the years that have been instrumental in promoting research activities in different sectors.

  - Partnerships with other Networks such as : Aging, Pain, and Vision to promote a multidisciplinary approach to research questions

  - **The " Programme de recherche en réadaptation et intégration sociale en traumatologie (PRRIST). This research program, initiated in 2001 (no longer)** brought together the SAAQ (Quebec`s Car Insurance Company), the MSSS (Health and Social Services Ministry) and REPAR to finance a team grant type of research program in rehabilitation and social integration for persons victims of trauma. It was hoped that this grant would lead to the submission of a team grant to the CIHR.

  - **The Ontario Neurotrauma Foundation-REPAR partnership** was initiated to promote collaborative research activity between researchers in Quebec and Ontario in the areas of spinal cord (SCI) and acquired brain injury (ABI) rehabilitation. The general objective of the program is to build capacity and a culture of research collaboration between rehabilitation-based researchers in the two provinces. It is hoped that ONF-REPAR teams will be in the position, as a result of this program's funding, to move forward with larger multi- centre, inter-provincial research programs in SCI and ABI.

  - **The Strategic Training Initiative in Health Research (STIHR) grants** initiated in July 2001 were developed to increase research capacity nationally and to encourage a multidisciplinary approach to mentorship. The REPAR partnered with the CIHR in 3 studentship programs: the Mentor project (biomechanics, engineering and rehabilitation of back problems, especially scoliosis), the Alberta Musculoskeletal Program, and a multidisciplinary approach to back problems.

  - **The Consortium for the development of research in traumatology** is a partnership of the REPAR, the Association of Physical Rehabilitation Centers in the province of Quebec (AERDPQ), the Quebec Association of Health and Social Services Establishments (AQESSS), the IRSST, the MSSS, the SAAQ and the FRSQ. The purpose of this partnership program is to encourage collaboration among researchers, clinicians, decision makers (clinical, administrative and political levels) to meet the expectations of the decision makers and to improve the

quality of care and services for persons with traumatic injuries. Other aims include: the pursuit of new knowledge, the recruitment of new researchers and student mentorship as well as to maximize the use of research results to inform decision making.

- **Other examples of partnerships**

  - **The Pfizer-FRSQ Innovation Fund** is designed to support innovative, large-scale multi-institutional research projects in human health that have a strong likelihood for technology transfer and commercialisation. The objective of this program is to act as a catalyst for innovative translational research and stimulate an entrepreneurial culture within Quebec Universities and Affiliated Hospital Based Research Centres. Priority topics are: neurodegenerative diseases, cardiovascular and metabolic diseases, cancer, inflammation, mental health and chronic diseases.

  - **The funding partnerships developed by the Centers of Excellence** are further examples of very successful funding partnerships with, for example, foundations in their respective areas of research.

  - **The CIHR Strategic Initiatives and the CIHR Multi-Institute Team grant initiatives are examples of highly successful partnership models** to promote inter-disciplinary approaches to research priorities. This model pools funds from the participating Institutes and sometimes other partnerships as well to allow for the development of multidisciplinary team grant programs to respond to identified research priorities.

    - The Regenerative Medicine and Nanomedicine Initiative (RMNI) “initiative is co-led by the Institute of Neurosciences, Mental Health and Addiction and the Institute of Genetics. RMNI and its partners provide support for research in nanomedicine, gene therapy, stem cells, tissue engineering, and rehabilitation sciences. The fundamental goal of this initiative is the development of meaningful multi-disciplinary research approaches to regenerative medicine and nanomedicine. This necessitates the integration of the physical, engineering, computational and chemical sciences, among others, with the health sciences. These approaches need to balance consideration of the social, cultural and ethical impacts of these novel technologies with key rehabilitation and accessibility issues, as well as the potential economic costs of such treatments. Research into the maintenance of health or prevention of disease and degeneration is also encompassed by this initiative”.

    - The Health Challenges in Chronic Inflammation Initiative team was developed by IMHA and the Institute of Infection and Immunity in partnership with the Institute of Aging; Institute of Cancer Research, Institute of Circulatory and Respiratory Health, HIV/AIDS Research Initiative, Institute of Nutrition, Metabolism and Diabetes,

INMHA, AllerGen NCE Inc., Cystic Fibrosis Canada, Crohn's and Colitis Foundation of Canada, Respiratory Health Network of the FRSQ, and Tekes-the Finnish Funding Agency for Technology and Innovation.

As cited on the web page this program is one of the Roadmap Signature Initiatives of the CIHR which are "major research initiatives meant to implement the CIHR strategic plan, Health Research Roadmap, which sets out a vision to secure Canada's place on the world stage of health research for years to come. One of the four strategic directions is "Addressing Health and Health Systems Priorities" which include as a priority "the promotion of health and reduction of chronic disease and mental illness".

9. Examples of successful Networks that have had an impact on the growth of rehabilitation research

- **The REPAR:** In the Province of Quebec the creation of a Provincial Rehabilitation Research Network (REPAR) in 1994 had a huge impact on the development of research capacity and multidisciplinary priority clinically driven research initiatives in the Province. In addition to funding studentships and scholars, the REPAR integrated clinicians in the research process and was instrumental in developing a research infrastructure in the rehabilitation centers. As mentioned above in the partnership section, REPAR developed research programs with other networks, the Ministry of Health and Social Services, the Quebec Car Insurance Board, the Research Institute for Health and Security in the Workplace (IRSST). REPAR also partnered with the CIHR and the Canadian Stroke Network. Importantly, in the transition period between the MRC and the creation of the CIHR, the REPAR exerted a leadership at the National level (lobbying influential persons implicated in the CIHR creation, organisation of meetings bringing together key players from across Canada, the planning of a consensus conference and the writing of arguments to the Council governing the creation of the Institutes) to promote the need for an Institute dedicated to rehabilitation research.

- **The Canadian Network of Centers of Excellence Program** was created in 1989 as a joint initiative of the Natural Sciences and Engineering Research Council, the Social Sciences and Humanities Research Council, the Canadian Institutes of Health Research, Industry Canada and Health Canada. The NCE currently funds 46 networks and centres through its suite of programs, which mobilize Canada's best research, development and entrepreneurial talent, and focus it on specific issues and strategic areas.

    - Networks of Centres of Excellence (NCE) (16 networks)
    - Knowledge Mobilization Initiative Networks (NCE-KM) (3 networks)
    - Canada-India Research Centre of Excellence (CIRCE) (1 centre)

- Centres of Excellence for Commercialization and Research(CECR) (22 centres)
- Business-Led Networks of Centres of Excellence (BL-NCE) (4 networks)

Three Centers of Excellence (CAN, CSN and NeuroDevNet) have greatly contributed to the enhancement of rehabilitation research in their respective sectors.

10. Decisions "perceived" to have impeded the growth and impact of rehabilitation research

- Decision to not create a CIHR Institute for Rehabilitation: Unfortunately, rehabilitation in 1999 was not perceived to have a large enough capacity to merit an Institute and moreover, it was considered to be more of a cross-cutting component of many of the 13 Institutes that were created rather than a field of research. Officially, the Institute of Musculoskeletal Health and Arthritis (IMHA) was given the mandate of overseeing research related to rehabilitation in the musculoskeletal field. It was one of the six research foci of this Institute along with arthritis, bone, skin, muscle and physical activity.

  This decision meant that researchers interested in different aspects of the rehabilitation continuum could find a research "home" in many of the Institutes and especially when these participated in strategic initiatives related to rehabilitation. Thus those interested in the rehabilitation of childhood disorders, or persons with stroke, the aging population, chronic lung disease, cancer, HIV, arthritis, service organization, or the psychosocial aspects of disability could apply to different Institutes. While the opportunities were available, many found the funding environment to be difficult without the clear pathway that an Institute could have provided.

  One can also argue that IMHA championed the field of rehabilitation among the other 12 Institutes and often kept it prominent in discussions across multiple areas and Institutes. In fact, such an organization may be seen as a plus for the field of rehabilitation giving it the opportunity to align with multiple Institutes that then invest into particular request for applications (RFAs). In fact, many RFAs have led to successful rehabilitation-related team grants.

- Lack of dedicated peer review committees for Rehabilitation Research:

  The National Health Research and Development Program (NHRDP) played a very important role the development of research activities in the field of rehabilitation. In the 80s and early 90s, the NHRDP one and sometimes two, peer-review committees dedicated to rehabilitation research and also launched strategic initiatives such one related to the development of outcome measures in rehabilitation in 1987. With the loss of the NHRDP research program for rehabilitation (around 1993), the field no longer had a dedicated peer-review committee.

The MRC and later the CIHR did not have a dedicated peer review committee for rehabilitation. This led to the creation of the MOV committee (Movement & Exercises) in an attempt to fill this void for the mobility related rehabilitation. This committee has not played its anticipated role in the promotion of rehabilitation research related to movement disorders because many experienced neurosciences researchers, who could already apply to two committees in their field, chose to send their grants to this new MOV committee and the focus quickly shifted from movement-related research in humans to basic work involving animals. Also, this committee was much too focused on movement disorders to cover the continuum of rehabilitation research from impairments to social integration.

On the other hand, the tremendous growth in rehabilitation research happened in spite of only the MOV committee being related to a specific aspect of rehabilitation. Rehabilitation research thus grew despite the apparent limitation of a dedicated committee, presumably in part because there are multiple committees that review rehab-related work. This can be perceived as a plus because it means that rehab is not limited to a specific % of grants or limited to one committee. The finding that the success rate of rehabilitation researchers was much higher than the overall CIHR success rate speaks to the quality of the applications and also likely that the grants were reviewed in multiple committees.

11. **Funding organization in the United States:** Rehabilitation research funding has two main “homes” in the USA.

1) **The Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)** was created at the request of President Kennedy and with the support of congress in 1962. The NICHD was initially founded to realize a vision: to support the world's best minds in investigating human development throughout the entire life process, focusing on understanding developmental disabilities, including intellectual and developmental disabilities (IDDs), and illuminating important events that occur during pregnancy. Since then, the NICHD has achieved an impressive array of scientific advances in its pursuit to enhance lives throughout all stages of human development, from preconception through adulthood, improving the health of children, adults, families, communities, and populations. In pursuit of its broad mission, the NICHD conducts and supports laboratory research, clinical trials, and epidemiological studies that explore health processes; examines the impact of disabilities, diseases, and variations on the lives of individuals; and sponsors training programs for scientists, health care providers, and researchers to ensure that NICHD research can continue.

The National Center for Medical Rehabilitation Research (NCMRR) is a division of the NICHD. The NCMRR aims to foster development of scientific knowledge needed to enhance the health, productivity, independence, and quality-of-life of people with physical disabilities through basic, translational, and clinical research. As stated in the website, " the NCMRR supports research on the following topics: pathophysiology and management of chronically injured nervous and musculoskeletal systems (including stroke, traumatic brain injury, spinal cord injury, and orthopedic conditions); repair and recovery of motor and cognitive function; functional plasticity, adaptation, and windows of opportunity for rehabilitative interventions; rehabilitative strategies involving pharmaceutical and neuroengineering approaches, exercise, motor training, and behavioral modifications; pediatric critical care and rehabilitation; secondary conditions associated with chronic disabilities; improved diagnosis, assessment, and outcome measures; and development of orthotics, prosthetics, and other assistive technologies and devices". http://www.nichd.nih.gov/about/org/ncmrr/Pages/overview.aspx

- The NCMRR has its own National Advisory Board on Medical Rehabilitation Research that meets twice a year to discuss the Center's portfolio and research directions.

- **Center-supported resource:**
  Medical Rehabilitation Research Infrastructure Network

This network of centralized research infrastructure assists young faculty at the formative stage of their careers. Seven centers across the country provide state-of-the-art research facilities, mentorship, pilot grants, and other opportunities particularly relevant to rehabilitation researchers. The Network offers a broad range of expertise, including molecular/cellular biology, muscle physiology and function, biomechanical modeling, bioengineering and robotics, outcomes measures, analysis of large administrative and research datasets, and translation and commercialization of research.

- **NCM*R*R supported research finding:**

  Traumatic Brain Injury (TBI) Clinical Trials Network
  Timmons, SD, Bee, T, Webb, S, Diaz-Arrastia, RR, & Hesdorffer, D. (2011). Using the abbreviated injury severity and Glasgow Coma Scale scores to predict 2-week mortality after traumatic brain injury. J Trauma. Nov;71(5):1172-8.
  http://www.ncbi.nlm.nih.gov/pubmed/22071922

- **Center-related research:**
  NICHD-supported researcher and National Advisory Board on Medical Rehabilitation Research member Todd Kuiken, M.D., Ph.D., talks about his innovative work with neural prosthetics.
  http://www.ted.com/talks/todd_kuiken_a_prosthetic_arm_that_feels.html

- Funding Opportunity Announcement:
  Health Promotion for Children With Physical Disabilities Through Physical Activity and Diet: Developing An Evidence Base (R01). PAR-11-288

2) The National Institute on Disability and Rehabilitation Research (NIDRR), a component of the U.S. Department of Education's Office of Special Education and Rehabilitative Services (OSERS), is the main federal agency that supports applied research, training and development to improve the lives of individuals with disabilities. Accomplishing NIDRR's mission is a first step on the journey toward improving the lives of individuals with disabilities. NIDRR staff and its grantees are therefore committed to:

- *Generating new knowledge and promoting its effective use in improving the ability of persons with disabilities to perform activities of their choice in the community, and*

- *Expanding society's capacity to provide full opportunities and accommodations for its citizens with disabilities.*

NIDRR Programs and Projects: NIDRR conducts comprehensive and coordinated programs of research and related activities to assist in the achievement of the full inclusion, social integration, employment and independent living of people with disabilities. NIDRR's total proposed fiscal year 2001 budget was $141 million ($100 million for research; $41 million for technology requirements). From this budget, NIDRR supported 344 projects.

The Office of Special Education Programs (OSEP) supports a comprehensive array of programs and projects authorized by the *Individuals with Disabilities Education Act* (*IDEA*) that improve results for infants, toddlers, children and youth with disabilities.

The Rehabilitation Services Administration (RSA) oversees grant programs that help individuals with physical or mental disabilities to obtain employment and live more independently through the provision of such supports as counseling, medical and psychological services, job training and other individualized services.

RSA's major Title I formula grant program provides funds to state vocational rehabilitation (VR) agencies to provide employment-related services for individuals with disabilities, giving priority to individuals who are significantly disabled.
http://www2.ed.gov/about/offices/list/osers/nidrr/index.html

12. An action plan to enhance the infrastructure and research funds available in Canada for research across the full rehabilitation continuum

There have been many changes in the research funding environment since 2010 in Canada and in the different Provinces. These changes include: the restructuring of Provincial funding agencies in Quebec and Alberta, the re-design of peer review at CIHR and its SPOR initiative, SHERC's change in research priorities, the end of the funding cycles of the Canadian Stroke Network and the Canadian Arthritis Network at SHERC and a restructuring of Foundations such as the Heart and Stroke Foundation.

These major changes in the research funding environment can be seen as an opportunity to re-examine the funding structure and funding opportunities for research in the field of rehabilitation over the coming years. The picture of rehabilitation research in 2010 as painted by this environmental scan is very different from that of 2000 and light years different from that of the early 1980s when the first researchers with PhDs in the field started their careers. Today, the field of rehabilitation is reaching maturity, it has capacity in terms of number of researchers, and researchers in this field have demonstrated excellence by their ability to obtain grants in a period of budget constraints. Importantly, the needs for evolving rehabilitation services and of research to guide these changes are ever-increasing with the demographics of the Canadian population.

Main recommendation:

1) Convene a Brainstorming-type of Conference on Rehabilitation Research Funding in Canada

The main recommendation is to convene a " brainstorming" type of Conference that would bring together representatives of the major funding agencies (federal and provincial), foundations and other funding partners, researchers, patients and caregivers representing the continuum of rehabilitation research and other key persons known to be visionary thinkers. The objectives of such a Conference would be to examine the Canadian funding landscape for rehabilitation research in the next 10 years and on the basis of this analysis to propose how to best position rehabilitation research in the evolving funding landscape.

This environmental scan lays the ground for further discussion. Analysis of the research investments and the ever-increasing number of researchers in the field of rehabilitation over a 10-year span from the year 2000 to 2010 and the organizational structure of the rehabilitation research enterprise in Canada has documented many points for discussion:

- An ever-increasing proportion (which may be a large as 20-25% at any one time) of the Canadian population require effective state of the art rehabilitation services
- Investments in rehabilitation research began to decline in the year 2008-2009; a situation that mirrors research funding for all disciplines.

- The number of researchers has more than doubled in the last 10 years
- Mismatch between investments and needs (number of researchers and best practice requirements)
- Research infrastructures and changes in the funding objectives and organization:
    - The success of REPAR as a Provincial Research Network
    - The success of the Centers of Network of Excellence
    - The success of strategic CIHR Team Grants
    - Is the current organizational structure for rehabilitation in CIHR optimal? If not, what are alternative organizational structures?
    - How can ongoing changes in the CIHR peer review system and the SPOR initiative favor the development rehabilitation research along its full continuum?
    - What is the impact of the reduced role of SSHERC in rehabilitation research since 2009
    - Are there lessons to be learned from the American organizational model for research in the different aspects of rehabilitation research?
    - What type of partnerships can be envisaged that would promote rehabilitation research?
    - Are there lessons to be learned from the new research structure in Alberta, the “Alberta Innovates Health Solutions” ?

2) Strike an organizing committee that has representatives from the CIHR, NSERC and SSHERC, the main Provincial Research Agencies and REPAR to plan the Conference and to solicit funding.

3) Funding for such a Conference:

The recommendation is that such a Conference should be a national endeavor and that funding should be sought from the main federal and provincial funding agencies.

Respectfully submitted,

Carol L. Richards, O.C., Ph.D., *D.U.*, P.T., F. C. A. H. S.

Quebec, June 28, 2013

Appendix 1

Persons Who Responded to our Request for Information

Provincial Agencies

Quebec :

Fonds de recherche en santé du Québec (FRSQ)

- Dr Howard Bergman, Vice-president and Scientific Director
- Mme Julie Gaudreau, Chef des projets informationnels et des analyses

Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST)

- M. Daniel Côté, Professionnel scientifique, Service veille et gestion de la qualité

Ministère de la Santé et des Services sociaux (MSSS)

- Mme Manon St-Pierre, Directrice à la Direction de la recherche, de l'innovation et du transfert des connaissances
- Mme Julie Couture, Direction de la recherche, de l'innovation et du transfert des connaissances
- M. Éric St-Gelais, Conseiller en orientation et coordination de la recherche et de l'innovation, MSSS
- Pierre Arcand, Technicien en recherche, Banque sur la recherche sociale et en santé (BRSS), Direction de la recherche, de l'innovation et du transfert des connaissances
- André Charest, travaux d'assurance qualité et programmation informatique permettant d'interroger la BRSS
- Yvan Létourneau et Marie Adey, attitrés à la saisie et à la codification des informations.
-

Office des personnes handicapées du Québec (OPHQ)

- Monsieur Francis Dubois, Conseiller à l'évaluation, Direction de l'évaluation, de la recherche et des communications organisationnelles

REPAR

- Dr Sylvie Nadeau, Directrice scientifique

Alberta:

Alberta Heritage Foundation for Medical Research Endowment (AHFMR)

- Kathleen Thurber, Director, Communications & Education
- Alberta Innovates - Health Solutions

British Colombia:

Michael Smith Foundation for Health Research (MSFHR)

- Sarah Arnold, Impact Analysis

Rick Hansen Institute (RHI)

- Bill Barrable, Chief Executive Officer

Ontario:

Ontario Neurotrauma Foundation (ONF)

- M. Kent Basset-Spiers, Chief Executive Officer,

Toronto Rehab Institute

- Dr Geoff Fernie, Vice President, Research
- Bridgette Murphy, BA, MSW, Research Associate, Knowledge Translation Officer, Strategic Policy and Research Communications (SPARC), Toronto Rehabilitation Institute

Federal Government

Canadian Institutes of Health Research (CIHR)

- Dre Jane Aubin, Chief Scientific Officer and Vice-President, Research
  Canadian Institutes of Health Research

Centres of Excellence

NeuroDevNet

- Dr. Daniel Goldowitz, Scientific Director

Canadian Arthritis Network

- Kate Lee, Managing Director

Canadian Stroke Network

- Katie Lafferty, Executive Director

Foundations

Heart and Stroke Foundation / Fondation des Maladies du cœur :
Mme Christine Legrand, Health Policy Department,

Research Chairs in Rehabilitation and Social Integration

To obtain an estimate of the number of Research Chairs available, Dr Richards sent an email to the heads of the Physiotherapy Program or the Schools, Faculties or Departments of Rehabilitation of all the Canadian Universities with such programs. The number of Chairs reported under represents the total number related to research in rehabilitation because holders not associated with Rehabilitation University Programs or Rehabilitation Research Centers or Institutes are not counted.

Appendix 2
Details concerning the data included in Figure 15.

Dans le cas des projets de l'AETMIS, le détail par projet des montants octroyés n'est pas disponible puisque l'organisme est financé par un budget de fonctionnement général;

- Les sommes octroyées par les IRSST ne sont pas rendues publiques. Celles-ci ne sont donc pas compilées dans la BRSS. Ces données sont présentées dans des graphiques séparés.
- Certains organismes ont changé de nom. Le CQRS est devenu le FQRSC et le FCAR qui est devenu le FQRNT. Ils apparaissent comme des organismes distincts dans les tableaux de résultats;
- En 2005, il fut décidé d'arrêter de saisir les projets du FQRNT, ces derniers interpellant peu fréquemment le domaine de la santé et les services sociaux.
- Il fut également décidé d'interrompre la compilation des projets de la Fondation des maladies du cœur et de l'Office des personnes handicapées du Québec compte tenu des ressources limitées. Ces montants seront illustrés dans des graphiques séparés.
- Mots clef utilisés. Requête faite à partir des mots clés fournis par Carol Richards en mars 2011. « Outre le thème réadaptation physique, il faudra aussi considérer le thème intégration sociale. Il faudrait également rechercher les titres de projets contenant les termes réadaptation, participation sociale, traumatisme craniocérébral (et crânio-cérébral), traumatic brain injury, physiothérapie, ergothérapie, intégration au travail, lésion médullaire, blessés médullaires, handicap, incapacité, déficience physique, motrice et motricité. »

Appendix 3
List of funding agencies contributing to rehabilitation research in Quebec

Acronym	DESCRIPTION
CQRS	Conseil québécois de la recherche sociale
FRSQ	Fonds de la recherche en santé du Québec
OPHQ	Office des personnes handicapées du Québec
PSSP	Programme de subventions en santé publique
CRSH	Conseil de recherche en sciences humaines
CRSNG	Conseil de recherches en sciences naturelles et en génie
FCAR	Formation de chercheurs et aide à la recherche
IRSST	Institut de recherche en santé et sécurité au travail
AETMIS	Agence d'évaluation des technologies et modes d'intervention en santé du Québec
IRSC	Instituts de recherche en santé du Canada
FQRSC	Fonds de recherche sur la société et la culture
FMC	Fondation des maladies du cœur
INCC	Institut national du cancer du Canada
ACRCS	Alliance canadienne pour la recherche sur le cancer du sein

Appendix 4

Research funding obtained by researchers in 3 Rehabilitation Research Centers in the Province of Quebec (2009-2011): CRIR, CIRRIS, CRIUGS (n=138 sources; 16% (n=22) outside Canada)

Sources are listed alphabetically

SOURCE FOR 2009-2011	Recognized	Not recognized	Outside Canada
Académie canadienne de médecine du sport		X	
Agence canadienne de développement international (ACDI)		X	
Agence de la santé et des services sociaux de l'Estrie		X	
Agence de santé publique du Canada (ASPC)		X	
American Occupational Therapy Foundation (The)			X
Association canadienne de santé publique		X	
Caisse nationale de solidarité pour l'autonomie (CNSA) (France)		X	X
Canadian Initiative for Outcomes in Rheumatoid Arthritis (Canada)		X	
Centre d'expertise en santé de Sherbrooke (CESS)		X	
Centre de réadaptation Lucie-Bruneau		X	
Centre de réadaptation Mab-Mackay			
Centre de recherche clinique Etienne-le bel du CHUS		X	
Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain (CRIR)		X	
Centre FERASI (formation et expertise en recherche en administration des services infirmiers)		X	
Centre hospitalier St-Mary (Montréal, QC)		X	
Centre interdisciplinaire de recherche en réadaptation et intégration sociale (CIRRIS)		X	
Centre universitaire de santé McGill (CUSM)		X	
Chaire Colonel Harland Sanders en sciences de la vision (Université de Montréal)		X	
Chaire en recherche en paralysie cérébrale (Université Laval)		X	
Chaire FCRSS/IRSC sur la gouverne et la transformation des organisations de santé (GETOS)		X	
Christopher Reeve Paralysis Foundation		X	X
Commission de la santé et de la sécurité du travail (CSST)		X	
Commission permanente de coopération France-Québec		X	
Conseil canadien sur l'apprentissage (CCA)		X	
Conseil Canadien sur la Santé sexuelle de l'homme		X	

SOURCE FOR 2009-2011	Recognized	Not recognized	Outside Canada
Conseil de la santé et du bien-être (Gouv. du Québec)		X	
Conseil de recherches en sciences humaines du Canada (CRSH)	X		
Conseil de recherches en sciences naturelles et génie du Canada (CRSNG)	X		
Conseil de recherches médicales du Canada (CRM)	X		
Conseil des arts du Canada	X		
Conseil franco-québécois de coopération universitaire (CFQCU)			
Conseil oecuménique des Églises (CAN)		X	X
Conseil québécois de la recherche sociale (CQRS)	X		
Conseil Régional d'Aquitaine (France)		X	X
Consejo Nacional de Ciencia y Tecnologia (CONACYT) (Mexico)		X	X
Consortium national de recherche sur l'intégration sociale		X	
Coordenaçao de Aperfeiçoamento de Pessoal de Nivel Superior (Brazil)			X
Essilor Canada ltée		X	
Field Psych Trust (The)			X
Flax Council of Canada	X		
Fondation A. Baker pour la prévention de la cécité	X		
Fondation canadienne d'ergothérapie / Canadian Occupational Therapy Foundation		X	
Fondation canadienne de la recherche sur les services de santé (la) (FCRSS)	X		
Fondation canadienne du rein	X		
Fondation canadienne pour l'innovation (FCI)		X	
Fondation canadienne pour l'innovation (programme relève)	X		
Fondation de l'Hôpital Juif de Réadaptation		X	
Fondation de l'Hôpital Maisonneuve-Rosemont		X	
Fondation de l'Institut de réadaptation Gingras-Lindsay-de-Montréal (La)			
Fondation de l'institut universitaire de gériatrie de Sherbrooke		X	
Fondation de l'Université de Sherbrooke (Sherbrooke)		X	
Fondation de l'Université du Québec à Montréal		X	
Fondation de l'Université Laval		X	
Fondation de physiothérapie du Canada (la)	X		
Fondation de recherche en sciences infirmières du Québec	X		

SOURCE FOR 2009-2011	Recognized	Not recognized	Outside Canada
Fondation des maladies du coeur de l'Ontario (Toronto, Ont)		X	
Fondation des maladies du coeur du Canada (FMCC)	X		
Fondation des maladies du coeur du Québec	X		
Fondation du CHUS (Sherbrooke)		X	
Fondation pour la Recherche sur la Moelle Épinière		X	
Fondation VITAE		X	
Fonds de fiducie des optométristes canadiens pour l'éducation		X	
Fonds de la recherche en santé du Québec (FRSQ)	X		
Fonds de la recherche scientifique (FNRS) (Belgique)		X	X
Fonds pour la formation des chercheurs et l'aide à la recherche (FCAR)	X		
Fonds québécois de la recherche sur la nature et les technologies	X		
Fonds québécois de la recherche sur la société et la culture FQRSC	X		
FRSQ-budget de développement-recrutement	X		
Glaxo Smith Kline		X	
Groupe de recherche interuniversitaire en interventions en sciences infirmières du Québec (GRIISIQ)			
Groupe de recherche interuniversitaire en soins infirmiers de Montréal (GRISIM)		X	
Henry and Karla Hansen Foundation (Danemark)		X	X
Holistic Health Research Foundation of Canada		X	
Hôpital juif de réadaptation (Laval, Qc)		X	
Horses and humans research foundation (HHRF)		X	X
INCA (Institut national du cancer) (France)		X	X
Institut canadien pour la sécurité des patients (ICSP)		X	
Institut Danone / Dannon		X	
Institut de réadaptation de Montréal		X	
Institut de réadaptation en déficience physique de Québec (IRDPQ)		X	
Institut de recherche du centre universitaire de santé de McGill		X	
Institut de recherche en santé publique de l'Université de Montréal (IRSPUM)			
Institut de recherche Robert-Sauvé en santé et en sécurité du travail (l'IRSST)	X		
Institut Nazareth et Louis Braille (Longueuil)		X	
Institut Raymond-Dewar (Montréal, QC)		X	
Instituts de recherche en santé du Canada (IRSC)	X		

SOURCE FOR 2009-2011	Recognized	Not recognized	Outside Canada
Israel Science Foundation (Israël)		X	X
LEUCAN-association pour les enfants atteint leucémie-cancer		X	
Ministère de l'Éducation, du Loisir et du Sport (MELS) (Québec)	X		
Ministère de l'Emploi et de la Solidarité sociale et de la Famille (QC)		X	
Ministère de la Famille, des Ainés et de la Condition féminine (Québec)		X	
Ministère de la Santé et des Services sociaux (Québec)	X		
Ministère des Relations internationales du Québec (Québec)		X	
Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE)	X		
Ministère du Tourisme (Québec)		X	
NARSAD: The Mental Health Research Association (USA)	X		X
National Alliance for Autism Research (NAAR)		X	X
National Health and Medical Research Council of Australia		X	X
National institutes of health (NIH) (USA)	X		X
Office des personnes handicapées du Québec	X		
Ontario Neurotrauma Foundation (ONF) /Fondation ontarienne de neurotraumatologie	X		
Ordre des ergothérapeutes du Québec		X	
Ordre professionnel de la physiothérapie du Québec (OPPQ)		X	
Ordre professionnel des physiothérapeutes du Québec		X	
Organisation mondiale de la santé (OMS)	X		X
Organization for Autism Research (OAR)		X	X
Patrimoine canadien		X	
Physicians Services Incorporated Foundation (the) (PSI)		X	
Producteurs laitiers du Canada (les) (Montréal, Qc)	X		
PROMPT-Québec		X	
Régie de l'assurance maladie du Québec (RAMQ)		X	
REPAR		X	
REPAR-IRSST	X		
Réseau des centres d'excellence fédéral	X		
Ressources humaines et développement social Canada (RHDSC)		X	
Rick Hansen Institute		X	
Rick Hansen Man in Motion Foundation	X		

SOURCE FOR 2009-2011	Recognized	Not recognized	Outside Canada
Santé Canada		X	
Scottish Rite Charitable Foundation of Canada	X		
Secrétariat des chaires de recherche du Canada	X		
Service de santé SCO		X	
Sick Kids Foundation (SKF)	X		
Sir Mortimer B. Davis - Hôpital Général Juif		X	
Société Alzheimer du Canada	X		
Société d'arthrite (la)	X		
Société de l'Assurance Automobile du Québec (SAAQ)		X	
Société Parkinson Canada	X		
Université Concordia		X	
Université de Franche-Comté (France)			X
Université de Montréal		X	
Université de Sherbrooke		X	
Université du Québec à Montréal (UQAM)		X	
Université du Québec à Rimouski (UQAR)		X	
Université Laval		X	
Université McGill		X	
University of New England (UNE) (Australia)		X	X
Ville de Sherbrooke		X	
Whitaker Foundation	X		X

Appendix 5: Sources of data for Table 5

University	Sources of data
Université d'Ottawa	Web site: Université d'Ottawa : École des sciences de la réadaptation
Queens University	Mindy Levin, PhD, Full Professor, School of Physical and Occupational Therapy, Faculty of Medicine, McGill University
University of Toronto : (PT & OT & Speech-Language Pathology)	Katherine Berg, PhD Pt, Chair and Associate Professor Department of Physical Therapy and Graduate Department of Rehabilitation Science & Luigi Girolametto, Ph.D., Professor and Chair Department of Speech-Language Pathology
Western University (PT & Sch. Comm. Sciences and Disorders & OT)	Jan Polgar, PhD, Associate Dean Programs—Graduate and Postdoctoral Studies, Associate Professor - School of Occupational Therapy
McMaster University	Mindy Levin
Université Laval (Pht, erg & orthophonie)	Claude Côté, Ph.D., Professeur titulaire, Faculté de médecine, Département de réadaptation
Université de Montréal (École de réadaptation & École d'orthophonie-audiologie)	Sylvie Nadeau, Ph.D. Professeure titulaire & Tony Leroux, PhD., Professeur agrégé
Université de Sherbrooke École de réadaptation (formée en 2006)	Johanne Desrosiers, Ph.D, Vice-doyenne à la réadaptation, Professeure
Université du Québec à Trois-Rivières (programme d'ergothérapie depuis 2008)	Karine Lethiecq. agente adminitration, Déparete
McGill University (PT, OT)	Mindy Levin & Sarah C. Marshall, Director's Academic Associate, School of Physical and Occupational Therapy, Faculty of Medicine, McGill University
University of Saskatchewan	Web site. University of Saskatchewan. School of Physical Therapy
University of Manitoba (PT & Kinesiology)	Emily Etcheverry, University of Manitoba, School of Medical Rehabilitation (PT and OT only from advisors for MSC graduate program
UBC (OT & PT)	Mindy Levin
Dalhousie University (PT)	Judie Woodward, Administrative Coordinator
University of Alberta (Faculty; Physical Therapy; Occupational Therapy; Speech Pathology & Audiology)	Jaynie Yang, Professor, Department of Physical Therapy & Anita Yates | Assistant Dean Administration and External Relations, Faculty of Rehabilitation Medicine