
Building a Better Canada through Research Hospitals

- Research hospitals are national assets. They are patient care organizations with a tripartite mandate of care, training and research. The majority of health research relies on their leadership and support.
- Employing over 600,000 Canadians, they advance the economy through stable employment and returns in health, life sciences, research, innovation and commercialization

“Research in Canadian post-secondary institutions and research hospitals creates new insights and leads to the technological breakthroughs of tomorrow...” Budget 2016, p. 113

A Year in Review for 2016

- **H10 asked for:** Recognition of the role of research hospitals, immediate restorative funding for the CIHR, and the ability to compete for infrastructure funding.
- **Budget 2016:** Thank you for the name recognition; largest unfettered increase for CIHR (\$30M/yr) and \$2B Strategic Investment Fund for infrastructure to which we could apply.
- **Strategic Investment Fund:** Submitted >35 projects (of ~ 600) for >\$257.5M (of \$2B). Issues in application, but appreciated policy intent. So far: 2 wins; mostly rejections; awaiting news.
- **Government consultations:** We participated in Pre-Budget, Science Review, Income Tax, INFRAconsults, Let’sTalkClimateAction, Let’sTalkSustainability, and Innovation Agenda.

H10 Requests for Budget 2017

1. **Secure Restorative Funding for CIHR:** \$150 M added to A-base budget per year over each of next five years to restore Canada’s competitiveness in health research in light of neglect since 2010.
[Fact Sheet 1](#)
2. **Provide Direct Eligibility for Infrastructure and Innovation Support:** Allow research hospitals to compete directly for funds; crucial to green, public safety, infrastructure Plans.
[Fact Sheet 2](#)
3. **Secure an Innovation Supercluster in the Health and Life Sciences:** We ask that the health and life sciences be supported as one of Canada’s world-leading innovation clusters.
[Fact Sheet 3](#)

Looking Forward

- **Canadian policy and funding framework for research hospitals:** Allowing the federal government to optimize the role of research hospitals nationally and globally while fostering their sustainability (tax policy, research, innovation, infrastructure, environment, heritage, etc.).
[Fact Sheet 4](#)

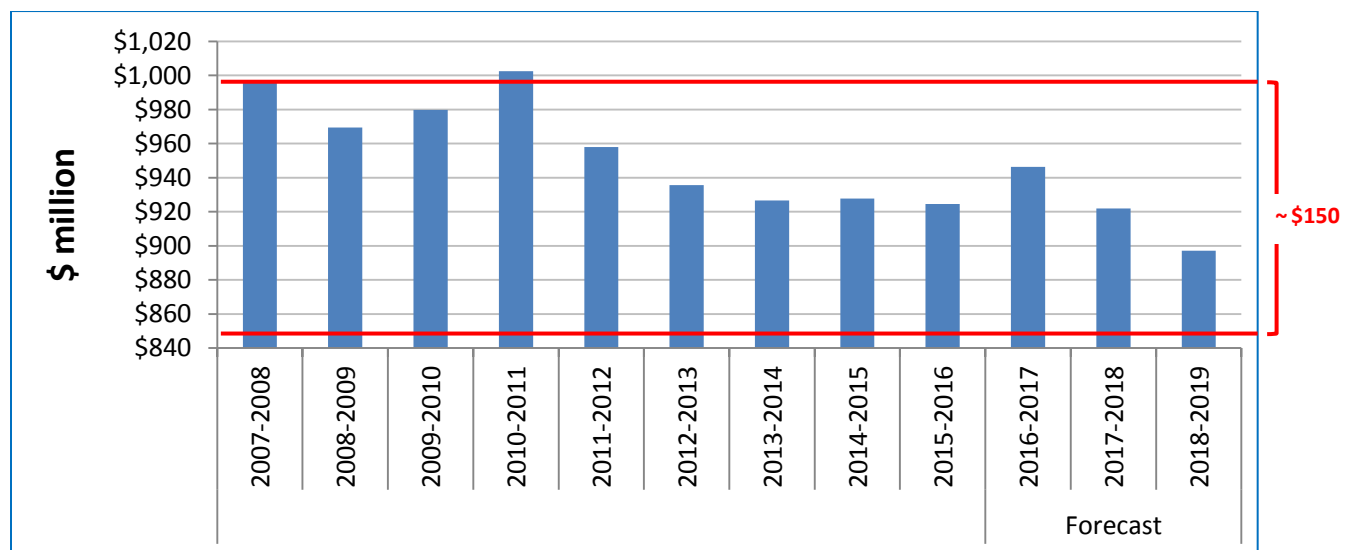
Secure Restorative Funding for CIHR

(Fact Sheet 1)





A Year in Review: Budget 2016 provided the largest unfettered increase to the federal granting councils in a decade. Specifically, for CIHR, the Budget provided for \$30M in additional funding each year. The Federal Budget called for a Science Review, possibly stimulated by concerns in the research community. The report is due end of December. The Association of Early Career Health Researchers was formed. CIHR called an emergency meeting to deal with issues of peer review.

Why is further funding for CIHR necessary now?

- **Budget:** With the exception of Budget 2016, CIHR's core budget has not increased since 2010.



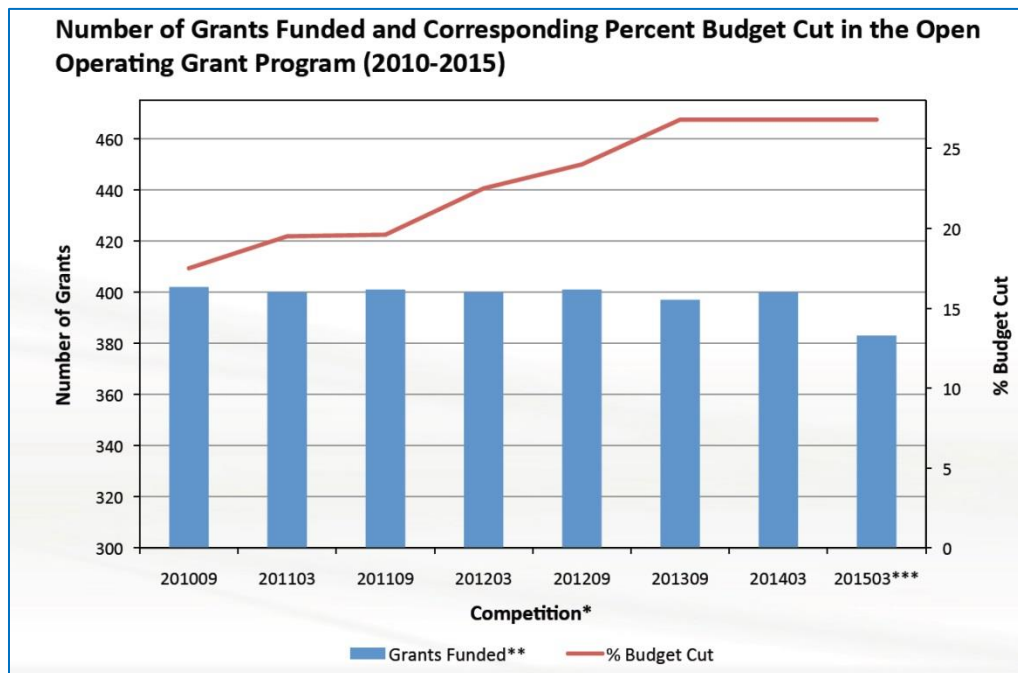
- **International:** Our health research spending is falling behind that of other countries.

Region	Health Research Expenditure (\$M)	Total Health Expenditure (\$M)	Health Research Expenditure / Total Health Expenditure
 United States	\$ 130,383	\$ 2,900,000	4.5%
 Australia	\$ 5,500	\$ 130,000	4.2%
 United Kingdom	\$ 8,500	\$ 235,000	3.6%
 Canada	\$ 6,400	\$ 214,900	2.9%

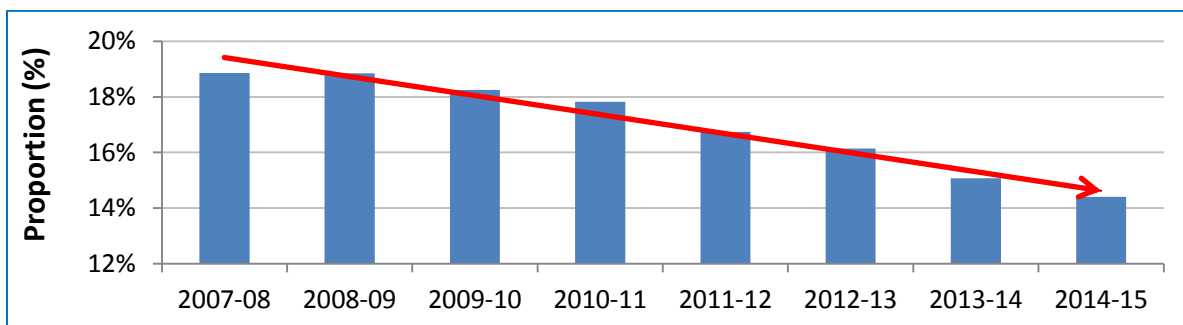
- **Scientific Community Demoralized: Trust needs to be restored.**

<p style="text-align: center; color: #0056b3;">IMPACT OF THE CIHR REFORMS ON CANADIAN HEALTH RESEARCH: A PAN- CANADIAN SURVEY</p> <p style="text-align: center; font-size: small;">Survey Summary Report</p>	 <p>Pushback from scientists forces overhaul of funding system in Canada</p> <p style="font-size: x-small; color: #e91e63;">IVAN SEMENIUK - SCIENCE REPORTER The Globe and Mail Published Thursday, Jul. 14, 2016 7:48PM EDT Last updated Friday, Jul. 15, 2016 11:02AM EDT</p>
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- **Declining Success Rates:** In 2007-2008, CIHR received 3625 application and had a 22.5% success rate. In 2013-2014 there were 5389 applications and 15% success. Applies across men, women, and Canada Research Chairs who are having trouble getting CIHR grants.



- **Early Career Researchers:** The number of grants awarded to early-career researchers has dropped from almost 20% to less than 15%.



Ensure Research Hospital Eligibility for Federal Infrastructure Support

(Fact sheet 2)

A Year in Review: Budget 2016 committed significant infrastructure funds to stimulate the economy. INFRAConsults and various environment consultations were conducted. We saw the effects of disasters in different parts of the country. The Strategic Investment Fund was launched. An Infrastructure Bank has been announced. Research hospitals can benefit Canada in next steps.

Why are we asking for research hospital eligibility to infrastructure funding federally?

- **Deferred Maintenance:** Canada's hospitals are worth \$160 billion, but have accumulated deferred maintenance of ~\$28 billion. Last non CFI federal injection: 1966 Health Resource Fund Act.





"Fort Albany hospital evacuated as flood fears continue"



"Pipe leaks at Victoria General hospital causing minor flooding"



"Canada needs to invest in new hospitals, says health care association"



"Sask. budget doesn't address 'crumbling' health facilities: NDP"



"Edmonton hospitals need millions in maintenance"



"The hospital of the future"



"Alberta hospitals crumbling, rural facilities underused and system manipulated by politics"

- **Research and innovation:** Research hospitals are essential for universities, colleges and industry to conduct health and life science research and are training and employment grounds for students.
- **Economy:** Building hospitals is big business. 14 of Top 100 Infrastructure Projects are hospitals (\$10.6 B of total \$ 162 B). Fixes the workplaces over 650,000 Canadians.

Top 100
Canada's Biggest
Infrastructure Projects

Rank	Hospital	Infrastructure project cost (\$)
16	CHUM Redevelopment	\$ 2,600,000,000
52	CHU Ste-Justine	\$ 939,600,000
60	Providence Care Hospital	\$ 810,000,000
69	BC Children's & Women's Hospital / Health Centre Redevelopment	\$ 676,000,000

- **Environment and Safety:** Hospitals operate 24/7. They have significant chemical, waste, energy, water, transportation, food, pharmaceutical, physical plant, and purchasing requirements. Old is inefficient and behind the times in terms of environmental innovation. Canadian hospitals account for 8% of public greenhouse gas emissions and 10% of total public energy consumption. They don't resist disaster right now. In other countries it is illegal to build hospitals that are not resilient.

What are we doing about this persistent problem?

- In a recent survey, hospitals identified 444 physical plant initiatives intended to repair, retrofit or rebuild facilities so that they are cleaner, greener, more efficient, sustainable and resilient.

Primary Purpose(s)	# of projects in 2012 (%)	# of projects in 2016 (%)
Green/Environmental Technologies/Renovations	83 (22%)	264 (59%)
Research and/or Teaching Residents/Students	66 (17%)	35 (8%)
Emergency Departments/Acute Care/ICU	62 (16%)	114 (26%)
Primary Care/Ambulatory /Day Clinics/Community	56 (15%)	29 (6%)
Rehabilitation, Healthy Aging and Long Term Care	28 (7%)	17(4%)
Women and/or Children’s Health	18 (5%)	4 (0.5%)
Mental Health Services	12 (3%)	8 (2%)
Total*	381	444

What has the Federal Government done about this problem?

- Federal Government allowed hospitals to apply to an infrastructure fund (Strategic Investment Fund) which was targeted at legacy research, innovation and commercialization projects.

What happened during the Strategic Investment Fund program?

- We are certain that 13 research hospitals in 5 provinces submitted 35 projects worth \$257.5M.
- We are told that there may be up to an additional 20 projects worth ~\$250M also submitted.
- We are aware 2 research hospitals so far have succeeded (Horizon and Vitalité in NB).
- Hospitals which are independent legal entities were asked to get a University President signature.
- Some universities cited risk and prioritization, declined signatures, rendering applications ineligible
- Provinces often did not appreciate communities replaced provinces’ matching fund requirements
- Some provinces may have had incentives to focus on universities. Missed opportunity for Canada.

How does our current ask support the Federal Agenda? *(from mandate letters)*

Minister of Finance	<i>“...develop the Canada Infrastructure Bank to provide low-cost financing (including loan guarantees)... Work with the Minister of Environment and Climate Change in creating a new Low Carbon Economy Trust to help fund projects that materially reduces carbon emissions under the new pan-Canadian framework.”</i>
Minister of Infrastructure	<i>“...goal will be to begin to rebuild Canada for the 21st Century. This will require significant new investments in ... green infrastructure, and social infrastructure ... key strategic infrastructure that will increase trade and economic growth.”</i>
Minister of Environment	<i>“Your overarching goal will be to take the lead in implementing the government’s plan for a clean environment and a sustainable economy. Your key priority will be to ensure that our government provides national leadership to reduce emissions, combat climate change and price carbon.”</i>

Secure an Innovation Supercluster in the Health and Life Sciences

(Fact Sheet 3)

Year in Review: ISD's website describes the prowess of Canada's Health and Life Sciences Sector in terms of the pharmaceutical, biologics, device and government, academic and industry partnerships. Despite this, there is no infrastructure to support it. With the inception of an innovation agenda, we'd like to see the Health and Life Sciences Sector in Canada united.

1. Many collaborators in the health and life sciences; no organizing framework or table



...and others.

2. Big collaborators are big R&D Spenders:

- Of Canada's top 100 R&D private sector spenders who spend 12.8B in total, about one quarter are health and life science companies.
- Canada's research hospitals contribute \$2.6B in total R&D spending ~ 10% of the total top 100 private sector R&D spenders in all sectors and about 25% of all R&D in universities.
- Between 2004 and 2013, hospital researchers were noted by STIC as the most frequent collaborators in the economy having co-authored 13% of all university publications.
- Clinical medicine, biomedical research and biology are high collaboration areas next further behind is aerospace.

3. Health and Life Sciences Puts Canada on the World Stage

- Canada conducts about 10% of the world's active clinical trials; about 40% of these occur in research hospitals. About 10% of all medical device companies are spinoffs.
- Every research hospital has one or more Canadian or World "first" that has hit the media in the past five years
- Canada is the 10th largest world market for pharmaceuticals: 10 companies make up 50% of the market share in Canada. We have 2% of the world market for devices.
- Canada's research hospitals have a total budget (R&D and otherwise) of \$45B about 6% of this is R&D.

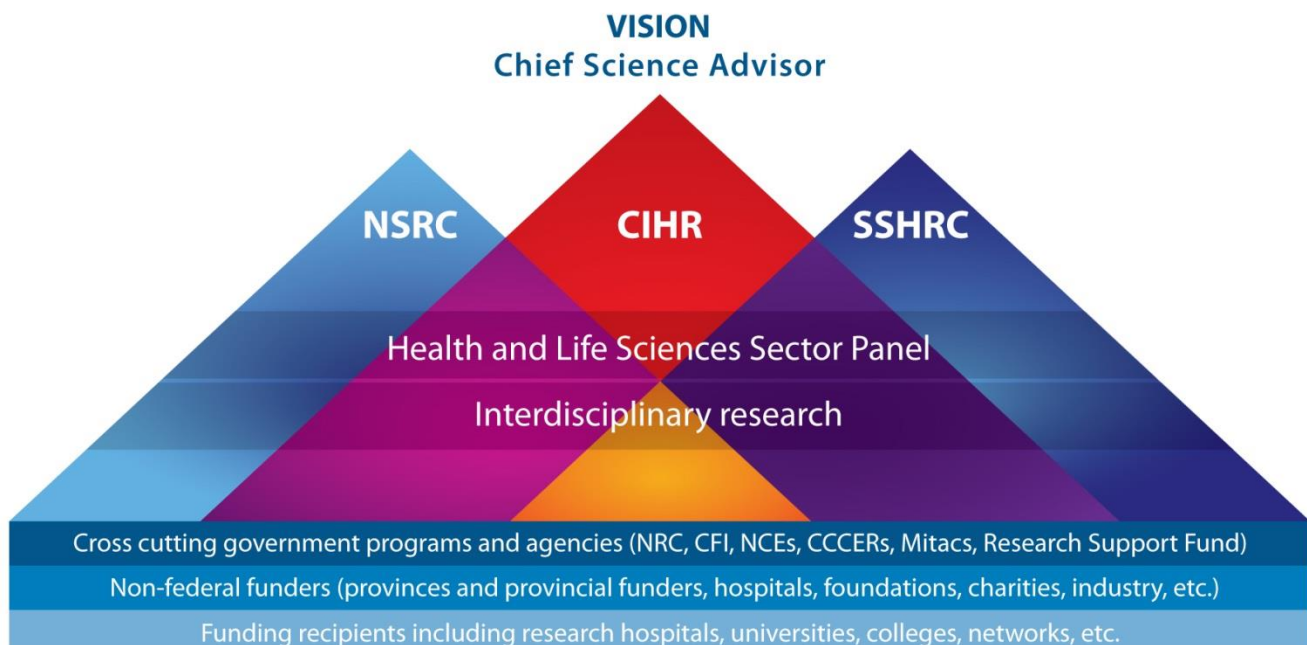
4. Health and Life Sciences are stable employers and contributors to society

- Canada's research hospitals employ over 650,000 Canadians including an estimated 66,000 people in R&D. Canada's pharmaceutical companies employ an additional 33,000.
- Canada's research hospitals treat 99% of the top 13 most rare and complex diseases, support 55,000 trainees, and 45,000 volunteers.

Recommendations:

- (1) A more coordinated health and life sciences research ecosystem and roundtable (Figure 1)
- (2) A supercluster for the health and life sciences to unite all partners and compete globally
- (3) Full recognition and independent application privileges for research hospitals

Figure 1: Proposal for a more coordinated health and life sciences research and innovation ecosystem





#5 Research hospitals= health & life science partners

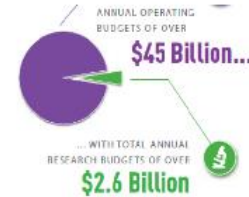
"From 2004 to 2013, hospital researchers were by far the most frequent collaborators, having co-authored 13.1 percent of all university researchers' publications...." (STIC, 2014)



"Consistent with the large number of collaborations between university and hospital researchers over the period, the highest collaboration rates were in the fields of clinical medicine (35.6 percent), biomedical research (26.6 percent) and biology (26.0 percent). Among other fields, the only noteworthy collaboration rate was in earth and space sciences (20.7 percent)...." (STIC, 2014)



#6 Research hospitals= R&D Performer



health research in hospitals = 25% of all research in research universities

~6% of total Budget for R&D



#7 Research hospitals= Productivity



#8 Research Hospitals = Translation

20 Focus PATIENT SAFETY/ MENTAL HEALTH AND ADDICTION RESEARCH

From research to care:

Five years of Canadian "firsts" pave the way for decades of medical advancement

By Claire Samuelson

In 2012, Canadian researchers Drs. Charles Bredt and Frederick Stoltz discovered a mutation in a gene that causes a rare form of epilepsy. In 2013, Toronto physician Dr. Nigam, John Calaghan and John Hagan developed the first artificial pancreas for people with type 1 diabetes. In 2014, the research team at the University of Toronto and St. Michael's Hospital made an incredible discovery that would enable the first human marrow transplant for the treatment of blood cancer.

These healthcare and research "firsts," which appear in regular print media, are tracked through HealthCareCAN's award-winning tool, Innovation Sensation, a searchable database that highlights innovative breakthroughs from Canada's research hospitals. We encourage you to visit www.healthcarecan.ca to view thousands of other healthcare and research "firsts" and join your favorites.



#9 Research Hospitals = Clinical Trials

Canada conducts 10% of the world's listing of active clinical trials (source: ClinicalTrials.gov)

42 research hospitals conduct about 36% of CTs in Canada (source: extrapolation based on data from CAICR website).



(Number of active trials source: ClinicalTrials.gov)



#10 Research Hospitals = Canada on World Stage

Changes coming to B.C. cancer treatment system
July 21, 2016
British Columbia is the first province to implement the new Cancer Care BC system for cancer patients, but it won't be the last, and the list of innovative treatments will continue to grow and become more robust as each patient's information is added to the database. Agencies across Canada are also working together to discuss the accelerated clinical trials of off-label treatments with pharmaceutical companies.

Vancouver Coastal Health sets new guidelines for treatment of opioid addiction
November 1, 2015
Vancouver Coastal Health has established a "first-of-its-kind" guideline in the treatment of opioid addiction, recommending that doctors use an alternative to methadone as a first line treatment. The new recommendations are aimed at improving patients' knowledge of treatment options in light of ongoing challenges with methadone and opioid overdoses linked to fentanyl and overdose.

Women's College unveils Toronto's first (high-tech) outpatient hospital
June 12, 2015
Women's College Hospital has unveiled Toronto's first outpatient clinic. The contemporary facility is a significant milestone in the province's plan to transition health care out of hospitals and into home and community settings, where patients are more comfortable and are less at risk of exposure to harmful infections. Designed to allow patients to return home as quickly as possible, there are no in-patient beds, and the research is to provide a more accurate measurement of the brain function in Alzheimer's patients using hyperpolarized arsenic. It is believed that when patients inhale hyperpolarized arsenic gas, researchers will be able to take a clearer picture of the brain when using an MRI machine. The study will be the first large scale clinical trial in the world using hyperpolarized gas to take an image of the brain.

Toronto hospital becomes world's first to treat brain tumour with non-invasive procedure
November 9, 2015
Scientists at Sunnybrook Health Sciences Centre are the first in the world to use focused ultrasound to breach the blood-brain barrier of a patient with brain cancer precisely and non-invasively. They used focused ultrasound, pioneered by a Sunnybrook Research Institute scientist, to deliver chemotherapy directly to the brain tumour. They are poised to launch another world first evaluating this technology for patients with Alzheimer's disease.

North American first in children: SickKids doctors destroy bone tumour using incisionless surgery
August 6, 2014
The Hospital for Sick Children is the first in North America to use a minimally-invasive, incisionless surgical technique to destroy a bone tumour in a child.

Where's Zika going next? Maybe China, India, or Nigeria
September 1, 2016
In January 2016, before the World Health Organization declared Zika virus a public health emergency, Dr. Kenyon Khan published a letter in The Lancet highlighting the potential for this emerging virus to spread quickly across the Americas. In that analysis, southern Florida was identified as one of the highest risk areas for the research of a wide range of diseases. At St. Joseph's, the cell is being used for research on schizophrenia and depression disorders, Alzheimer's disease, dementia, and the study of brain damage resulting from chronic diabetes.

Researchers produce first widely protective vaccine against chlamydia
July 21, 2016
Canadian researchers have developed the first widely protective vaccine against chlamydia, a common STI that is mostly asymptomatic but impacts millions of people around the world each year and can result in infertility. Performed at St. Joseph Healthcare Hamilton's Research Institute, the study would be the best way to treat the infection, and may prevent or eliminate its damaging reproductive consequences.

Results of world's first study on new treatment for heroin addiction
August 6, 2016
The Hospital for Sick Children is the first in North America to use a minimally-invasive, incisionless surgical technique to destroy a bone tumour in a child.

For Canadian 1st Series: Visit www.healthcarecan.ca or follow us on Twitter until December 8, 2016!