Practice making perfect:

The Canadian Academy Health Science Impact Framework Forum

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Edmonton
Overview

♦ Why, What, Who is CAHS?

♦ Assessments: the key CAHS signature

♦ Emergence of Return on Investment

♦ Impact of ROI

♦ Future Perspectives
CAHS: Beginnings

- Created in 2005 with the mission to provide advice on and assessments of key issues relevant to the health of Canadians
- One of three founding member academies engaged in the creation of Council of Canadian Academies (CCA formerly CAS)
- Collaboration of all health disciplines
- Advisory Board (13)
- Non profit organization
Who is CAHS?

- Unique group of multidisciplinary, health scientists celebrated for their achievements, leadership & record of service (*all health disciplines under 1 umbrella*)

- New collaborative body, previously nonexistent in Canada, yet flourishing elsewhere e.g. US (Institute of Medicine), UK and internationally

- Importantly CAHS is *not* an advocacy group: members serve as unpaid volunteers to enhance the health & best interests of all Canadians

- CAHS is independent, non-vested & unbiased.
CAHS: Mission (I)

1. Serve as a credible, expert, independent assessor of S&T issues relevant to health of Canadians

2. Recognize and acknowledge outstanding health science leaders in Canada

3. Support development timely, informed & strategic advice on urgent health issues

4. Facilitate development of sound & informed public policy on these issues
5. Enhance understanding S&T issues affecting the public by transmitting assessment results of & providing opportunities for public discussion

6. Provide a single authoritative & informed voice for the health science communities

7. Represent Canadian health sciences internationally & liaise with international academies to enhance understanding and potential collaborations
Assessments
The National Science Organization Working Group (responsible for concept Canadian Academies of Science) in 2002 defined the term *assessment*;

“Assessment involves understanding what we know about the sciences underlying an issue & more importantly, what we do not know; it defines what questions remain unanswered; it establishes a holistic view of complex issues & clarifies areas of concurrence, divergence & uncertainty (where they exist); it examines the validity of the sciences informing the issue.”
Criteria For Assessment Topic Selection

- Consistent with mission of CAHS &/or CCA
- Timely, relevant & important in public domain
- Priority for public; useful to inform Government
- Of interest to sponsor
- Sufficient knowledge exists to facilitate decision making
- Development of actionable options
Why ROI in Health Research? (1)

- Concern about **accessible, affordable, high quality health care** in a publicly funded system

- **Increasingly common view** that health care / health research is a cost-driver consuming an ever greater share of resources at expense of other sectors

- Concern about **expenditure accountability** in both the public and private sectors in Canada and abroad

- Lack of public understanding of the **value of research applicability to current issues in health**

- Need to adequately **measure & meaningfully convey benefits of health research** to policy-makers & public
Why ROI in Health Research? (2)

- Lack of consensus on how and when to best evaluate return on research expenditures
- Questions from policy makers about tangible results attributable to recent increases in public investment in health research e.g. CIHR, CFI, CRC programs
- Uncertainty about appropriateness of Canada’s health research expenditures versus those of analogous contributions in other industrialized countries
- Need to acquire appropriate evidence to strike right funding balance between investigator-initiated “discovery” & targeted “strategic” health research
CAHS Standing Committee on Assessments

- **Andreas Laupacis**, MD (Chair), Executive Director, Li Ka Shing Knowledge Institute of St. Michael's Hospital; Professor, Faculty of Medicine, University of Toronto
- **John A. Cairns**, MD, Professor of Medicine and Dean Emeritus, UBC
- **Timothy Caulfield**, LLM, CRC Health Law and Policy; Professor, Faculty Law & School Public Health; Research Director, Health Law Institute, University of Alberta
- **André-Pierre Contandriopoulos**, PhD, Professeur Titulaire, Département d'Administration de la santé, Université de Montréal
- **Alastair Cribb**, DVM, PhD, Dean, Faculty of Veterinary Medicine, U of Calgary
- **Jean Gray**, CM, LLD, DSc, Professor Emeritus, Dalhousie University
- **Pavel Hamet**, MD, PhD, CRC, Predictive Genomics; Chief, Gene Medicine Services, Centre de recherche Centre hospitalier de l’Université de Montréal
- **Dorothy Pringle**, OC, RN, PhD, Professor Emeritus, Faculty Nursing, U of Toronto
- **Matthew Spence**, OC, MD, PhD, Retired President and CEO, AHFMR
- **Peter S. L. Tugwell**, MD, CRC in Health Equity; Director, Centre for Global Health (Institute of Population Health); Professor of Medicine & Epidemiology, U Ottawa
- **Sharon L. Wood Dauphinee**, PhD, PT, Professor, McGill University Montreal
Steps in a CAHS Assessment

- Choice of topic
- Choice of chair
- Choice of assessment panel
- Panel’s independent work
- Review of draft report by external reviewers and CAHS Assessment Committee
- Revision of report
- Approval by CAHS Board
Cy Frank 1949-2015
**ROI Sponsors**

**Major Sponsors**
- Canadian Health Services Research Foundation
- Canadian Institutes of Health Research
- Canada’s Research-Based Pharmaceutical Companies
- Public Health Agency of Canada

**Sponsors**
- Alberta Heritage Foundation for Medical Research
- Association Canadian Academic Healthcare
- Association Faculties Medicine Canada
- BIOTE Canada
- Canadian Agency Drugs & Technologies in Health
- Fonds de la recherche en santé du Québec
- Government Ontario, Ministries Research & Innovation; Health & Long-Term Care
- Heart & Stroke Foundation Canada

**Sponsors (continued)**
- Manitoba Health Research Council
- Michael Smith Foundation for Health Research
- National Cancer Institute of Canada
- Nova Scotia Health Research Foundation
- Ontario Neurotrauma Foundation
- Saskatchewan Health Research Foundation
- Western Economic Diversification Canada

**Contributors**
- Canada Foundation for Innovation
- Canadian Association of Schools of Nursing
- Canadian Medical Association
- Canadian Nurses Association
- Canadian Nurses Foundation
- Newfoundland & Labrador Centre for Applied Health Research
- Research Canada
The Panel

- Cy Frank (Chair) – U. Calgary
- Renaldo Battista – U. Montreal
- Linda Butler – Australia Nat. U.
- Martin Buxton – Brunel U. (UK)
- Neena Chappell – U. Victoria
- Sally Davies – Dept Health, UK
- Aled Edwards – U. of Toronto
- Chris Henshall – U. York (UK)
- Yann Joly – U. Montreal
- Gretchen Jordan – Sandia Labs, U.S. Department of Energy
- Terence Kealey – U. Buckingham (UK)
- Michael Wolfson – Statistics Canada
- Steven Woolf, Virginia Commonwealth U.

scientific advice for a healthy Canada
Evolution Of Return on Investment Assessment

CAHS Executive or Board
- Assessment Panel and staff
- Assessment Standing Committee
- Sponsors
- External Reviewers
- Others

**Sponsor’s input**
- Initial literature and expertise searches, drafting prospectus, fundraising, communication to sponsors, forum planning, financial management
- Select & appoint chair

Refinement of prospectus, approval of question, define expertise appoint panelists

7 commissioned papers

External Review
- Reviewed recommended
- Published, translation
- Meeting

Recommend & Recruit External Reviewers

Progress report
- Sponsors

Approval, publication preparation, translation, meeting planning, dissemination

Invite panelists, refine question, comprehensive literature and expertise searches, panel meetings, draft assessment and related information, interview experts, identify areas where information is lacking, commission papers to fill gaps, obtain consensus on recommendations, address issues raised by external reviewers, help disseminate report.
The Remit

- Is there a “best way” (method) to evaluate the impacts of health research in Canada & are there ‘best metrics’ for assessing those impacts (or improving them)?

- Useful to a full range of funders/research types

- Compatible with what is already in place in Canada

- Transferrable to international comparisons

- Able to identify the full spectrum of potential impacts
The Approach

- Sponsor interviews by panelists to be certain of needs
- Literature review
- Expert interviews
- Seven commissioned papers in areas of special interest and/or perceived gaps:
  - Public perspective
  - Ethics
  - International frameworks
  - Pillar II, Pillar III, and Pillar IV research
  - ‘Meso-level’ metrics for impact
- Working Groups on panel
- Face-to-face meetings x 3
Expectations of Health Research

- Better health & greater life expectancy
- Improved quality of life
- Informed public policy on health-related issues across the full spectrum of government and private sector activity
- New commercial opportunities in & beyond Canada
- Increased attraction of the next generation to pursue careers in health research and the health sector
- Better “state of readiness” for unexpected threats to health that inevitably develop in contemporary world
Sponsor Expectations

**Framework Development**
- Cover all types of funding
- Cover long range and global impacts
- Understand evaluation work in place in Canada
- Must allow learning not just audit

**Metric Development**
- Cover non-monetary impacts too
- Metrics for human resources
- Metrics relevant to all four pillars
- Understand lag-times for impacts
- Understand knowledge translation
- Understand the attribution problem

**Evaluation issues**
- Metrics for commercialization
Many ‘Technical Complexities’

*Issues in Determining Health Research Impacts*

- **Attribution issues** (effects of things other than research) and the ‘counterfactual’ (what would have happened without the research being done)?
  - Need collaboration
  - Need research on those topics
- **Time lags to impact are very long**
  - Need indicators that can track longitudinally
- **Double-counting of health research impacts**
  - Need to determine contributions wherever possible
- **The ‘Halo effect’** (only consider positive impacts of research)
  - Need to consider negative impacts of research
Cross Pillar Research

Initiation and Diffusion of Health Research Impacts

Global Research

Canadian Health Research
- Biomedical
- Clinical
- Health Services
- Population and Public Health
- Cross-pillar Research

Research Capacity

Knowledge Pool

Health Industry

Other Industries

Government

Research Agenda

Public Information, Groups

Determinants of Health

Healthcare Appropriateness, Access, etc.

Prevention and Treatment

Improvements in Health and Well-being

Economic and Social Prosperity

Impacts feed back into inputs for future research

Advancing Knowledge

Informing Decision Making

Socio-Economic Benefits

Health Benefits

Capacity Building
‘Steps’ for Users of the Framework and Indicators

1. Define and prioritize specific evaluation question(s).
2. Use the framework to determine where to look for impacts.
3. Based on question(s) choose the impact categories (and subcategories) of interest: advancing knowledge, capacity building, informing decision making, health impacts, and broad economic and social impacts.
   a. Be as specific as possible about where impacts are expected to occur and at what level (individual, group, institution, provincial, federal, international).
   b. Choose (or develop) attractive and feasible indicators and metrics from the appropriate categories of interest that will address the evaluation questions at the right level.
4. Choose sets of indicators that are appropriate.
   Avoid inappropriate uses: attribution, Halo, counterfactual, double-counting.
Many Complexities
For e.g.: the (nearly) infinite number of potential evaluation questions

◆ Sample Questions from 1 funder & 1 program only:
  ● ? increased skill set Canadian health research
  ● ? increased number of skilled researchers
  ● Are our trainees producing high quality research?
  ● Are our trainees disseminating their findings to a variety of appropriate stakeholders?
What this framework can do

- With strategic selection of appropriate sets of indicators one can trace impacts within any of the four domains cutting across 4 research pillars.

- Also describe impacts at various levels: *individual, institutional, provincial, national, or international* & define ROI of funders by quantifying values of impacts as function of their investment.

- Breadth, depth, & framework flexibility fulfils sponsor-requested criteria to apply to full range of funders & research types, compatible with what exists in Canada, is transferable internationally & able to identify the full spectrum of potential impacts.
What this framework cannot do

- Guide evaluations: *does NOT provide questions*... or refine them
- Cannot resolve all complexities easily or immediately
  - If applied prospectively, it will take time and depending on the scope, it could become costly to apply it.
- Efficacy depends on selection of domains, indicator sets and data within indicators
  - to progressively resolve attribution, to achieve a balanced perspective, to avoid the Halo effect
  - Menu of 66 indicators *is only a start* – *more are required.*
- Balanced perspectives may not provide ‘black and white’ answers
Overview

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♦ Emergence of Return on Investment

♦ Impact of ROI

♦ Future Perspectives
Impact of Report

Multiple Websites References

1. Pan American Health Organization, PAHO/WHO disseminated a detailed e-mail to their list serve on March 4, 2009
2. The Primary Health Care Research & Information Service (PHC RIS) is a national primary health care organisation based at Flinders University in South Australia
3. Canadian Dental Association
4. Canadian Association of Occupational Therapists
5. Saskatchewan Health Research Foundation
6. Canadian Health Services Research Foundation
7. Association of Faculties of Medicine of Canada
8. Yahoo Finance
9. Reuters
10. Zibb Strictly Business
This report, supported by twenty-three Canadian health research organizations, demonstrates how research activity directly results in improvements to health, economic & social prosperity.

It also illustrates how "research impacts feed back upstream, potentially influencing the diffusion and impacts of other research, and creating inputs for future research."

CIHR will be harmonizing its impact framework with the CAHS proposed methods to measure returns on investment it makes in health research & measures that can be used to benchmark and gauge progress in realizing the value of health research.
Interview of Cyril Frank

Interview of Cyril Frank

Why is the assessment of the social impact of biomedical research important?

The assessment of the social impact of biomedical research is important for three major reasons: for accountability, for advocacy, and for learning. Let me explain each in turn. First, all those doing biomedical research generally require some type of financial and/or infrastructure support in order to conduct their work and as a result, they must be accountable to those who supported them. Whether this is in a public institution, in private industry or in a situation supported by a voluntary organization, there is a common need to report progress to those who provided the environment for the work to take place. At the highest level, those conducting research should also be able to report progress to members of the public who they ultimately serve in some fashion. Secondly, those involved in biomedical research should report their impacts for reasons of ‘research advocacy’, since the demonstration of progress against objectives can have a powerful influence of assessment being used by a number of health research funding organizations locally, provincially and nationally. While not every research in Canada assesses their research program, many would like to as evidenced by the large number of them who sponsored our Canadian Academy of Health Sciences Assessment on this topic. Based on discussions we have had over the past year, the national funders of health research, in particular, will likely collaborate in some way to assess their impacts as a collective. Since assessment of impacts complex and is intertwined with research world-wide, some international collaborations in this field are also being pursued.

Should specific measures to make stakeholders aware of the relevance of assessing the impact of research be taken? If this is the case, what kind of measures?

Catalonia is a community with limited resources, as compared with Canada, and with a shorter research tradition. The public or political demand for assessing the social impact of research seems to be small. What should the priorities of programs for assessing the impact of research be within this framework?

« In Catalonia, the assessment of research impact should begin with the research for which the highest return at short term is expected »
What is the ROI CAHS model and indicators about?*

- Useful common framework for any different type of health research (from basic research to health services)
- Useful for any stakeholder’s view (from funder to evaluator)
- Provides a set of generic indicators in the five impact levels:
  - Advancing knowledge (5 levels of indicators, 11 generic indicators)
  - Capacity building (5 levels, 7 generic indicators)
  - Informing decision-making (5 levels, 13 generic indicators)
  - Health impacts (3 levels, 14 generic indicators)
  - Broad economic and social impacts (5 levels, 11 generic indicators)

*Frank C and Neson E, Health research: measuring the social, health and economic benefits. CMAJ, MARCH 3, 2009; 180(5)
October 18 2015 – Google
Top 4 hits for Search: “ROI of health research”

- www.cahs-acss.ca/e/pdfs/ROI_Appendices.pdf
- [PPT]Download - Canadian Academy of Health Sciences
ROI Recommendations 2009

- All funders of health research in Canada should use the framework & indicators
- Begin collaborations immediately to advance practical prerequisites for measuring ROI
- National effort to measure the impacts of Canadian health research should begin
- Canadian health research funders should collaborate internationally to advance the “basic science of health research impacts.”
Future Challenges for ROI model applications

- Knowledge and applications of model
- Collaborations across organizations with nationally agreed-upon standards
- Care & feeding of indicator library
- Posing the “right questions”

Frank & Nason CMAJ 2009
The Future of Medical Innovation

- **4P** = *Predictive, Pre-emptive, Personalized, Participatory*

- Truly “personalized” medicine tailored to psychosocial modulators of motivation to engage: *not just* genetic & biologic profile

- Transdisciplinary approach needed: links medicine/science/law/ethics/economics/ behavioral & social sciences

- A “new social contract” between health care, medical innovation system and society

Horne et al Lancet 2015
Our national clinical research system is well-intentioned but flawed

- High percentage of decisions not supported by evidence*
- Health outcomes and disparities are not improving
- Current system is great except:
  - Too slow, too expensive, and not reliable
  - Doesn’t answer questions that matter most to patients
  - Unattractive to clinicians & administrators

We are not generating the evidence we need to support the healthcare decisions that patients and their doctors have to make every day.

Cycle of Quality *Informs Learning in Health Care*

- Discovery & Preclinical Science
- Measurement
  - Quantitative Network Development
  - Policy Assessment
  - Education
- Clinical Trials
- Clinical Practice Guidelines
- Education
- Performance Measures: *Registries*
- Process & Outcome Measures: *Populations*
- Realizing Unmet *Clinical Needs*
“Even if you are on the right track, if you just sit there you’ll get run over”

Will Rogers