

# Biomedical Research in Canada

1. A healthy and vibrant agenda is essential for improving the health of Canadians and developing a knowledge based economy.
2. Compared to all other OECD countries, Canada's investment in biomedical research is substantially lower.
3. All types of biomedical research are necessary and having a balanced portfolio of research funding is essential:
  - To discover better prevention and treatment strategies
  - To test them in people
  - To adapt discoveries to the Canadian Health System
4. Need a national funding and organizational strategy that is:
  - broad and world class
  - responsive to needs of Canadians (and peoples of the world)
  - develops Canadian expertise to improve health
  - brings in Partners

# Perspectives

- Discovery and invention are not the same as innovation and improving health
- Only 5% of discoveries in the laboratory translate into improved human health
- So investments across the entire spectrum of research endeavours and disciplines are critical to move ideas across from discovery to human health impact
- This is a long process which can take a decade or two

# Three Types of Discoveries That Have Dramatically Improved Human Health

## 1. Penicillin

-Petrie dish (Fleming)→ animal work→ limited scale synthesis→ human impact (Florey and Chain)

## 2. BP and Strokes

-Documentation that elevated BP caused strokes & heart attacks

-Development of drugs to lower BP

-Large randomized clinical trials show reduction of strokes, heart attacks and deaths with BP lowering

## 3. Tobacco is the No. 1 killer of adults (heart disease, strokes, cancers, lung disease): 100 million deaths in the 20<sup>th</sup> century;

1 billion deaths in the 21<sup>st</sup> century

-Discovery about its harms is *entirely based on population studies*

**CLINICAL & POPULATION SCIENCES BOTH FUNDAMENTAL & ESSENTIAL**

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# Canada's Funding for Health Research is Low Compared to Other Rich Countries

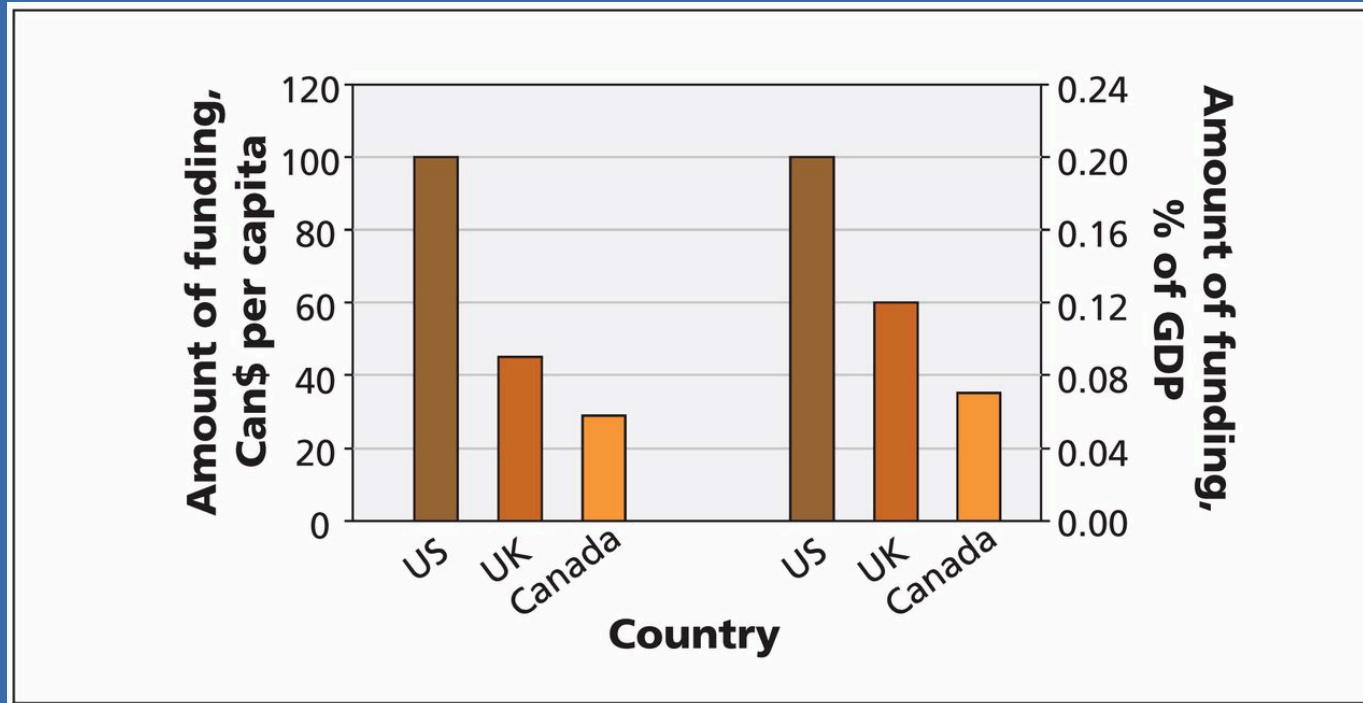
(Funding in 2012 : USD in billions)

	Overall	Public	Industry
USA	119.3	49	70
W. Europe	81.8	28	54
Japan	37.2	9	28
Australia	6.1	4.7	1.4
S. Korea	6.0	1.1	4.9
Canada	5.3	3.3	2.0

Chakma et al, N Engl J Med

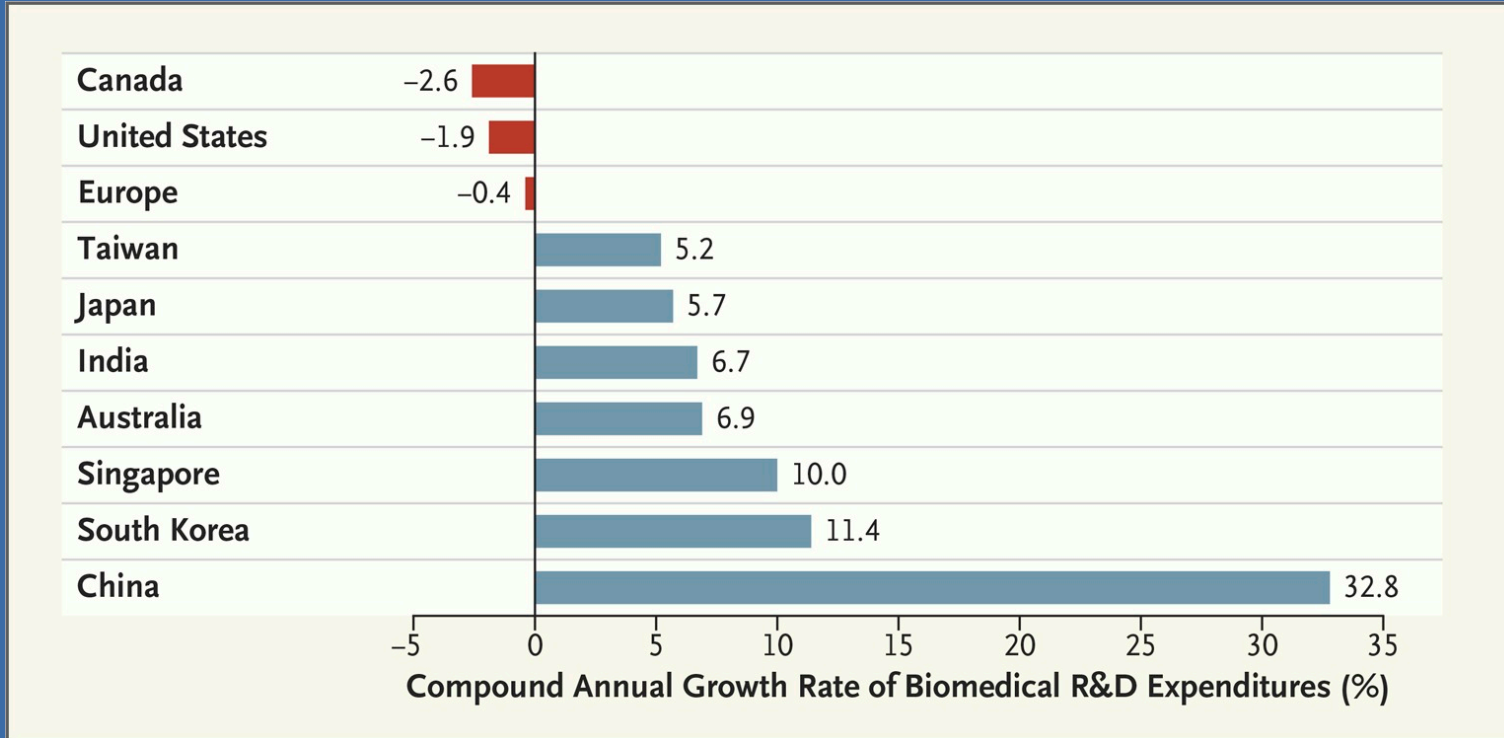
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# Federal Funding for Health Research



Yusuf & Cairns, CMAJ 2012

# Canadian Research Funding is Declining in Comparison with Other Countries (2007-2012)



# Canada's Funding for Research is Low & continues to decline vs Other Countries After Adjusting for GDP (2012 to 2017)

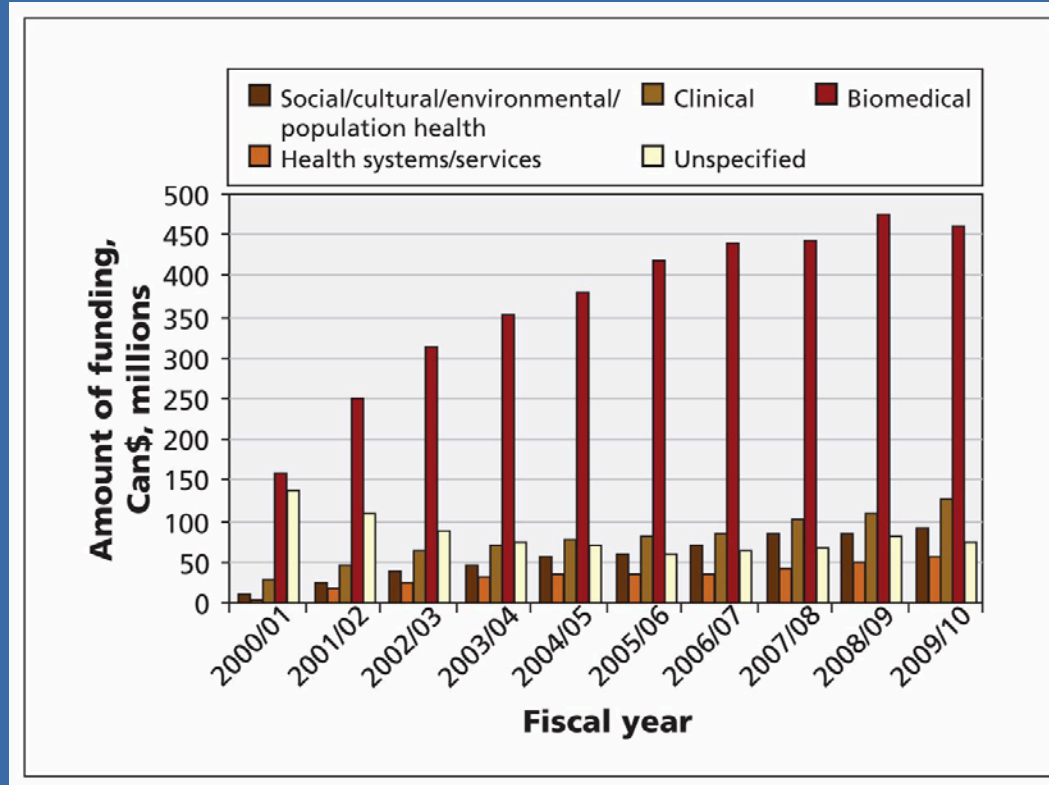
	GERD % GDP 2012	GERD % GDP 2016/2017
USA	2.7 % (2012)	2.7 % (2016)
OECD	2.3 % (2012)	2.3 % (2016)
Japan	3.2 % (2012)	3.1 % (2016)
Australia	2.9 % (2012)	3.1 % (2016)
S. Korea	4.0 % (2012)	4.2 % (2016)
<b>Canada</b>	<b>1.8 % (2012)</b>	<b>1.5 % (2017)</b>

GERD= Gross domestic spending in R&D. Adjusted for PPP (2010 US dollars)

OECD (2018)

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# Distribution of Federal Research Funds by Themes: Relative underfunding of clinical and population research





# Funding for Basic Biomedical & All Other Forms of Research

	Basic	All other Forms
NIH	55%	45%
UK	50%	50%
Canada	65%	35%

Yusuf & Cairns, CMAJ 2012

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# Percent of Federal Budget for Clinical Trials

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NIH (USA)	11%
UK-NIHR	20%-25%
CIHR	3.3%

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Yusuf & Cairns, CMAJ 2012

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# What is Needed?

1. A “new” body or a “new part” of CIHR for research other than basic biomedical with protected budgets
2. Target funding for each part to reach 1.5 billion dollars per year (total of 3.0 billion) in 5 years with appropriate long term growth
3. A bold & transformative national 25 year strategy to make Canadian research among the top 3 in the world, develop a sustainable science-based work force that will attract the best minds into science, improve health and galvanize our economy

# So What Needs to be Done in Canada?

1. Increase public spending substantially for all forms of research, particularly for clinical and population research.
2. Strive for a balanced portfolio with about equal support for basic Biomedical vs Other (Clinical, Population, Health Systems, Policy & Implementation).
3. Use public funding to leverage industry funding (1:1 or 1:2)
4. Need a transformed funding body, e.g. the UK model (2011)
  - MRC – basic biomedical : 1 billion pounds
  - NIH-R – clinical, population, etc : 1 billion pounds
5. Create national centres of excellence in various themes across the country