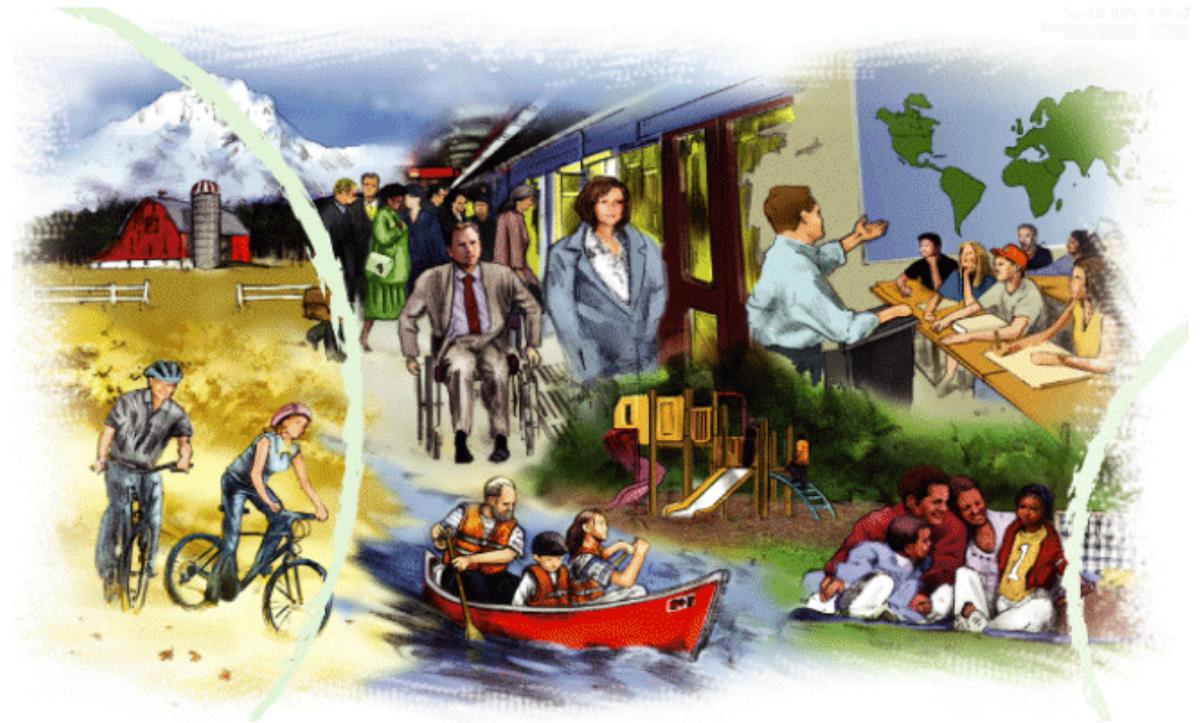


# National Research Priorities in Population and Public Health

**Beyond Borders  
Conference  
May 17<sup>th</sup>, 2007**



**BY John Frank, MD, CCFP, MSc, FRCP(C), FCAHS  
Scientific Director, CIHR - Institute of Population & Public Health**



# CIHR- Institute of Population & Public Health Mission Statement

## The CIHR-IPPH will support:

- ❖ research into the complex interactions (biological, social, cultural, environmental), which determine the health of individuals, communities, and global populations; and,
- ❖ the application of that knowledge to improve the health of both populations and individuals, through strategic partnerships with population and public health stakeholders, and innovative research funding programs.

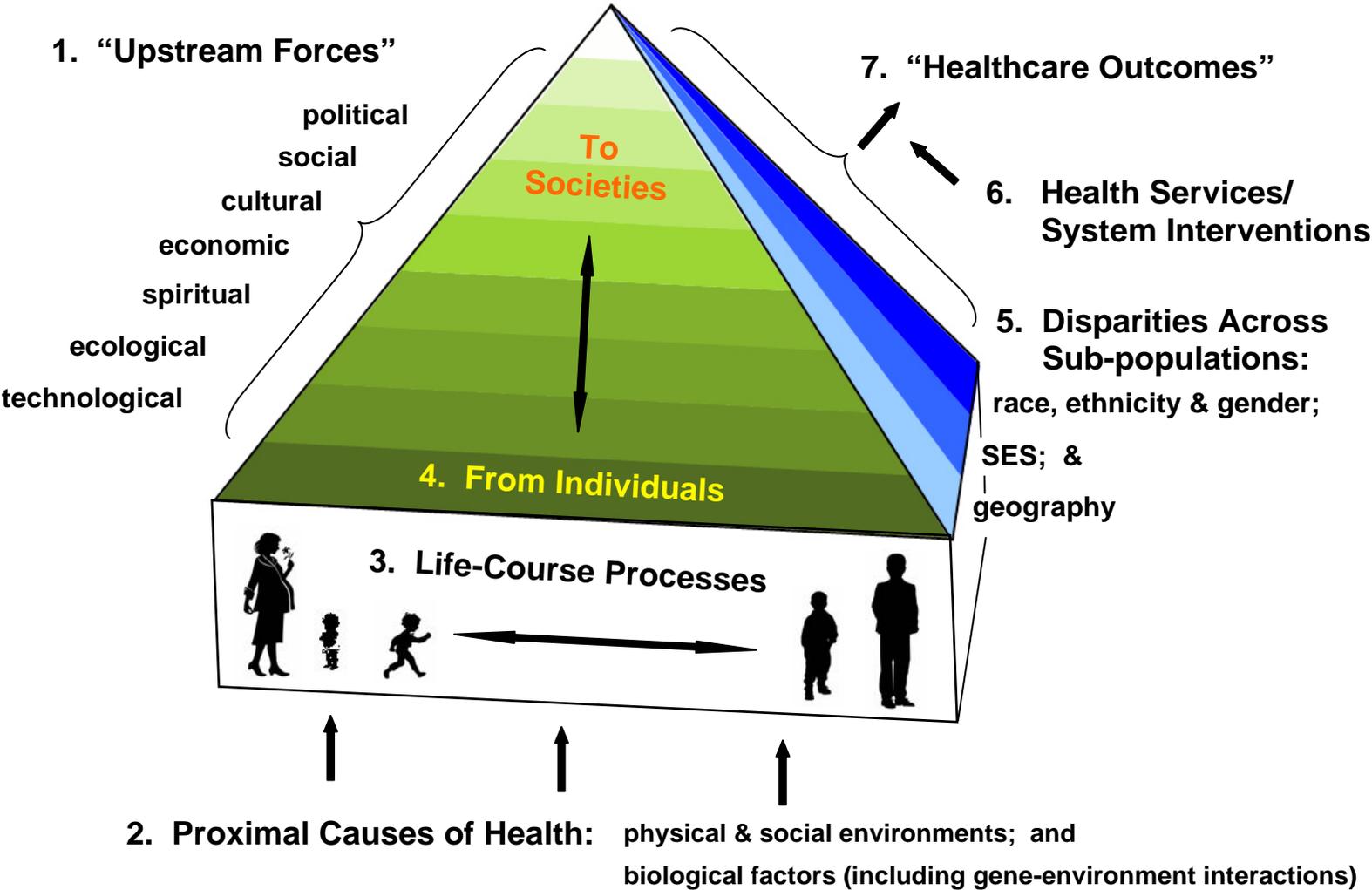


# IPPH Strategic Priority Areas In 2002-7

- ✎ Capacity building for cutting-edge and relevant PPH research and its application
- ✎ Understanding and addressing the impacts of physical and social environments on health
- ✎ Analyzing and reducing health disparities
- ✎ Global health (especially in resource-limited low- and middle-income countries)
- ✎ Characterizing gene-environment interactions to prevent disease



**Figure 1. CIHR-IPPH Conceptual Framework of Population Health**



# Capacity Challenges

- ❧ Researchers in academic vs. policy and practice settings – “the great divide”
- ❧ Disciplinary “silo-ing” of trainees still commonplace in research training programs
- ❧ “Old rules” of evaluating researcher productivity only by grants and publications (but some efforts to reform tenure and promotion criteria)
- ❧ Interaction with practice/policy settings still limited during training but this is changing



# Capacity Challenges (cont'd)

- ❧ Lack of incentives for new investigators to engage in knowledge transfer and exchange especially while in tenure track positions
- ❧ Inadequate “career ladders” for research *leadership* candidates: human capital lost
- ❧ Extent of support for researchers in practice settings



# Capacity Challenges (cont'd)

- 
- ✧ Those\* who need to be engaged/conduct/use/apply research evidence vary greatly in research appetite/values/expectations/time available/skills
    - \* Professionals and Practitioners; Program Administrators; Policy Makers; Community Groups and the Public
  - ✧ Major emphasis on collaborative planning and governance of research projects, especially for multi-year programs
  - ✧ Enormous interaction “costs” for researchers and research users – \$ from ??



# Responding to the Challenges

- ❧ Academia is responding in a variety of ways (e.g. professional masters of public health programs, schools of public health)
- ❧ Some doctoral, post-doctoral and mid-career salary award support dedicated to public health
- ❧ Support novel mechanisms and collaborations
  - ❖ Programs, centres and networks to support relevant PPH training, research and its application; and,
  - ❖ Creative inter-institutional arrangements to sustain long-term partnerships.



# 1. Centres for Research Development Objectives:

(as originally stated in the RFA)

- ❖ Better **position teams of researchers**, in newly emerging and less developed fields, for accessing open-competition (investigator-initiated) research funding;
- ❖ Promote **networking** and mentoring across researchers and existing institutions;
- ❖ Foster **meaningful interactions** with policy makers, public and voluntary sector program administrators, and clinical and public health practitioners;
- ❖ Create a sustainable path for the activities of Centres for Research Development, with committed multi-year funding; and, **facilitate capacity building in regions** of Canada with underdeveloped research strengths.



# Seven Centres for Research Development

1) Public health: Canadian centre for health and safety in agriculture (CCHSA)	Univ. of Sask.
2) Centre for urban health initiatives (CUHI)	Univ. of Toronto
3) Asthma in the workplace	Hôpital du Sacré-Coeur de Montréal
4) International collaborative centre for the study of social and physical environments and health	Univ. of Calgary
5) The changing physical and social landscape in Atlantic rural Canada	Dalhousie
6) Centre d'études et d'interventions sur les inégalités sociales de santé de Montréal	Université de Montréal
7) Reconfiguring physical and social environments to improve health: Research infrastructure development in Atlantic Canada	Dalhousie



# Catalytic Role of Centres

- 🌀 Strengthen linkages with policy makers and practitioners to create 'demand' for population and public health (PPH) evidence
- 🌀 Interdisciplinary PPH research and knowledge translation infrastructure in selected regions
- 🌀 Contribute to our global understanding of the impacts of physical and social environments of health
- 🌀 Increase intervention research capacity to improve the policies and programs that influence these environments
- 🌀 Create a 'fertile' training and mentoring ground for PPH research



## 2. Inaugural Applied Public Health Chairs Program (jointly funded by IPPH & Public Health Agency of Canada)

- ❧ Strengthen public health faculty at the mid-career stage
- ❧ Support high quality and focused **programs of policy and program intervention research** of national relevance to public health
- ❧ **Educate and mentor** the current and next generation of public health researchers (trainees, post-graduate students and junior faculty), practitioners and policy makers.
- ❧ Support Canadian universities to **develop graduate and continuing education programs in public health**
- ❧ **Foster formal linkages with the public health system** to support the effective application of research into policies, programs and practice.
- ❧ Stimulate **innovative approaches** in public health intervention research, education, mentorship and knowledge translation



# 3. Population Health Intervention Research Initiative for Canada (PHIRIC)

- ❧ Multi-year initiative intended to build capacity in population health intervention research – its quantity, quality and **use** by policy makers and practitioners.
- ❧ Population health intervention research involves the use of scientific methods to produce knowledge about policy and program interventions that operate within or outside of the health sector and have the potential to impact health at the population level.



### 3. Population Health Intervention Research Initiative for Canada (PHIRIC) - Progress to Date

Meeting of key stakeholders (Banff, Sept. 2006) to:

- ❧ Contribute to the development of a common understanding of population health intervention research
- ❧ Inform governance and management structure for PHIRIC
- ❧ Build network of champions for PHIRIC
- ❧ Inform development of strategic plan for PHIRIC



### 3. Population Health Intervention Research Initiative for Canada (PHIRIC) – Next Steps

- ❧ Further develop and seek input on strategic plan
- ❧ Expand management structure to include other perspectives/sectors – social sciences, health and learning, provincial (B.C., Québec, research funding organization perspective)
- ❧ Explore opportunities for synergy (e.g. disease specific strategies, aligning policy and program intervention funding with intervention research)
- ❧ Getting the Word Out:
  - ❖ IUHPE Symposium on PHIRIC
  - ❖ CPHA conference stream on intervention research
  - ❖ Can J of Public Health supplement on PHIRIC (in progress)



# Categories of Cause-Specific Mortality

## Amenable to Medical Care

Most infectious Dx's

Treatable cancers

Diabetes

Stroke

Asthma

Abd. Surg. Dx's

Kidney Disease

Perinatal & Obst Dx's

## Amenable to Public Health

Lung cancer

COPD

Cirrhosis

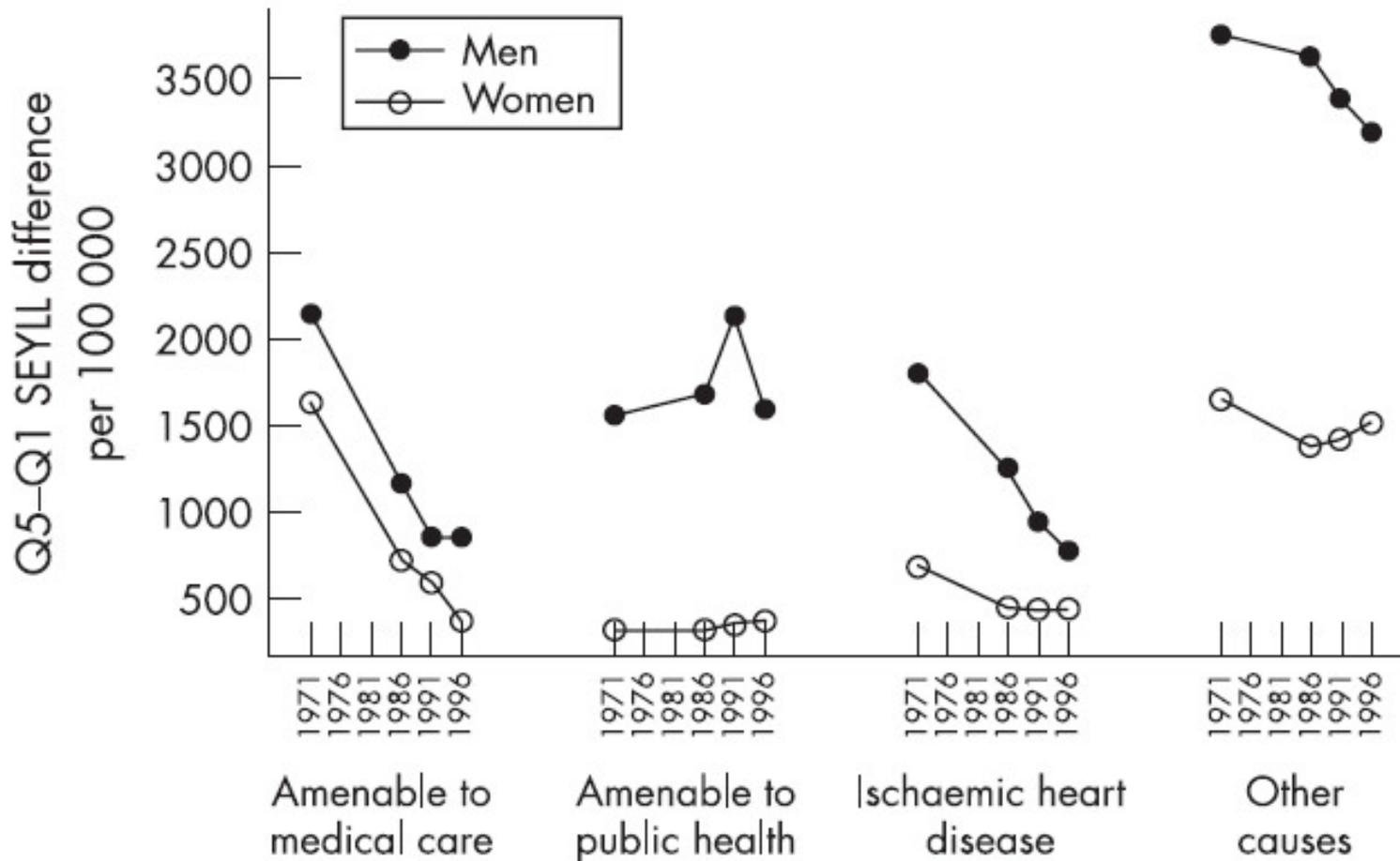
MVA's

HIV (pre-ART)

## Both

IHD





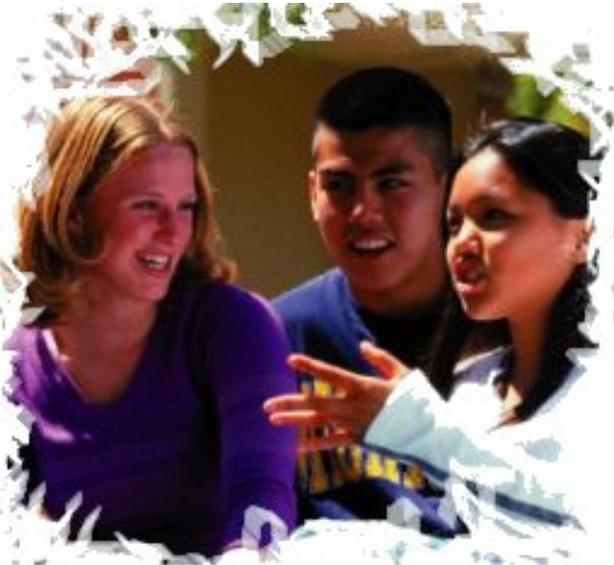
**Source:** James PD, Wilkins R, Detsky AS, et al. Avoidable mortality by neighbourhood income in Canada: 25 years after the establishment of universal health insurance. Figure 1. JECH 2007; 61:287-296.



# 4. Capacity Building for the Future Generation of PPH Researchers

## Summer Institute Core Objectives

- ❖ Foster the creation and maintenance of complex interdisciplinary research teams and their community/policy-maker/practitioner partners
- ❖ Provide a complementary training environment that is respectful of the perspectives, tools, and approaches of all disciplines
- ❖ Increase participants' understanding of different theoretical and methodological approaches to interdisciplinary and applied health research, their ethical considerations and application to policy, program and practice
- ❖ Offered annually since 2002



## 4. Capacity Building for the Future Generation of PPH Researchers cont'd.

- ❖ 2007 Summer Institute hosted by the Population Health Intervention Research Centre of the University of Calgary
- ❖ Theme: Increase quantity, quality and uptake of research about policy and program interventions that change the distribution of health risk in populations and tackle primary determinants of health
- ❖ Audience: mainly doctoral and post-doctoral students and some masters students
- ❖ Will showcase “best” practices in population health intervention research, investigate relevant issues such as ethics and community involvement and provide an opportunity to students to become acquainted with specific tools and methods



# 5. Building Public Health Services Research – New Opportunity

## Partnerships for Health System Improvement

- **Purpose:** Support teams of researchers and decision-makers interested in conducting applied health research useful to health system (including public health) managers and/or policy makers over the next two-to-five years
- Re-launch in June 2007 – 50% co-funded with partners (includes in-kind support)



## 5. Building Public Health Services Research – New Opportunity (cont'd)

### ∞ Illustrative examples of research domains:

- Effectiveness of public health human resource recruitment and retention approaches to improve access to quality public health programs and services;
- Financial analysis of public health service organizations, including current trends in expenditures and sources of funding, with an emphasis on the comparative analysis of benefits and risks of each major approach across Canada;
- Organizational skills and resources (e.g. information systems, program funding) required to deliver effective programs and services in different contexts; and,
- Assessing the role and capacity of public health organizations to support action on the social determinants of health.

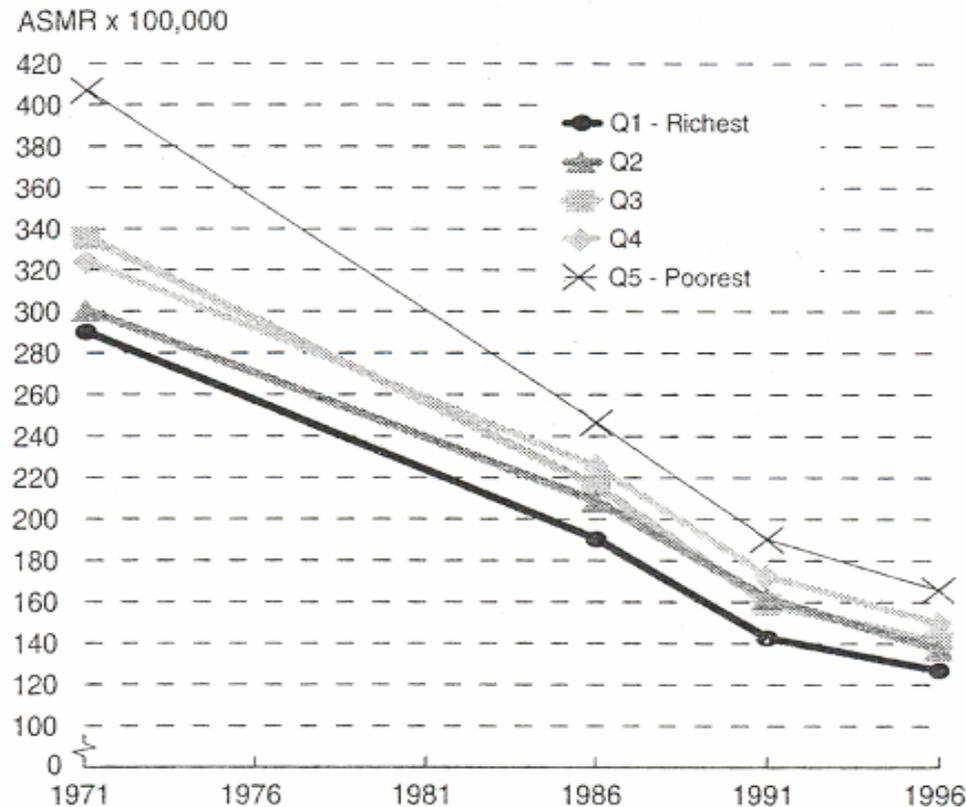


# Reducing Health Disparities



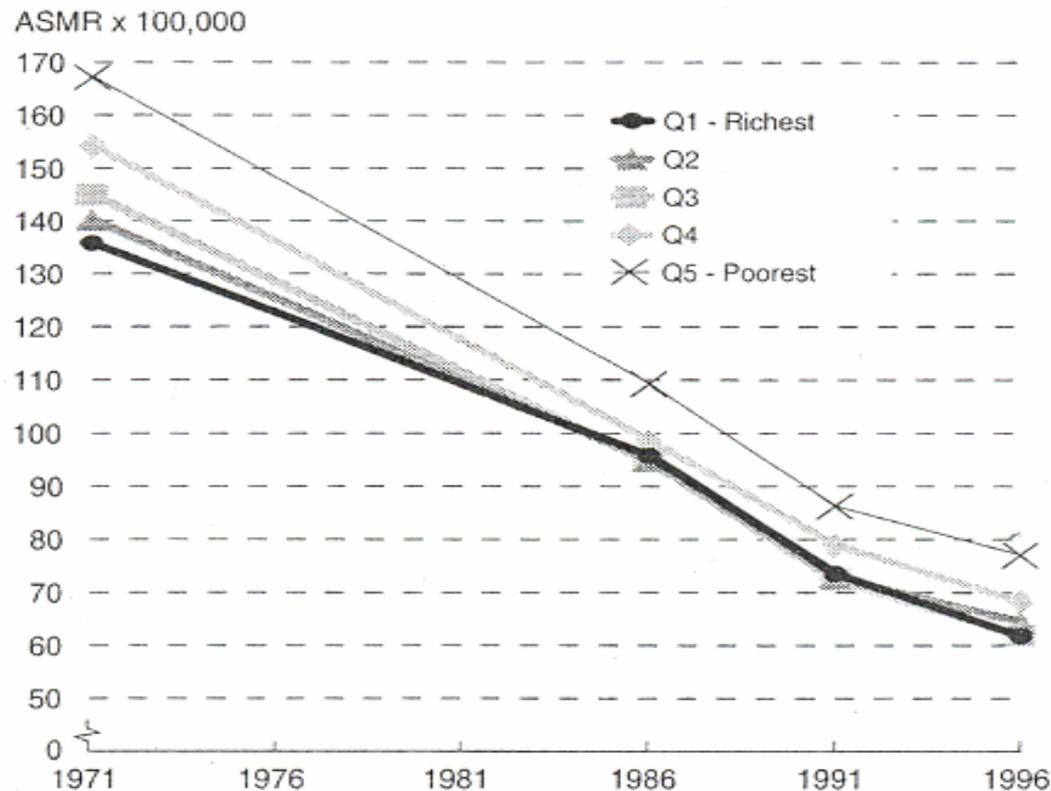
# Causes of death showing progress toward “Health for All” : Age-standardized mortality rates, by neighbourhood income quintile, urban Canada, 1971 to 1996.

## A - Ischemic heart disease, males



# Causes of death showing progress toward “Health for All” : Age-standardized mortality rates, by neighbourhood income quintile, urban Canada, 1971 to 1996.

## B - Ischemic heart disease, females



Source: Statistics Canada, Catalogue 82-003. Supplement to Health Reports, volume 13, 2002, p. 57.



# WHY Comprehensive Chronic Disease Surveillance?

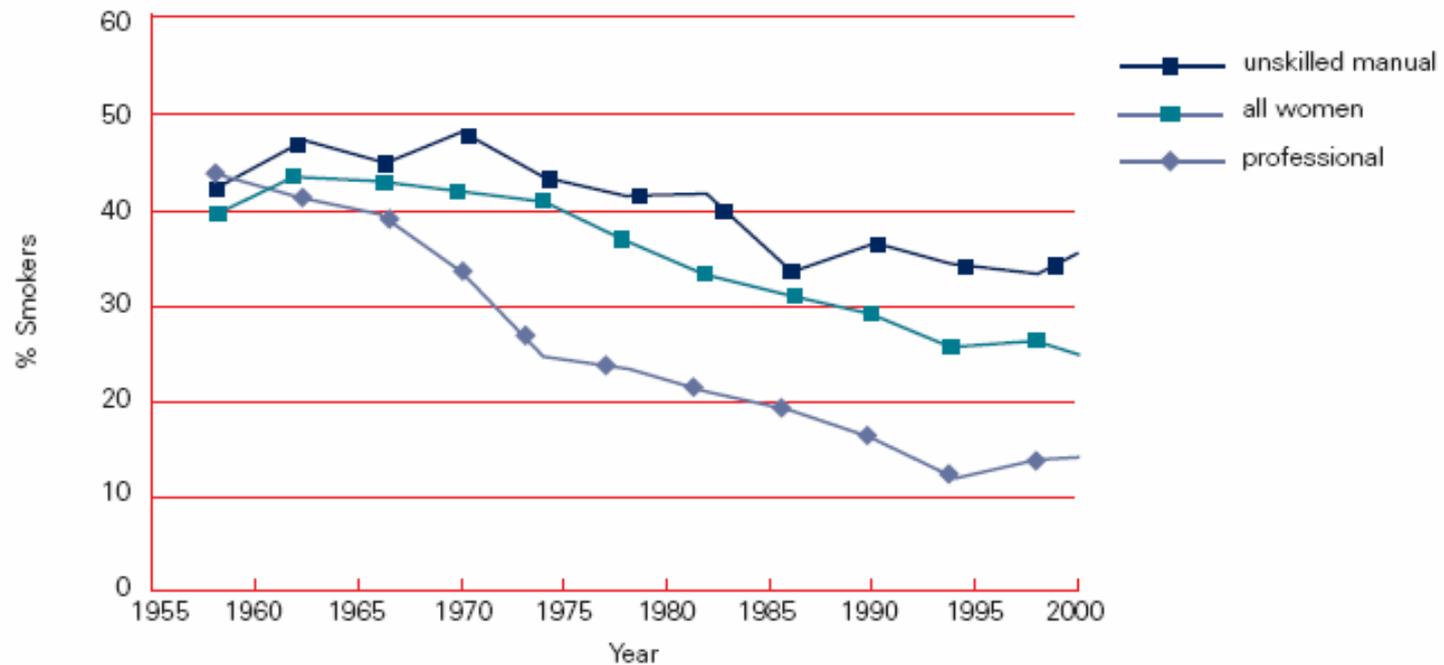
## Without it:

- We do not know whether to invest more resources in primary prevention; versus early diagnosis, prompt treatment and secondary (post-onset) prevention.
- We do not know which CVD risk factors need special attention, nor in which sub-populations.

*Source:* Enhancing capacity for surveillance of chronic disease risk factors and determinants: Advisory Committee on Population Health & Health Security; Surveillance Systems for Chronic Disease Risk Factors Task Group (June 2005).



**Figure 3: Cigarette smoking among women aged 16 and over by socio-economic group 1958-2000, Britain**



**Source:** Wald and Nicolaides – Bouman, 1993; Bridgwood et al, 2000

Smoking among the proportion of women who smoke has declined sharply but the gap in prevalence between poorer and better off groups is widening

ESRC Seminar Series Mapping the public policy landscape

Developing the evidence base for tackling health inequalities and differential effects

**Source:** <http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre>

# Knowledge Translation

**International Think Tank on Reducing Health Disparities (Sept 03)**

**Policy Forum on Health Disparities (March 04)**

**Syntheses Papers Published in the Canadian Journal of Public Health (March/April 05)**

**Research Policy Interface – Canadian Public Health Association (Sept 05)**

**Interdisciplinary Research and Policy Symposium- (March 06)**

**44 Interdisciplinary Research and Knowledge Translation Teams (2002-2011)**



# Global Health



# In the Works at the Global Health Research Initiative (GHRI) - Teasdale-Corti “Umbrella” Global Health Research Partnership Program

## Vision in the making:

- 10-year Program
- Complementary to existing efforts at national and international levels
- Demonstrating Canadian leadership in applied research on health systems and policies as well as public health
- Responding to the health priorities of low- and middle-income countries
- Engaging meaningful partnerships with existing and future stakeholders
- Being developed by GHRI partners, with input from other Canadian and developing country partners



# *In the Works at the GHRI - Teasdale-Corti* **Global Health Research Partnership Program**

## **GOALS:**

- 🌀 Strengthening Canada-Low and Middle-Income Country networks - Team Grants
- 🌀 Building Leadership Capacity - Global Health Leaders Grants
- 🌀 Knowledge to Action - Linking Research with Research-Users
- 🌀 Developing Innovative Programs that Meet Shifting Demands
- 🌀 Learning from the Program



# In the Works at the GHRI - Phase 1: Teasdale-Corti Team Grants

- 🌀 Developed by ALL partners
- 🌀 Expert, International Peer Review
- 🌀 IDRC-led
- 🌀 Huge response (259 Letters of Intent received)
- 🌀 Up to \$1.6M per team over a four year period (13 Team Grants funded)



# Global Health Teasdale-Corti Team Grant Recipients

**“Revitalising Health for All: Learning from comprehensive Primary Health Care Experiences”**

***Canada, Tanzania, Zimbabwe, South Africa, India, Nicaragua, El Salvador, Bolivia, Ecuador, Australia***

**“Unravelling the Emerging Childhood Obesity Epidemic in Mexico: The Nutrition Transition and the Double-Edged Sword”**

***Canada, Mexico***

**“Strengthening Nurses’ Capacity for HIV Policy Development in sub-Saharan Africa and the Caribbean”**

***Canada, Uganda, Kenya, South Africa, Jamaica, Barbados***



# Global Health Teasdale-Corti Team Grant Recipients (cont'd)

**“Veterinary public health as part of the global response to emerging diseases. Building a sustainable model in Sri Lanka with extension to South and Southeast Asia.”**

***Canada, Sri Lanka, Vietnam, Cambodia, India, Thailand, Bangladesh, Laos, Malaysia***

**“Équipe de Recherche interdisciplinaire sur la vulnérabilité et l'équité en santé en Afrique”**

***Canada, Mali, Burkina Faso***

**“Prevention, Care and Support for Vulnerable Populations at Risk for HIV/STI in Shanghai, China”**

***Canada, China***



# Global Health Teasdale-Corti Team Grant Recipients (cont'd)

**“Political violence, natural disasters and mental health outcomes: Developing innovative health policies and interventions”**

**Canada, Guatemala, Nepal, Peru and Sri Lanka**

**“Caribbean Eco-Health Programme: Public and Environmental Health Interactions in Food and Water-borne Illnesses”**

**Canada, St. Lucia, Trinidad and Tobago, Guyana, Suriname**

**“Research, Policy and Practice With Regard to Work-Related Mental Health Problems in Chile: A Gender Perspective”**

**Canada, Chile**

**“Poor land use and poor health: Primary prevention of ill human health through sound land use for small-scale farmers of the humid tropics”**

**Brazil, Canada**



# Global Health Teasdale-Corti Team Grant Recipients (cont'd)

**“Increasing Capacity to Achieve Millennium Development Goal # 6 in Honduras: Combating Infectious Diseases**

***Canada, Honduras***

**“Researching Equity in Access to Health Care (REACH)”**

***Canada, South Africa***

**“Paediatric pain management in urban and rural Thailand”**

***Canada, Thailand***



# Studying Genetic and Environmental Contributions to Disease Causation



# Studying Genetic and Environmental Contributions to Disease Causation: An Uneven Playing Field

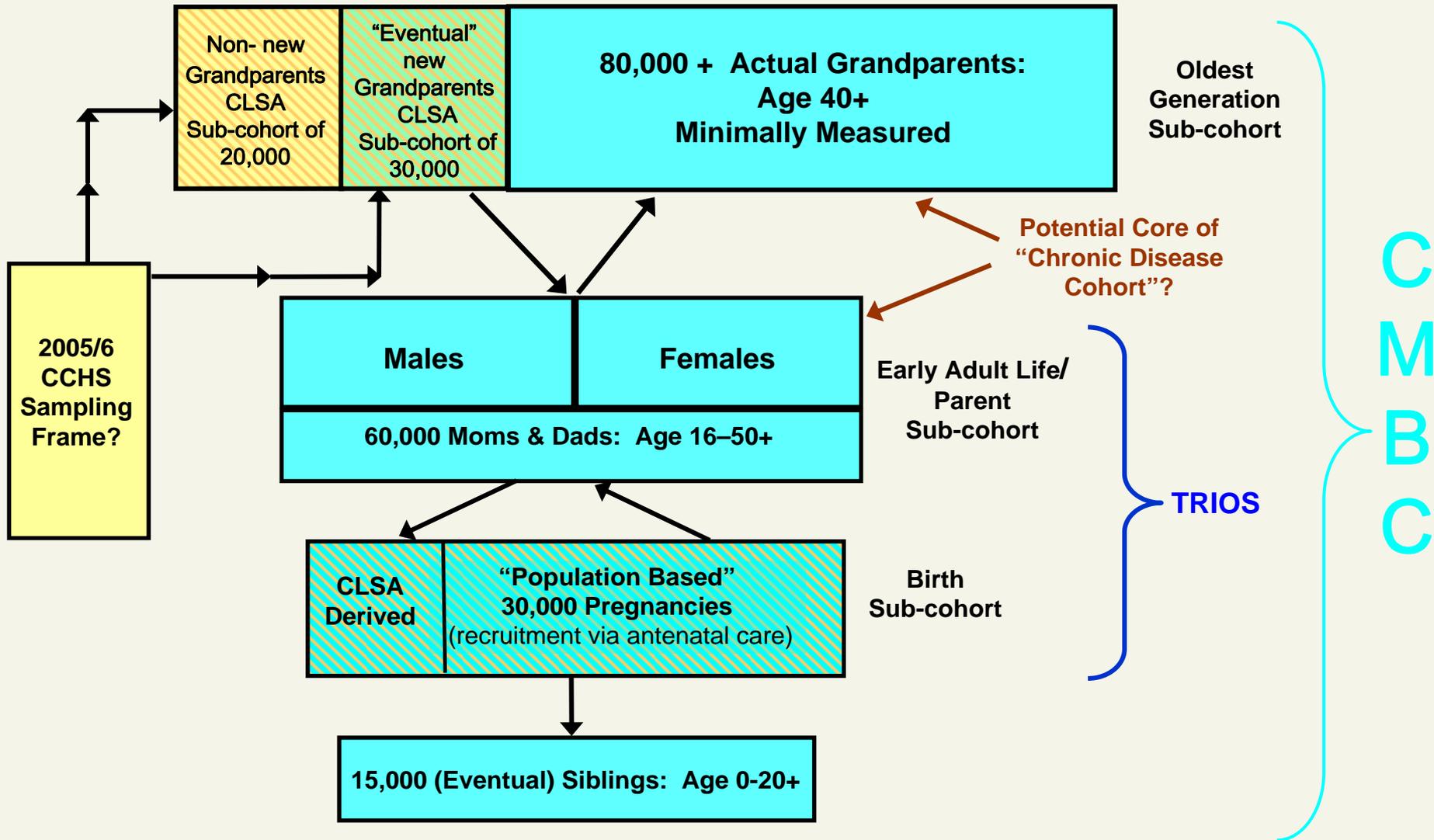
Measurement Attribute	Genetic Exposure Measures	Environmental Exposure Measures
<b>Time-varying?</b>	<b>No</b> – one sample per lifetime is enough (unless gene expression arrays are used)	<b>Yes</b> – new samples needed whenever exposure changes
<b>Data Collection Costs</b>	<b>Cheap</b> (on a sample)	<b>Expensive</b> (real-time assays)
<b>Sample Storage</b> (for later analysis)	<b>Easy</b> (buccal swab, buffy coat)	<b>Difficult</b> (e.g. air/water/diet samples)
<b>Data Analysis Costs</b>	<b>Getting cheaper by the day</b>	<b>Getting Costlier</b> (as awareness of chemical / physical / biological complexity increases)
<b>Overall Ease &amp; Cost of Accurate Ascertainment</b>	<b>Easy / Cheap</b>	<b>Difficult / Costly</b>



# Comparison of “Huge, Data-Thin” Cohorts And “Small, Data-Thick” Cohorts

Cohort Attributes	Huge – Data-Thin	Small – Data-Thick
<b>Cost per subject</b> (Due to sample size)	<b>Low</b> (e.g. < \$500. / data-wave)	<b>High</b> (e.g. > \$1,000. / data-wave)
<b>Sample size:</b> (Due to choice of exposures and outcomes)	<b>≥ 500,000</b>	<b>&lt; 30,000</b>
<b>Exposures</b>	<b>Cheap-to-collect /store /measure – e.g. genetic and “tombstone” demographics plus possible one-off self-reported exposures</b>	<b>Expensive, balanced mix of environmental and genetic measures</b>
<b>Outcomes</b>	<b>Cheap-to-collect administrative data – e.g. hospitalizations for diagnoses /deaths</b> (dichotomous, forcing huge sample sizes)	<b>Complex biological, clinical and functional direct measurements</b> (often continuous, allowing reduced sample sizes)
<b>Leading to “exposure-measure bias”</b>	<b>Large environmental exposure error, much greater than genetic factor errors</b>	<b>“Better balanced errors” for environmental versus genetic factors</b>
<b>Leading to:</b>	<b>Biased main effects and interaction results</b>	<b>Less biased results</b>

# One Possible Integrated CLHI Option (No Pre-Conceptual Accrual)



 – Intensively measured sub-cohorts

# Estimated Minimum Costs of this Design

## ❁ “Core” CMBC/CLSA Thick-Data Cohorts of Newborns and over-40’s

- intensively measured, more than once, @ \$2,000<sup>00\*</sup> each, over first 5 yrs.

➤ (n = 30,000 newborns + 30,000 over-40’s) x \$2,000<sup>00</sup>  
= \$120 million over five yrs.

## ❁ “Add on” CMBC Parent/Grandparent/Sib Thinner-Data Cohorts

- minimally measured, one time, @ \$500<sup>00‡</sup> each, over first 5 yrs.

➤ (80,000 remaining GPs + 60,000 Parents + 15,000 Sibs) x \$500<sup>00</sup> = \$77.5 million over first 5 yrs.

➤ **Grand Total:** \$197.5 million

➤ Note that cost of visits to home addresses of newborns and grandparent/s are already covered.

\* \$2,000<sup>00</sup> is likely underestimate – compare CPM Survey: ? \$5,000 for first data collection, per subject, although economies of scale not maximized at this n.

‡ \$500<sup>00</sup> might cover one interview, very basic physical examination (eg. wt., ht. bp) + blood/urine/etc. sampling x 1/storage (once basic infrastructure costs are covered).

# Where Do We Go from Here?

- ❧ Continue to build interdisciplinary research capacity to understand and address through effective policy and program interventions such complex population and public health problems
- ❧ Continued emphasis and resources to support knowledge exchange activities and meaningful engagement of decision-makers and other stakeholders
- ❧ No one organization can do this alone:
  - ❧ Need to influence incentive structures in research, policy and practice settings

