CIHI Trends in Health Inequalities in Canada

APHEO
September 15, 2014
Outline and Objectives

• Introduction to CIHI and CPHI
• Work in Health Inequality
• Trends in Health Inequalities Project
• Questions / Comments
## Our Strategic Plan

### Our Vision

### Our Mandate
To lead the development and maintenance of comprehensive and integrated health information that enables sound policy and effective health system management that improve health and health care.

### Our Values
Respect, Integrity, Collaboration, Excellence, Innovation

<table>
<thead>
<tr>
<th>Strategic Goals</th>
<th>Priorities</th>
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<tbody>
<tr>
<td>Improve the comprehensiveness,</td>
<td>- Provide timely and accessible data connected across health sectors</td>
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<tr>
<td>quality and availability of data</td>
<td>- Support new and emerging sources of data, including electronic records</td>
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<tr>
<td></td>
<td>- Provide more complete data in priority areas</td>
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<tr>
<td>Support population health and</td>
<td>- Produce relevant, appropriate and actionable analysis</td>
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<tr>
<td>health system decision-making</td>
<td>- Offer leading-edge performance management products, services and tools</td>
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<td>- Respond to emerging needs while considering local context</td>
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<td>Deliver organizational excellence</td>
<td>- Promote continuous learning and development</td>
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<td>- Champion a culture of innovation</td>
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<td>- Strengthen transparency and accountability</td>
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</tbody>
</table>

### Foundation
Privacy and Security, Data Standards and Quality, Information Technology, Partnerships
Why Examine Trends in Health Inequality?

• Health inequality is large and has policy significance
• Recognized internationally through Rio Declaration on the Social Determinants of Health, adopted in 2011
• Increasing federal, provincial and local level analysis documenting the extent of inequalities
  – E.g., CIHI 2013 Health Indicator report - 15 indicators reported by neighborhood income level by province
Trends in Health Inequalities in Canada: Research Questions

1. To what extent have income-related health inequalities changed over time in Canada?

2. What are some promising policies and interventions that have been shown to reduce income-related health inequalities?
Organization and Scope of the Report

### Structural
- Income
- Education
- Occupation

### Intermediary
- Material (core housing, food insecurity)
- Early Life (small for gestational age, EDI)
- Behaviours & Biology (smoking, obesity)
- Health System (immunization in seniors, ACSC, mental illness hospitalizations)

### Health & well-being outcomes
- Avoiding Illness & Injury (falls in seniors, motor vehicle hospitalizations, alcohol-attributable hospitalizations, diabetes prevalence)
- Living well & living longer (self-rated mental health, infant mortality)
Why these indicators?

- Trend data available at the pan-Canadian level
- Leading causes of mortality and morbidity
- SES-gradient
- Sufficient sample size (for survey data) at different levels of disaggregation
- Survey questions consistent across CCHS cycles
- Consultation with expert working group
Data Sources

– CIHI data holdings (DAD, HMDB, OMHRS, etc.)

– Statistics Canada
  • Census
    – Population counts from post-censal estimates
    – Neighborhood income quintile
  • Canadian Community Health Survey (CCHS)
  • Vital Statistics

– Offord Centre (Early Development Index)
Indicator Analysis

- Age-standardized to Canadian 2011 population
  - Rates by income quintile over time
    • overall and by sex: national and provincial
  - Two measures comparing the lowest (Q1) and highest (Q5) income quintiles:
    • Disparity Rate Ratio (DRR): Q1/Q5 (relative)
    • Disparity Rate Difference (DRD): Q1-Q5 (absolute)
Indicator Analysis (cont’d)

– Two measures taking into account the entire distribution

  • **Potential Rate Reduction** (PRR) (relative)
  • **Population Impact Number** (PIN) (absolute)
# Methodological Considerations

<table>
<thead>
<tr>
<th>Data Source</th>
<th>CIHI Hospital Data</th>
<th>Statistics Canada - Canadian Community Health Survey (CCHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type</td>
<td>Administrative hospital discharge abstracts</td>
<td>Self-reported survey data</td>
</tr>
<tr>
<td>Collection method</td>
<td>Continuous data collection reported by fiscal year</td>
<td>Sample data collection on annual or biennial cycle</td>
</tr>
<tr>
<td>Case selection</td>
<td>Case selection using diagnosis codes (WHO–ICD-10 CA)</td>
<td>Defined based on survey responses</td>
</tr>
<tr>
<td>Income measure</td>
<td>Area-based (neighborhood) income based on patient’s place of residence</td>
<td>Self-reported income</td>
</tr>
<tr>
<td>Variance</td>
<td>Standard formula for binomial distribution</td>
<td>Bootstrap sampling for variance estimation</td>
</tr>
</tbody>
</table>
Policy Methods – Intervention Selection

Key considerations
- SES-oriented
- Evaluated
- Canadian
- Uptake
Policy Methods - General Considerations for Addressing Health Inequality

• Comprehensive “package” to address health inequality
• Universal and targeted approaches
• Need to address multiple risk factors
• Inter-sectoral action
  – Health in all Policies
Trends in inequality in...

Intermediary determinants

• Health System
  - ACSC (administrative data)

• Behaviours & Biology
  - Obesity (survey data)
ACSC Hospitalization – What is it?

Rate of hospitalization for ambulatory care sensitive conditions among Canadians aged 0-75 years

- Measures an important goal of health system performance: access to effective primary care
- A composite of 7 smaller dots (i.e. chronic condition hospitalizations)
- In 2011/12 – 108,128 hospitalizations
- Over $600 million in inpatient costs per year
- 6% of all inpatient visits
- 11% of total hospital days
- “potentially avoidable”
ACSC Hospitalization Rates by Income, Canada, 2001-2012

Overall, rates are decreasing

Inequality appears to be persisting

How do we interpret this? Good or bad?

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2012</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Age-std rate</td>
<td>543</td>
<td>354</td>
<td>-35*</td>
</tr>
<tr>
<td>Disparity Rate Ratio</td>
<td>1.94*</td>
<td>2.27*</td>
<td>17</td>
</tr>
<tr>
<td>Disparity Rate Difference</td>
<td>362*</td>
<td>298*</td>
<td>-18</td>
</tr>
<tr>
<td>PRR (%)</td>
<td>29.5*</td>
<td>34.2*</td>
<td>16</td>
</tr>
</tbody>
</table>

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Challenges with reporting inequalities

- Inequality can increase or decrease for different reasons
- Relative or absolute scale
- Time trends in relative and absolute inequality can be different or even opposing
- The size of relative and absolute inequality depends on range of indicator
Disparity Rate Ratio (DRR) and Disparity Rate Difference (DRD) for ACSC Hospitalization Rates by Income, Canada, 2001-2012

Inequality decreasing on absolute scale and increasing on relative scale
ACSC Hospitalization Rates by Income, by Sex, Canada, 2001-2012

<table>
<thead>
<tr>
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<th>2001</th>
<th>2012</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Age-std rate</td>
<td>619</td>
<td>392</td>
<td>-37*</td>
</tr>
<tr>
<td>Disparity Rate Ratio</td>
<td>1.89*</td>
<td>2.30*</td>
<td>22</td>
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<tr>
<td>Disparity Rate Difference</td>
<td>395*</td>
<td>336*</td>
<td>-15</td>
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<tr>
<td>PRR (%)</td>
<td>28.7*</td>
<td>34.8*</td>
<td>21</td>
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</tbody>
</table>

* p<0.05

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2012</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Age-std rate</td>
<td>472</td>
<td>317</td>
<td>-33*</td>
</tr>
<tr>
<td>Disparity Rate Ratio</td>
<td>2.04*</td>
<td>2.26*</td>
<td>11</td>
</tr>
<tr>
<td>Disparity Rate Difference</td>
<td>339*</td>
<td>266*</td>
<td>-22</td>
</tr>
<tr>
<td>PRR (%)</td>
<td>31.2*</td>
<td>33.8*</td>
<td>8</td>
</tr>
</tbody>
</table>

* p<0.05
ACSC Rates by Income for select provinces, 2001-2012
ACSC Inequality – Trends Among the Little Dots

- COPD
- Heart Failure
- Diabetes
- Angina
- Asthma
- Epilepsy
- Hypertension
Obesity Rates by Income, Canada, 2003-2013

Rates of obesity increasing

439,600 fewer Canadians would have obesity if rates were at Q5 level for everyone

Inequality?

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<thead>
<tr>
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<th>2003</th>
<th>2013</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Age-std rate (%)</td>
<td>15.4</td>
<td>18.6</td>
<td>21*</td>
</tr>
<tr>
<td>Disparity Rate Ratio</td>
<td>1.27*</td>
<td>1.14*</td>
<td>-10</td>
</tr>
<tr>
<td>Disparity Rate Difference (%)</td>
<td>3.7*</td>
<td>2.4*</td>
<td>-35</td>
</tr>
<tr>
<td>PRR (%)</td>
<td>11.7*</td>
<td>8.6*</td>
<td>-26</td>
</tr>
</tbody>
</table>

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Obesity Rates by Income, by Sex, Canadian provinces, 2003-2013

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2013</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Age-std rate (%)</td>
<td>16.0</td>
<td>20.0</td>
<td>25*</td>
</tr>
<tr>
<td>Disparity Rate Ratio</td>
<td>1.11</td>
<td>0.95</td>
<td>-14</td>
</tr>
<tr>
<td>Disparity Rate Difference (%)</td>
<td>1.6</td>
<td>-1.0</td>
<td>-163</td>
</tr>
<tr>
<td>PRR (%)</td>
<td>5.5</td>
<td>0.2</td>
<td>-96</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2013</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Age-std rate (%)</td>
<td>14.6</td>
<td>17.2</td>
<td>18*</td>
</tr>
<tr>
<td>Disparity Rate Ratio</td>
<td>1.54*</td>
<td>1.51*</td>
<td>-2</td>
</tr>
<tr>
<td>Disparity Rate Difference (%)</td>
<td>6.1*</td>
<td>6.7*</td>
<td>10</td>
</tr>
<tr>
<td>PRR (%)</td>
<td>22.2*</td>
<td>24.1*</td>
<td>9</td>
</tr>
</tbody>
</table>

* p<0.05
Obesity Rates by Income in ON and NS, 2003-2013

Men

Women
Policy and Interventions to Reduce Inequalities in Obesity

• Traditional “downstream” interventions to reduce obesity focus on individual-level behaviour change

• Such approaches can exacerbate disparities because they tend to be more effective among persons with higher SES

• “Upstream” or structural interventions (e.g. policy, physical environment), as well as those of longer duration, appear to be effective among low-SES groups

• Examples:
  – Comprehensive school-based health promotion programs
  – Restriction on marketing of unhealthy foods to children
## Summary of Selected Key Findings

<table>
<thead>
<tr>
<th>Indicator (national)</th>
<th>Time period</th>
<th>DRR (relative)</th>
<th>DRD (absolute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>2003-2013</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ACSC Hospitalization</td>
<td>2001-2012</td>
<td>↑</td>
<td>↓</td>
</tr>
<tr>
<td>Smoking</td>
<td>2003-2013</td>
<td>↓</td>
<td>-</td>
</tr>
<tr>
<td>Motor vehicle hospitalization</td>
<td>2001-2012</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- No significant change between first and last time point
- Statistically significant increase
- Statistically significant decrease
Preliminary Key Messages

• Income-related inequalities have persisted over time for the majority of indicators examined

• National trends provide a picture of overall inequalities in health; however, they often mask important gender and provincial variations

• Composite indicators mask trends in specific indicators

• Health inequality monitoring needs to take into account differences in prevalence/incidence across populations and over time

• Health inequality monitoring should be based on relative and absolute changes over time
Next Steps

• Trends in Health Inequalities Report
  – Suite of products, including technical report
  – Target release date: early 2015

• Trends in Health Inequalities, Future Work
  – Methodology review of additional inequality measures and formal trend analysis
  – Stakeholder engagement and needs assessment
  – Capacity building and dissemination
Questions or Comments?

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Thank You
Discussion

• Masked inequality
  – Indicators are intended to raise questions: there is always a need to unpack and disaggregate because important differences might be masked
  – e.g., ACSC differences by specific ACSCs are masked by using the composite indicator (trade-off between parsimonious reporting with a big dot vs more informative reporting of the little dots)
  – e.g., Obesity - national both sexes combined results mask important sex differences
Extra Slide 1

- Income measurements
  - Neighbourhood income quintile
  - CCHS income quintile
  - Missing income group (Don’t know, Refused to answer)
    - Categorised as quintile 0 for CCHS indicators