PROVINCE-LEVEL INCOME INEQUALITY AND HEALTH OUTCOMES IN CANADIAN ADOLESCENTS

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OUTLINE

- Background
- Objectives
- Methods
- Results
- Conclusions and Implications
Defined as the scale of income distribution in a society

Measured by:
- Gini coefficient
- Coefficient of variation
- Robin Hood index
- Median share
- Top 20%: bottom 20%

Gini = A/(A+B)
BACKGROUND: INCOME INEQUALITY AND HEALTH

- **Social comparison pathway**
  - Income inequality leads to low social capital and stressful social comparison, which affect health through psychological processes and physiological changes
  - (Wilkinson, 1997; Wilkinson & Pickett, 2009)

- **Policy pathway**
  - Income inequality is related to social and health policies (health care, welfare spending, child care, tax policy, and unemployment compensation) which may be related to health
  - (Subramanian & Kawachi, 2004)
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- Lower than United States, United Kingdom, Italy, Australia, Japan
- Higher than Switzerland, Ireland, France, Sweden, Denmark, and others

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BACKGROUND: PREVIOUS RESEARCH

- Between-country effects:
  - Health Behaviour in School-aged Children study, country-level inequality
    - Self-related health; Torsheim et al., 2006
    - Alcohol use (young adolescents only); Elgar et al. 2005
    - Life satisfaction (steeper gradient); Levin et al., 2011

- Within-country effects:
  - United States, state-level inequality
    - Obesity; Singh et al., 2008
    - Physical activity levels; Singh et al., 2009
    - Birth-control usage (univariate only); Crosby et al., 2003
Only a few multi-level studies on income inequality and adolescent health

- Some have not adequately controlled for state/country mean income
- Single adolescent health outcomes; less on mental health outcomes
- Less known about within-country effects, especially in more equal countries
OBJECTIVE

- To examine the effect of province-level income inequality on health outcomes in Canadian adolescents using a within-country design.
METHODS: DATASET

- National Longitudinal Survey of Children and Youth (NLSCY)
- 0-11 years in original cohort, 1994-1995
- To capture all between ages 12-17 years
  - Cycle 4, 2000-2001 ($n=5,580$)
  - Cycle 7, 2006-2007 ($n=6,319$)
METHODS: SES MEASURES

- **Individual-level: from NLSCY**
  - *Household income* (before taxes and transfers) from all sources of income for all family members during the previous 12 months
  - *Parental education* (years) was derived from questions about the highest level of education attained for parent and spouse

- **Province-level: from the Canadian Socio-economic Information Management System database**
  - *Income inequality* was measured using the Gini index based on household income after taxes and transfers, adjusted for household size
  - *Mean income* was measured as the average household income after taxes and transfers, adjusted for household size
19 health outcomes

- Self-rated health
- Mental health: self esteem, indirect aggression, physical aggression, emotional disorder, hyperactivity/inattention, prosocial behaviour, property offences
- Health behaviours: television watching, physical activity, breakfast eating
- Substance use behaviours: alcohol use, cigarette use
- Physical health: limiting condition, injuries, chronic conditions, body mass index, general symptoms, sleep difficulties
Multiple imputation for partial non-response; used unweighted data

Multi-level modeling: participants nested within province/year

Hypotheses + Analyses
1. Higher income inequality related to poorer adolescent health outcomes
   → Main effects of province income inequality
2. Stronger associations between family SES and adolescent health in more unequal provinces
   → Cross-level Interactions

Covariates: province mean income, household income, parental education
RESULTS: MAIN EFFECTS

- **Main effect hypothesis**
- **Main effect findings**
  - Higher income inequality associated with
    - More injuries
    - More general symptoms
    - More life-limiting conditions
  - Not associated with
    - Self-rated health
    - Mental health
    - Health behaviours
    - Substance use behaviours
RESULTS: INTERACTIONS

- Interaction hypothesis

- Interaction findings
  - Steeper SES gradients in health in more unequal provinces for
    - Life-limiting conditions
    - Physical aggression
    - Hyperactivity/inattention
    - Property offences
  - Less steep SES gradients in health in more unequal provinces for
    - Cigarette use
CONCLUSIONS

General conclusions:
- Few main effect associations for province-level income inequality in Canadian adolescents
- Some evidence of interaction with family SES for mental health, especially externalizing conditions

Limitations
- Cross-sectional
- Variability in income inequality across provinces
- Self-reported health outcomes
Theoretical implications

- Policy pathway:
  - Safety guidelines, access to special education, mental health care
- Social comparison pathway:
  - Social cohesion/Crime

Future directions

- Level of measurement of income inequality – school, neighbourhood, province/state, country
- Longitudinal design
- Interactions between income inequality, family SES, subjective SES
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