The rising pain prevalence among US and Canadian Adults

Anna Zajacova, University of Western Ontario
Zachary Zimmer, Mount St. Vincent University

May 31, 2018, REVES@30
“Pain is a more terrible lord of mankind than even death itself.”
Albert Schweitzer, 1931
Chronic pain fact sheet

• Definition
  • Unpleasant sensory and emotional experience associated with actual or potential tissue damage.
  • Chronic pain: 3+ months

• Burden
  • Affects more than diabetes, HD, cancer combined
  • >$600,000,000,000 annually (US)
  • Most common reason for health care use
  • Most common cause of disability
Pain trends: What do we know?

• Not much
  • Cf. to trends in other health dimensions

• Demography of pain: emerging area

• 2 new studies of older adults in US using HRS (Grol-Prokopczyk 2017, Zimmer & Zajacova 2018)

• HRS question “Are you often troubled with pain?”
2-3% increase in pain per year, US older adults
Questions today

• What are pain trends in US & Canada among middle-aged and older adults?
  • What are key correlates of the trends?
Motivation

• **US & Canada**
  • Highest opioid use (per capita)
  • Similarities in context (↑ inequalities)
  • Differences in context (health care, social welfare, …)

• **Inclusion of younger age groups (45-64)**
  • Harbinger of future patterns
  • Opioid (mis)use
  • Trends in other health dimension different from 65+
US Data: NHIS

- NHIS 2002-2016
- **Sample**: adults 45-64 & 65-84 (N~150,000 each)
- **Time** in month increments

Canada data: CCHS

- CCHS 2001-2014 (public use)
- **Sample**: adults 45-64 & 65-84 (N~250,000 each)
- **Time** is interview wave: every 2 years 2001-2007, annually 2009-2014
How is pain measured?

• NHIS: “During the past 3 months, did you have”
  • Low-back pain
  • Neck pain
  • Headache/migraine
  • Facial/jaw
  • Joint pain

Any of these (yes/no)

• CCHS: “Are you usually free of pain or discomfort?”
  (yes/no, reverse-coded)
Proportion with pain

Age 45-64
56% report pain

Age 45-64
25% report pain
Approach

- **Outcome**: pain
- **Key predictor**: time of interview (trend)
- **Covariates**: usual suspects
- **Regression models of pain as a function of time**
  - Logistic, LPM, OLS, semiparametric (partial-linear)
  - Time specified as dummies, linearly, nonparametric
US raw data: pain over time

Pain Levels 2002-2016, US Adults Age 45-64

Weighted mean pain levels, for each month
US raw data: pain over time

Pain Levels 2002-2016, US Adults Age 45-64

Weighted mean pain levels, for each month
US raw data: pain over time

Pain Levels 2002-2016, US Adults Age 45-64

Weighted mean pain levels, for each month
US raw data: pain over time

Pain Levels 2002-2016, US Adults Age 45-64

Weighted mean pain levels, for each month

Education 2002-2016 over time, US Adults Age 45-64

Weighted mean education levels for each month
US Unadjusted trend

Pain Levels 2002-2016, US Adults Age 45-64

Weighted mean pain levels, for each month
US Unadjusted trend

Pain Trend 2002-2016, US Adults Age 45-64

From semiparametric unadjusted model of pain.
US Age-adjusted trend

Pain Trend 2002-2016, US Adults Age 45-64

From semiparametric age-adjusted model of pain.
• **20% higher odds of pain in 2016 vs. 2002**

From semiparametric unadjusted model of pain.
Canada Age-adjusted trend
Age-adjusted trend

- **40% higher odds of pain in 2014 vs. 2001**

From age-adjusted logistic models of pain
Pain trend for major pop groups

Pain Trend 2001-2014, Canada, Adults 45-64

Year

Probability

Pain trend for major pop groups

Pain Trend 2002-2016 by Race, Men Only

From semiparametric age-adjusted model of pain.
Pain trend for major pop groups

Pain Trend 2002-2016 by Race, Men Only

- White Men
- Black Men

From semiparametric age-adjusted model of pain.
Pain trend for major pop groups

Pain Trend 2002-2016 by Race, Men Only

From semiparametric age-adjusted model of pain.
Pain trend for major pop groups

Pain Trend 2002-2016 by Race, Women Only

From semiparametric age-adjusted model of pain.
Pain trend for major pop groups

Pain Trend 2002-2016 by Education, US Adults Age 45-64

From semiparametric age-adjusted model of pain.
Key correlates of the trend?

- **Demographics**: sex, race, foreign-born, language of interview, proxy
- **Social ties**: marital status, household size, number of children at home
- **Education**
- **Economic/employment**: employment status, worked prior year, occupation, family income, home ownership
- **Health behaviors**: smoking, alcohol use, BMI
- **Chronic conditions**: 13 physical-health conditions, K6 depressive symptoms index.
Key correlates of the trend?

• Countervailing influences of many factors
Key correlates of the trend?

• Pain *increase* most strongly correlated with
  • ↓ Economic wellbeing & employment
  • ↑ BMI & changing pattern of alcohol use
  • ↑ Psychological distress, diabetes, hypertension

• Pain growth *suppressed* as a function of
  • ↑ Education
  • ↓ Smoking
  • Changes in prevalence of arthritis, heart, respiratory
Key correlates of the trend?

• Pain increase most strongly correlated with
  • ↓ Economic wellbeing & employment
  • ↑ BMI & changing pattern of alcohol use
  • ↑ Psychological distress, diabetes, hypertension

• Pain growth suppressed as a function of
  • ↑ Education
  • ↓ Smoking
  • Changes in prevalence of arthritis, heart, respiratory
Take-home message

• US & Canada adults report increasingly more pain
• Increase evident in most population groups
  • Points to systemic changes in both countries
• Economic circumstances and ‘despair’-related behaviors may play a role
  • Points to complex social component of pain
Bigger picture

- Population-health research should include pain
- Need care asking about pain
- How to address reporting?
  - Link to conditions and limitations
The rising pain prevalence among US and Canadian Adults

Anna Zajacova, University of Western Ontario
Zachary Zimmer, Mount St. Vincent University

May 31, 2018, REVES@30
From age-adjusted models of pain on interview year, stratified. Men and solid; women are dashed.
Pain Trend 2001-2014, Canada, Adults 45-64

Year:
- 2001
- 2004
- 2008
- 2011
- 2014

Probability:
- 0.20
- 0.25
- 0.30

Canada
Canada

Pain Trend 2001-2014, Canada, Adults 45-64

Year

Probability


0.20 0.25 0.30
Pain Trend 2001-2014, Canada, Adults 45-64