The rising pain prevalence among US and Canadian Adults

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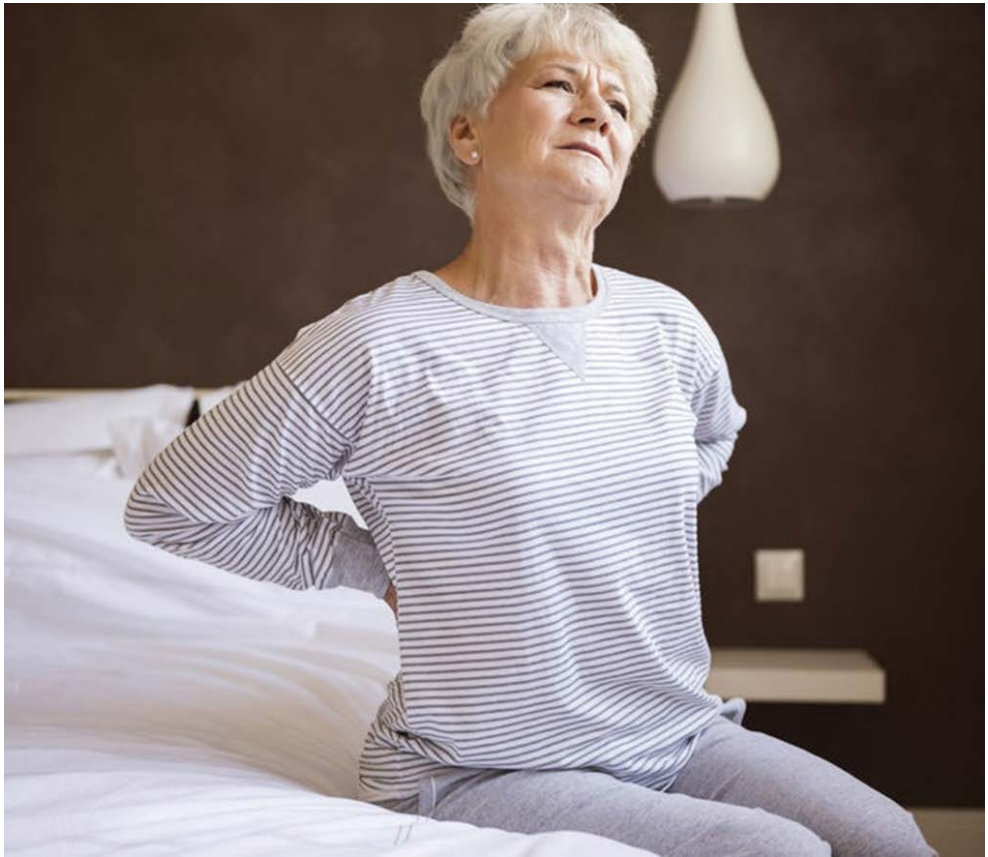
“Pain is a more terrible lord of mankind than even death itself.”

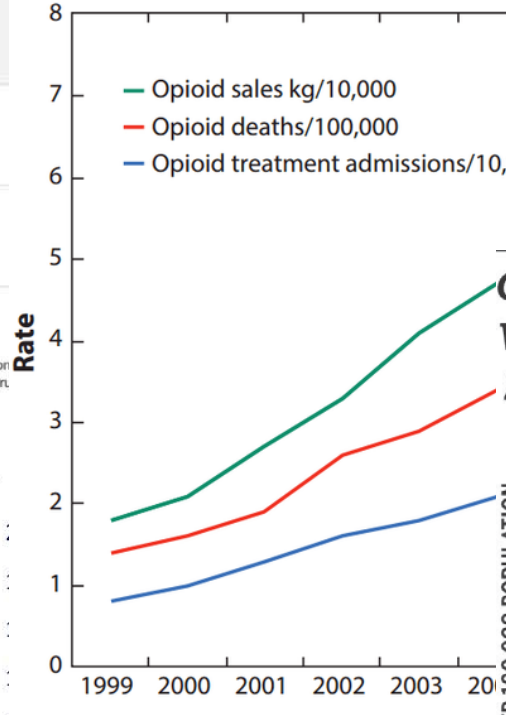
Albert Schweitzer, 1931

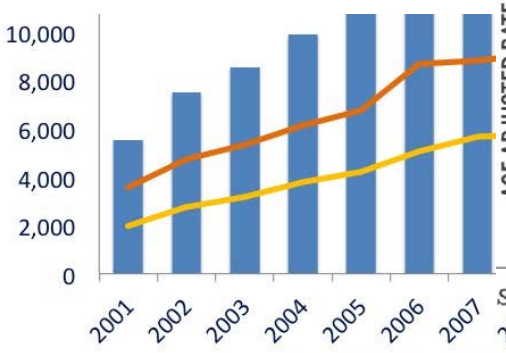


Chronic pain fact sheet

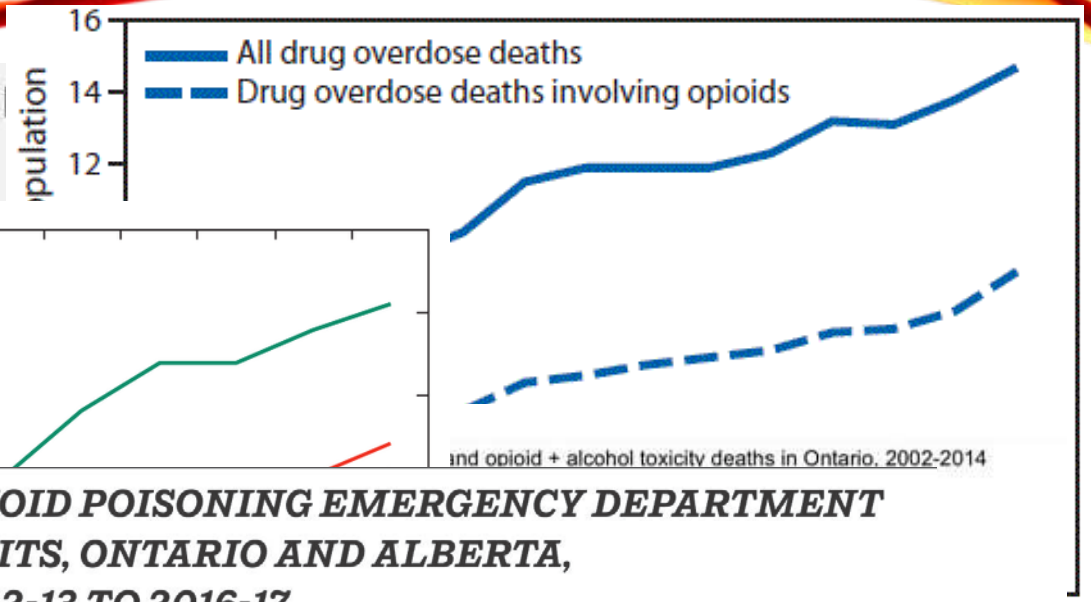
- Definition
  - Unpleasant **sensory and emotional experience** associated with actual or potential tissue damage.
  - Chronic pain: 3+ months
- Burden
  - Affects more than diabetes, HD, cancer combined
  - >$600,000,000,000 annually (US)
  - Most common reason for health care use
  - Most common cause of disability

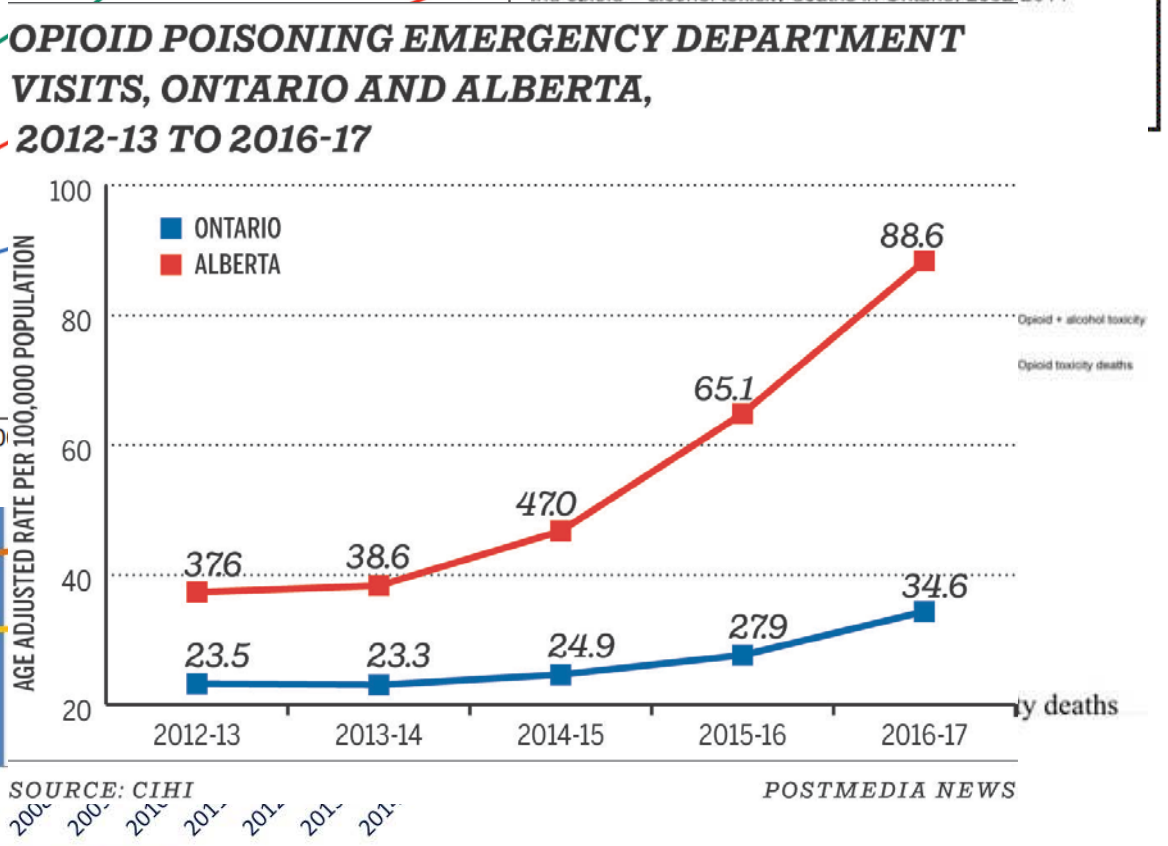
Figure 4. Opioid Prescriptions Dispensed





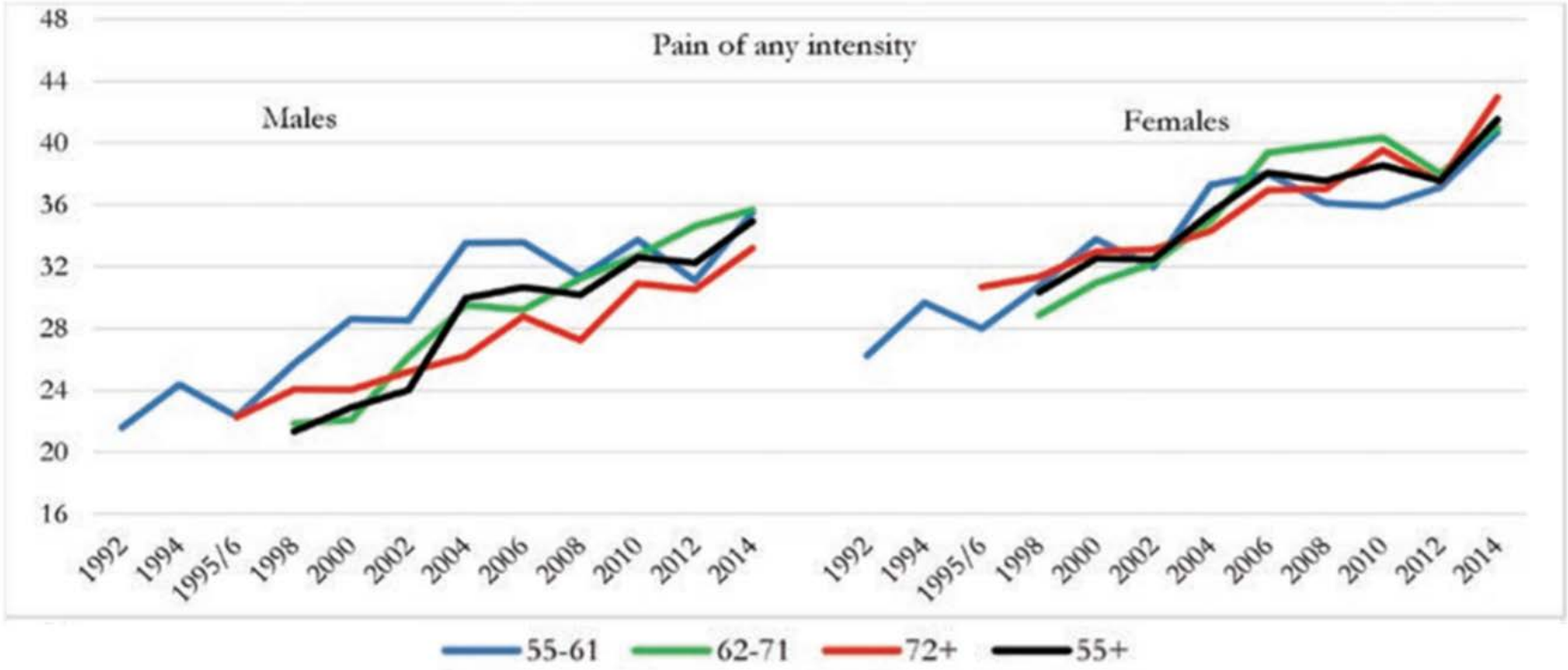
Source: National Center for Health Statistics, CDC Wonder





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

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Original Article

Persistent, Consistent, and Extensive: The Trend of Increasing Pain Prevalence in Older Americans

Zachary Zimmer, PhD,[1] and Anna Zajacova, PhD[2]

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

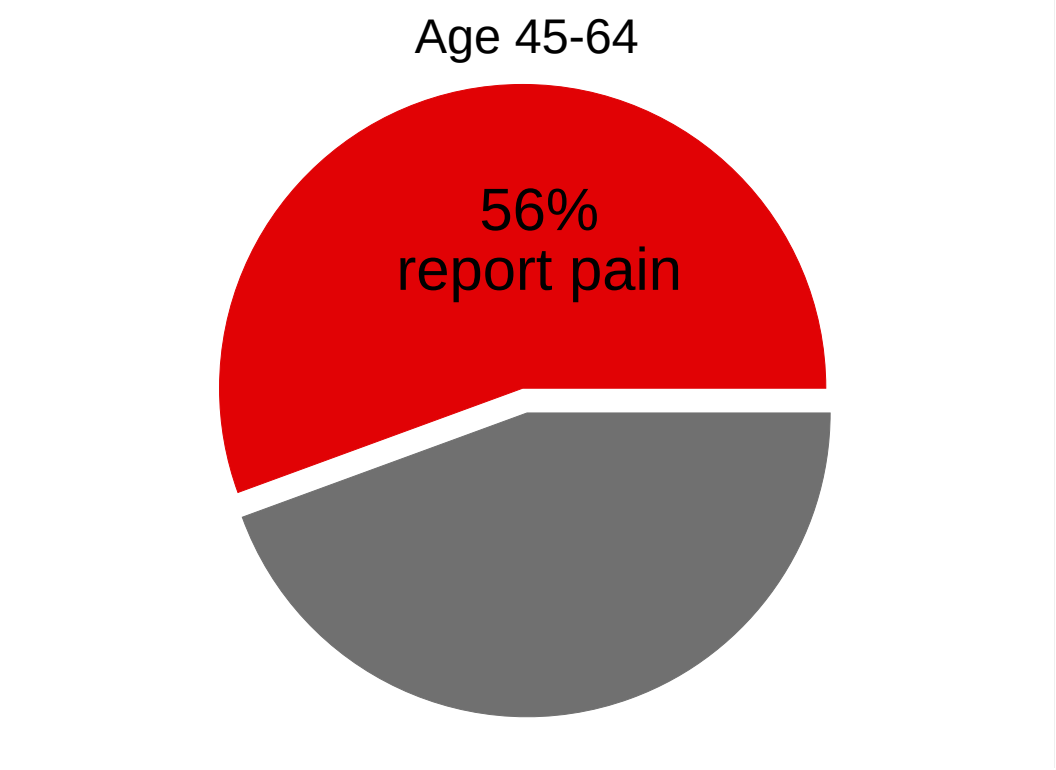
How is pain measured?

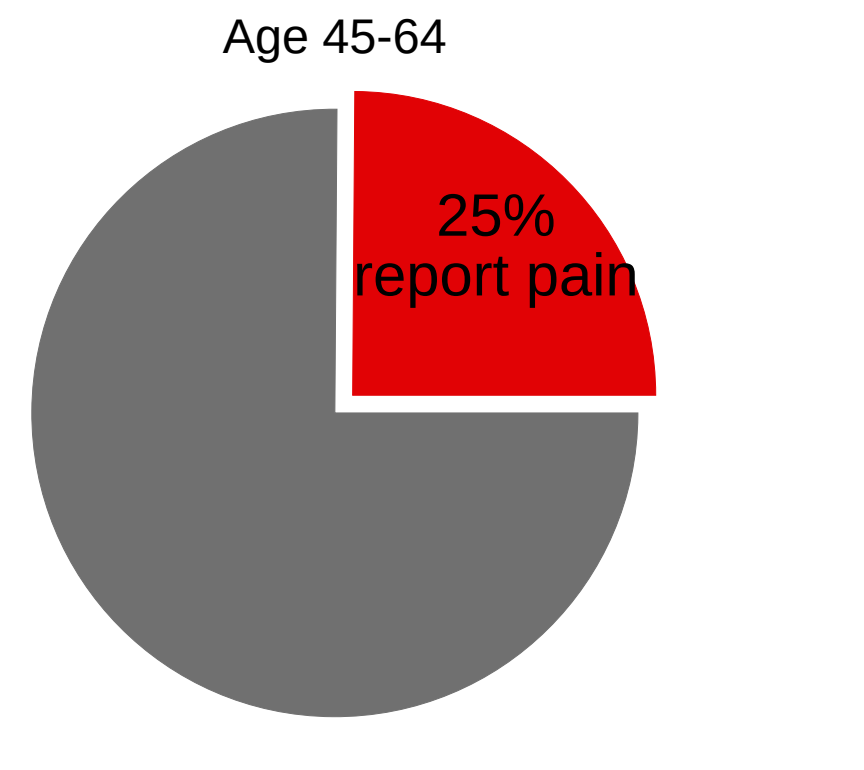
- NHIS: “During the past 3 months, did you have”
  - Low-back pain
  - Neck pain
  - Headache/migraine
  - Facial/jaw
  - Joint pain

  Any of these (yes/no)
- CCHS: “Are you usually **free of** pain or discomfort?”

  (yes/no, reverse-coded)

Proportion with pain



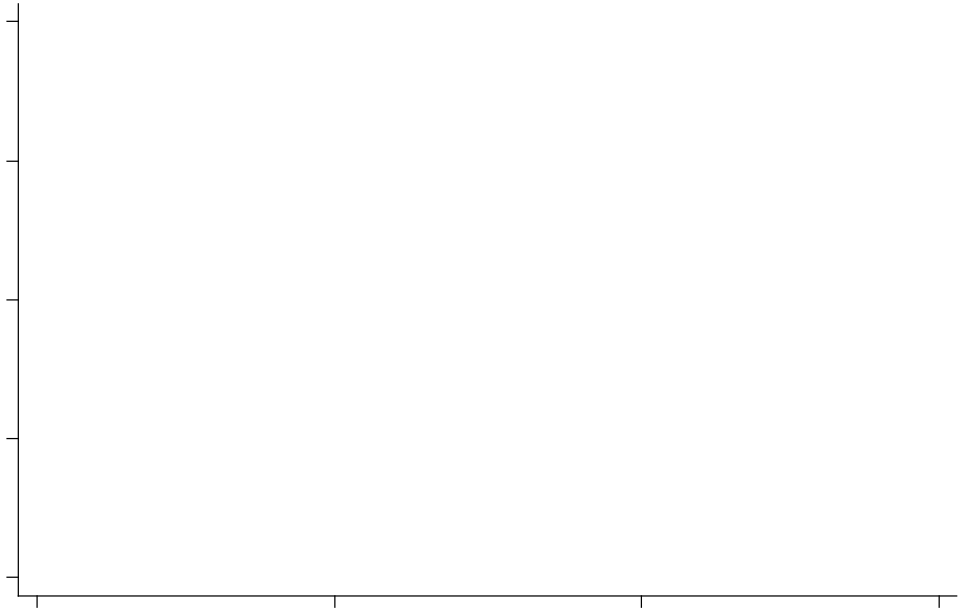


Approach

- 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

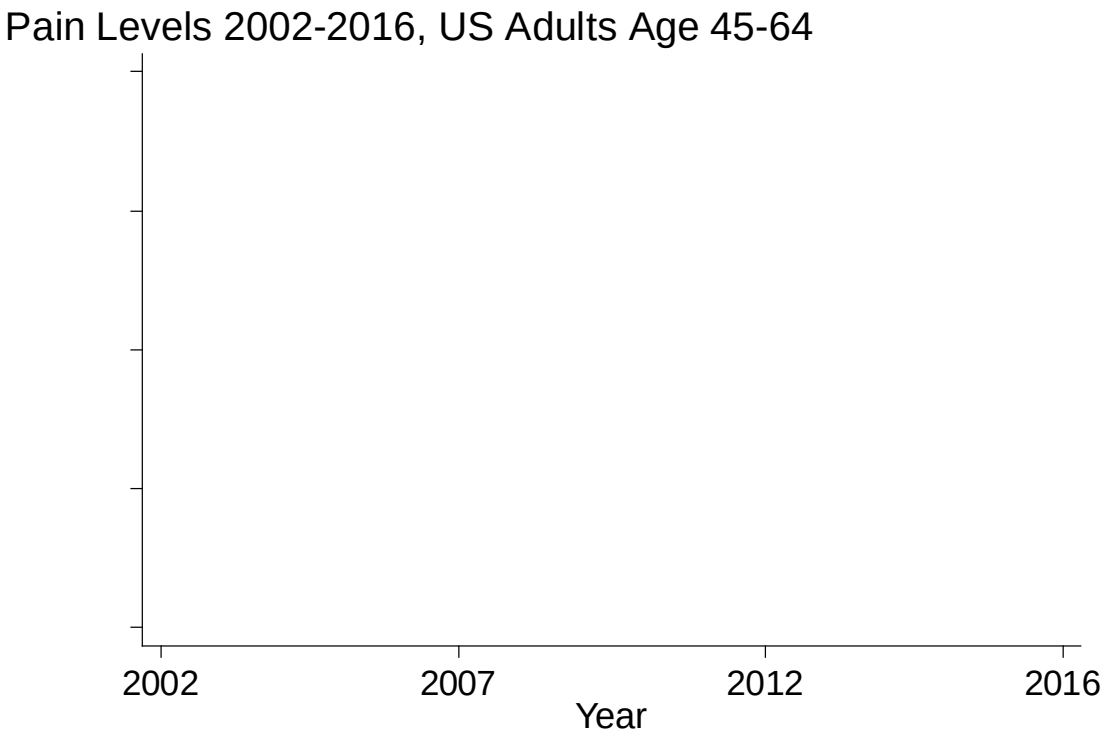
US raw data: pain over time

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



Weighted mean pain levels, for each month

US raw data: pain over time



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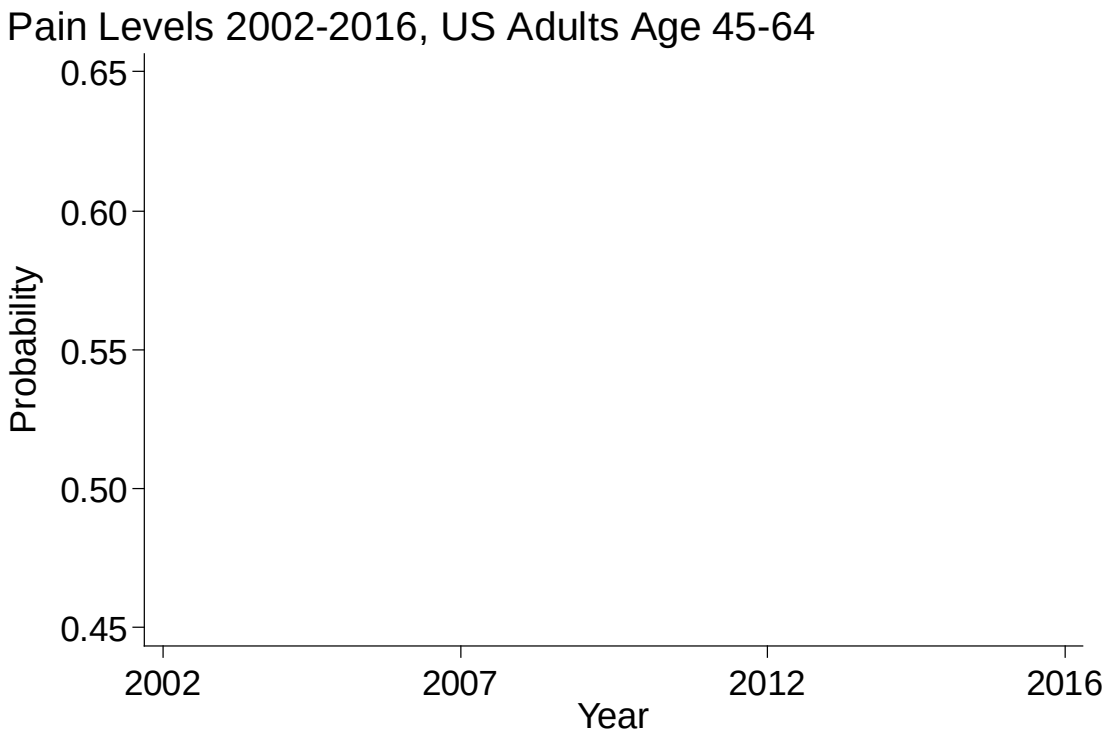

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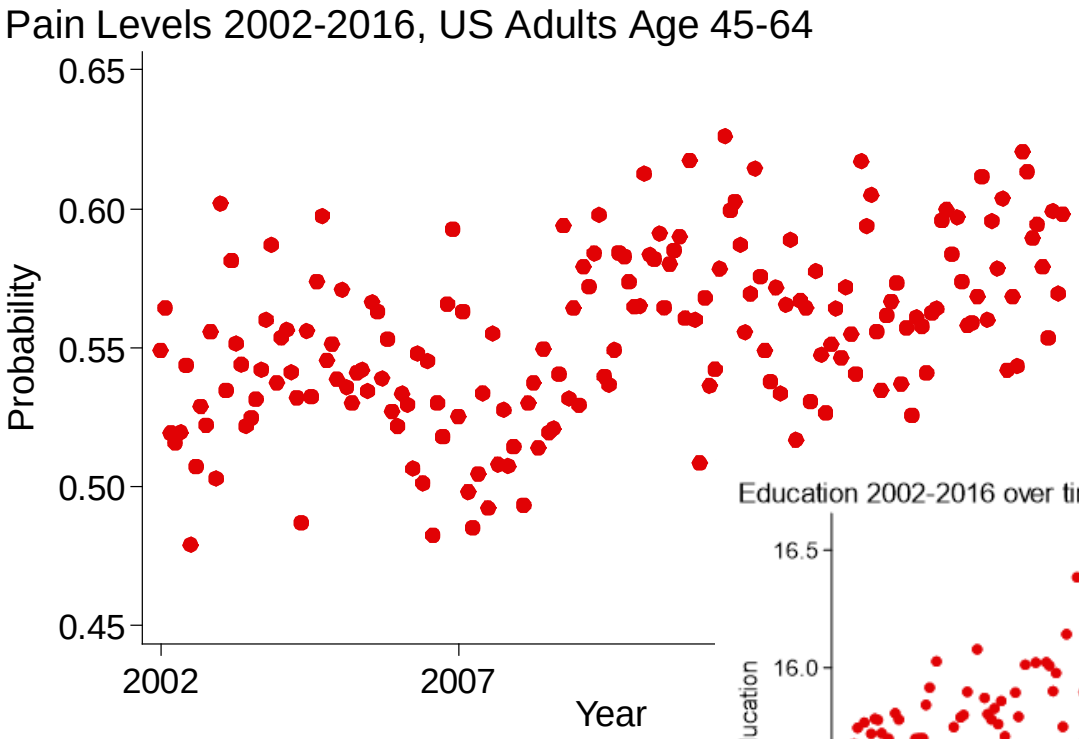

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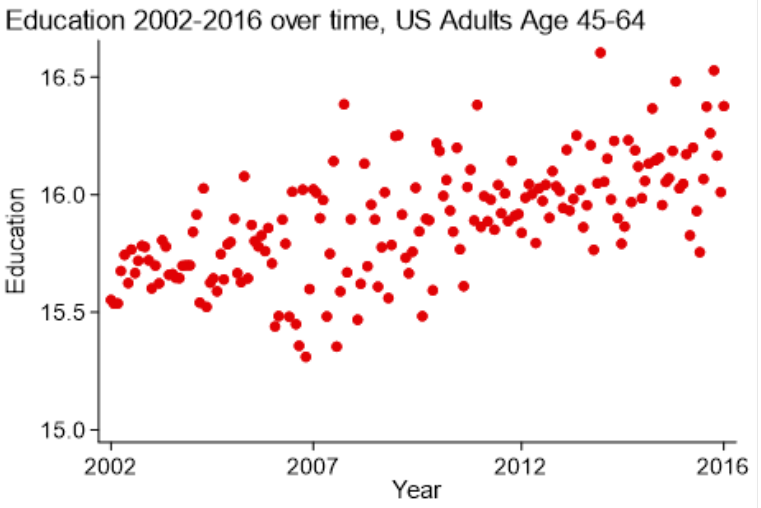
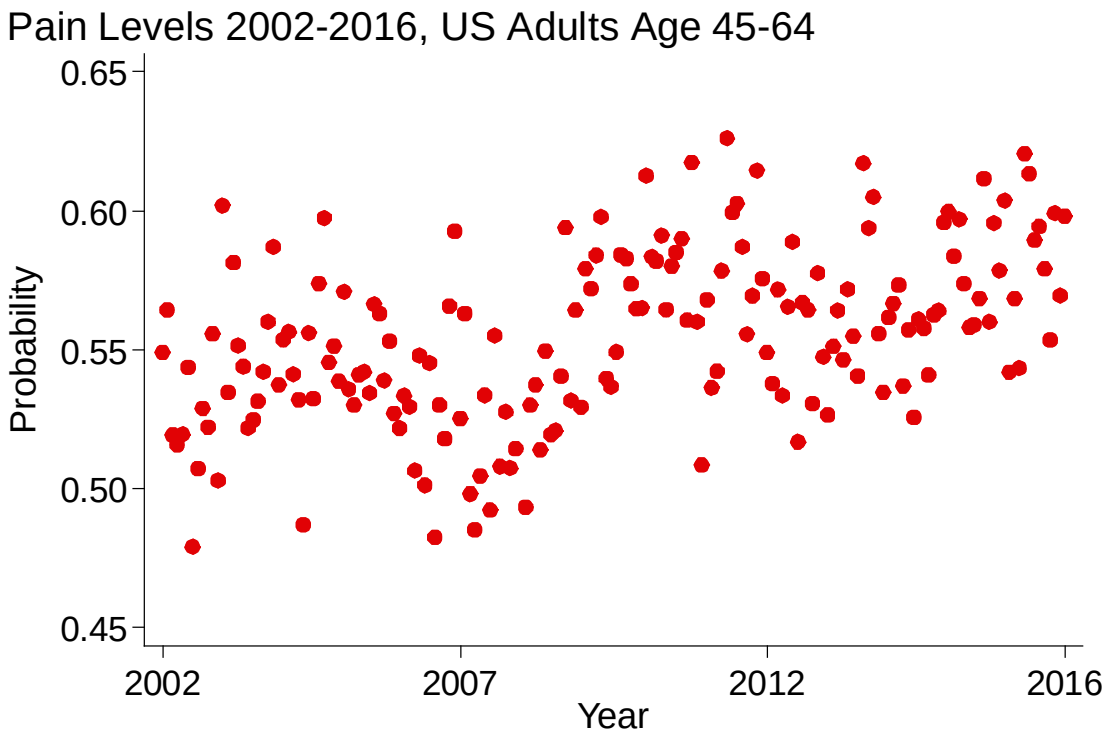


Weighted mean education levels, for each month

US Unadjusted trend



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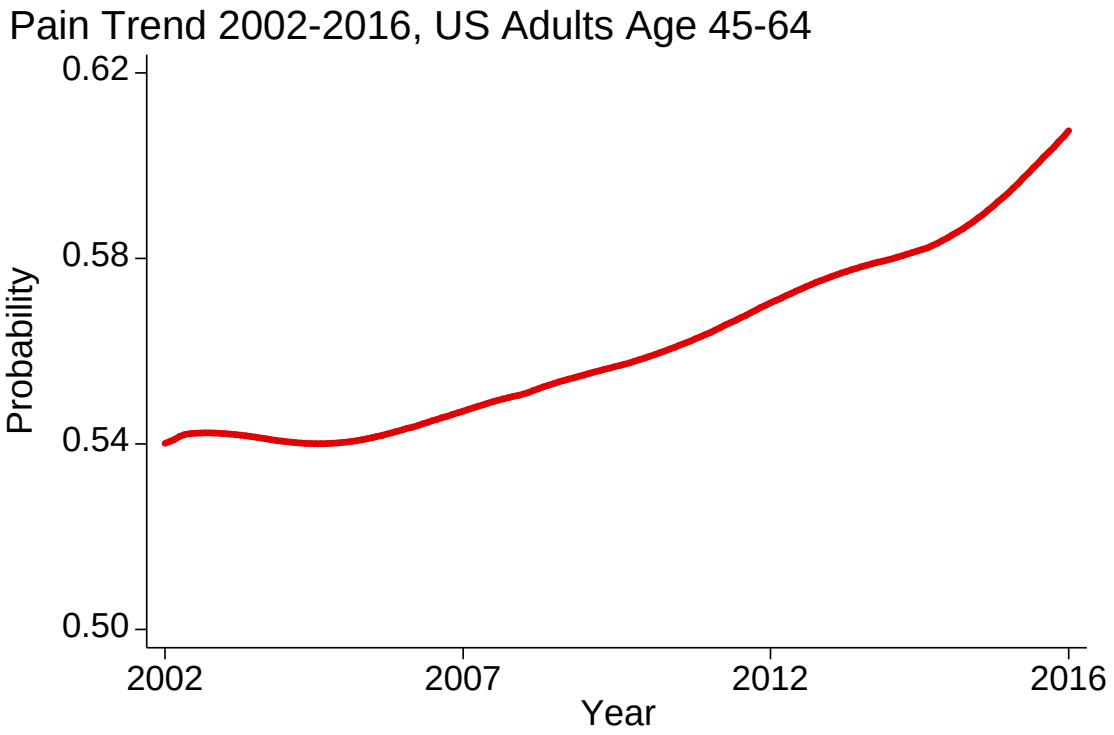
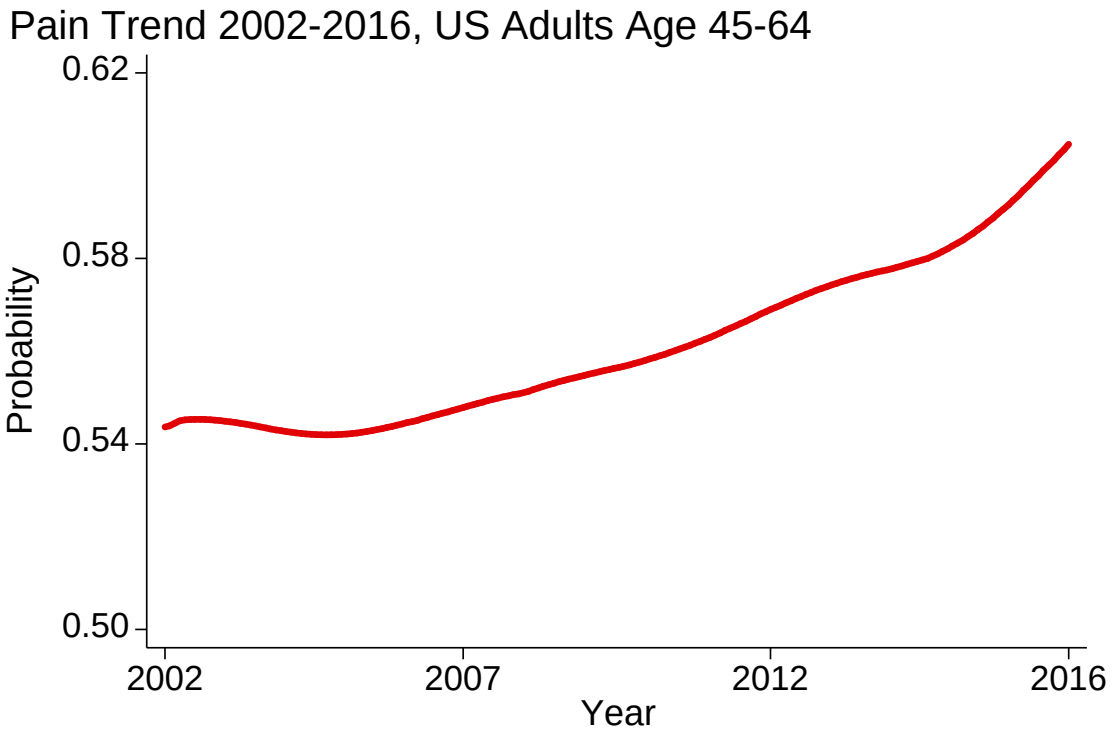


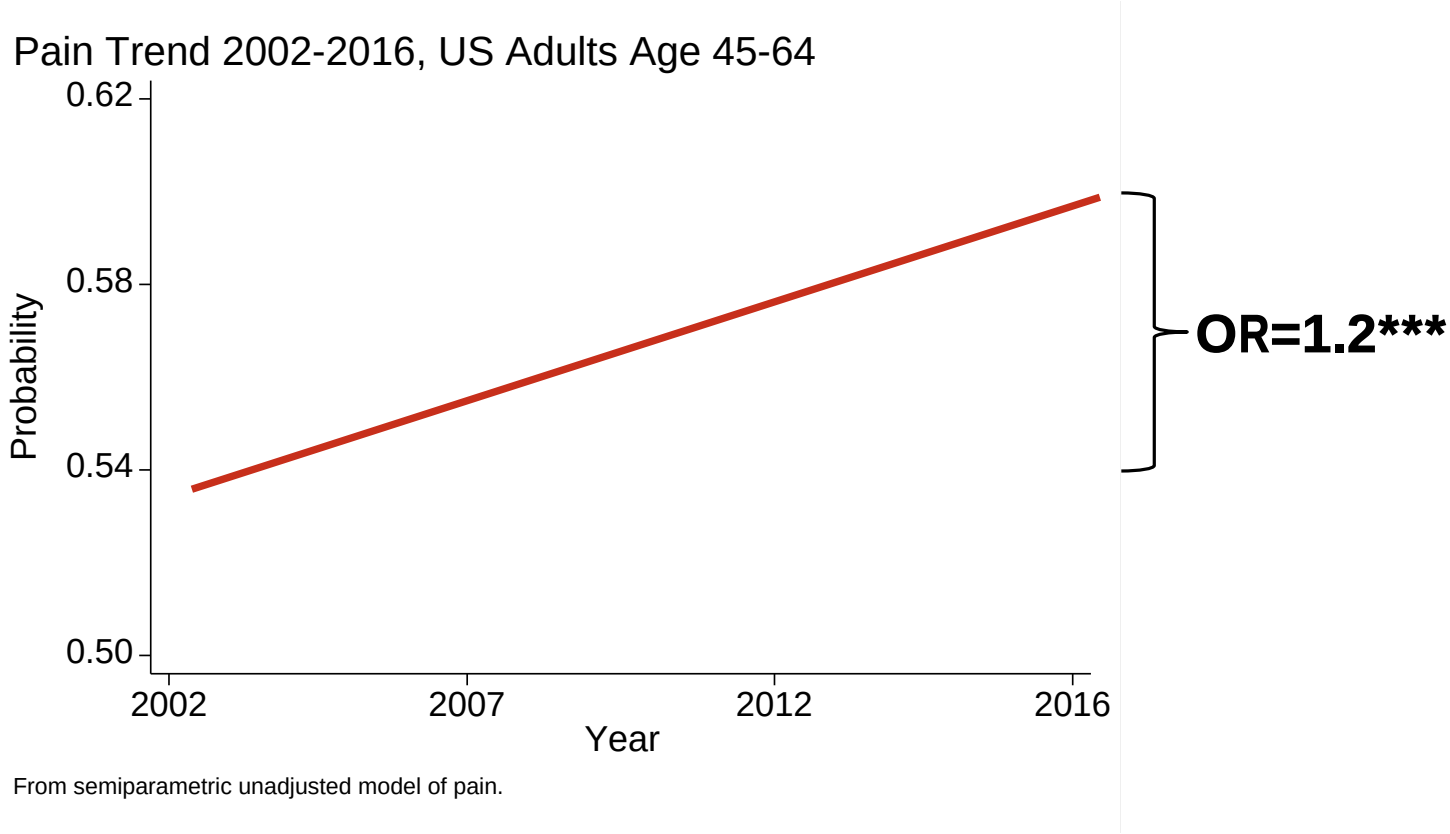
From semiparametric unadjusted model of pain.

US Age-adjusted trend



From semiparametric age-adjusted model of pain.

US Linear trend

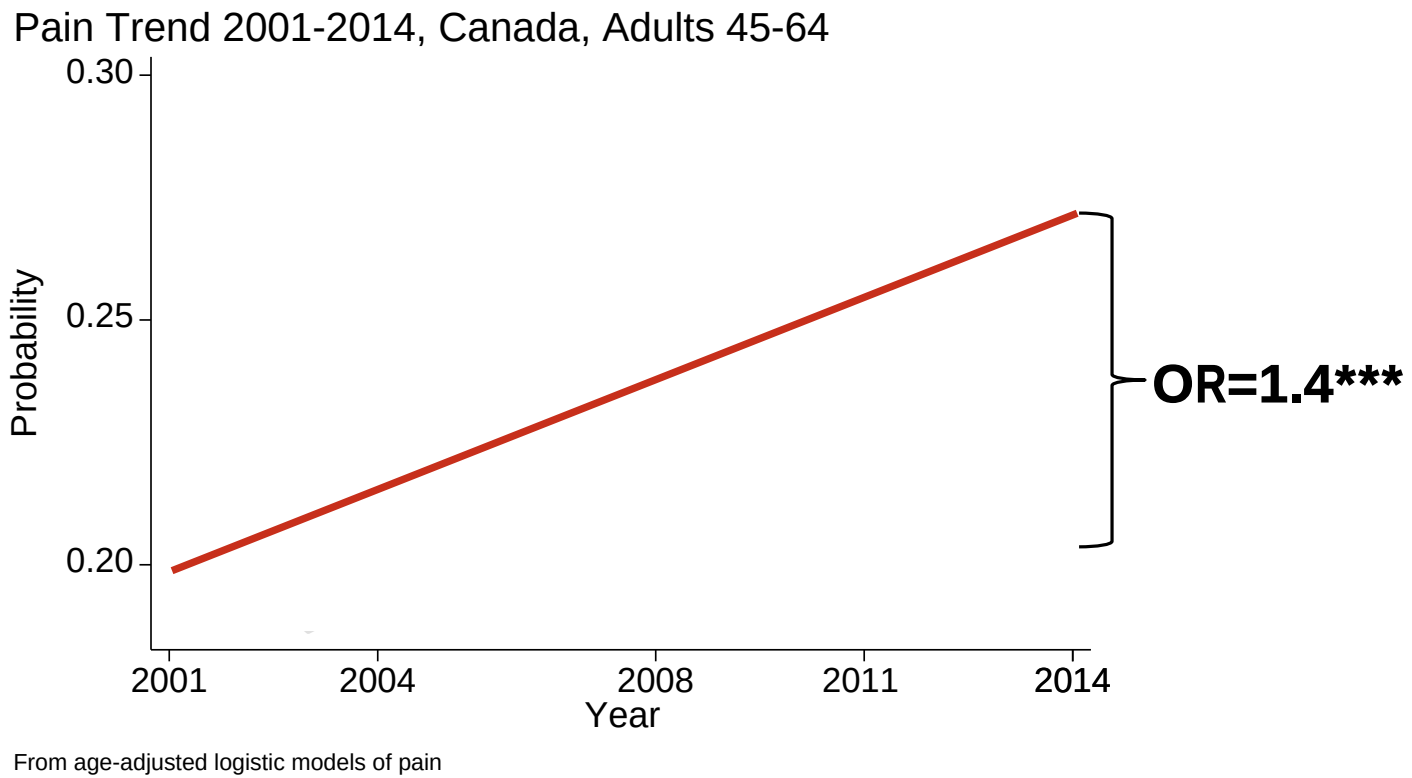


From semiparametric unadjusted model of pain.

- **20% higher odds of pain in 2016 vs. 2002**

Canada Age-adjusted trend

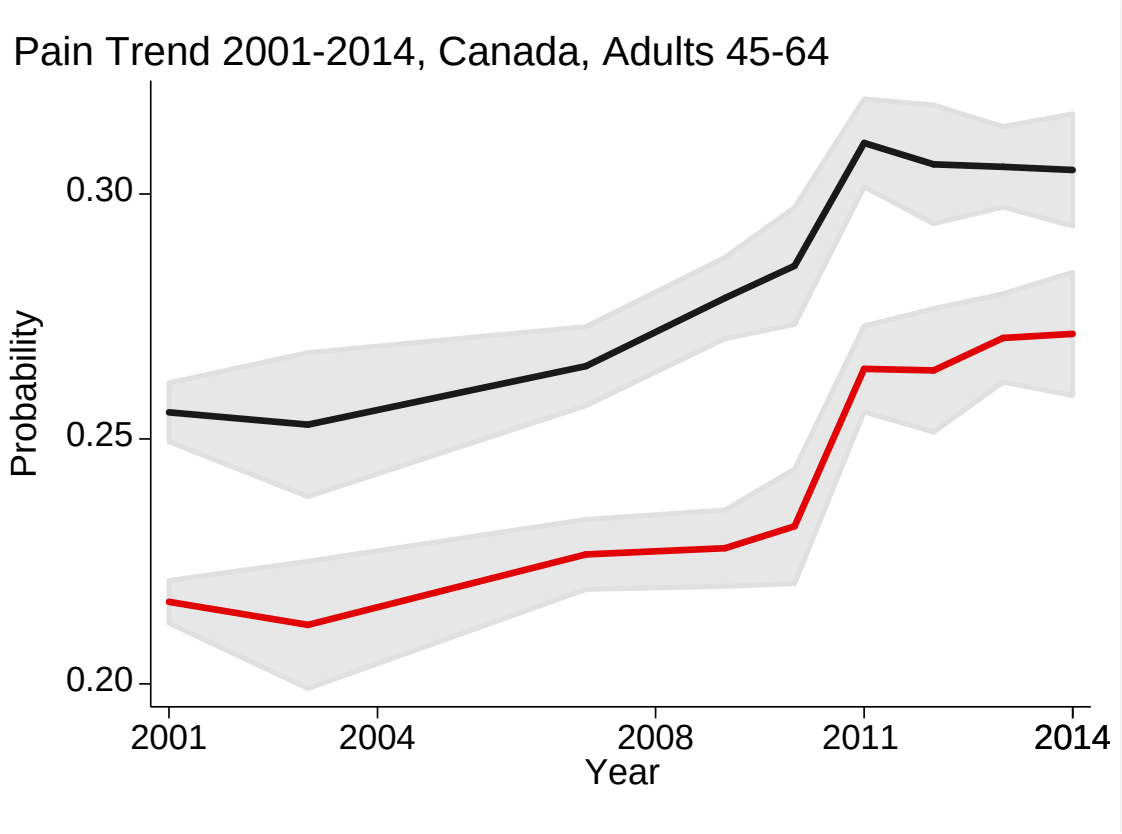
Age-adjusted trend



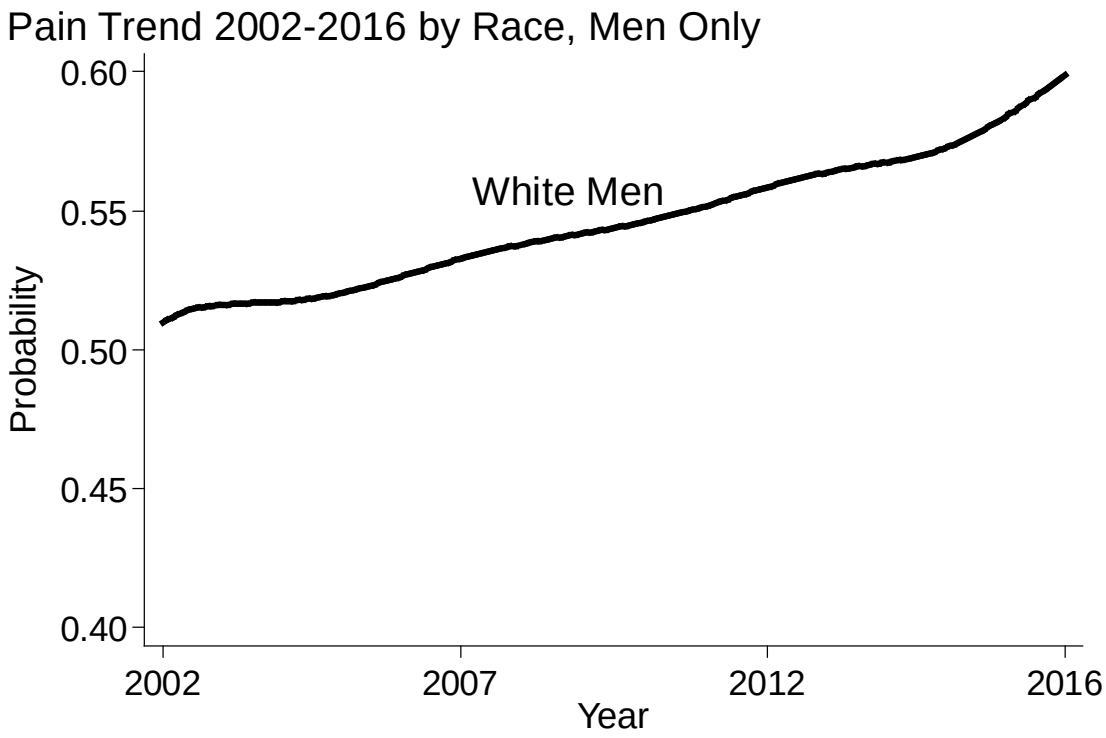
From age-adjusted logistic models of pain

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

Pain trend for major pop groups

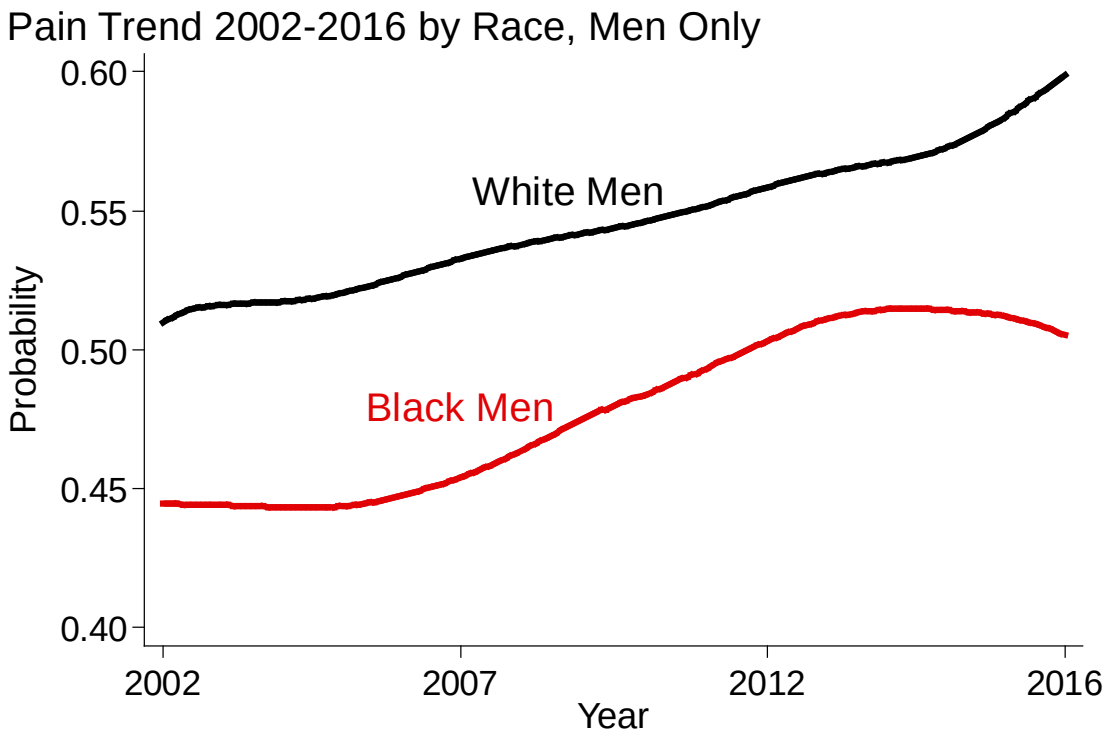


Pain trend for major pop groups



From semiparametric age-adjusted model of pain.

Pain trend for major pop groups



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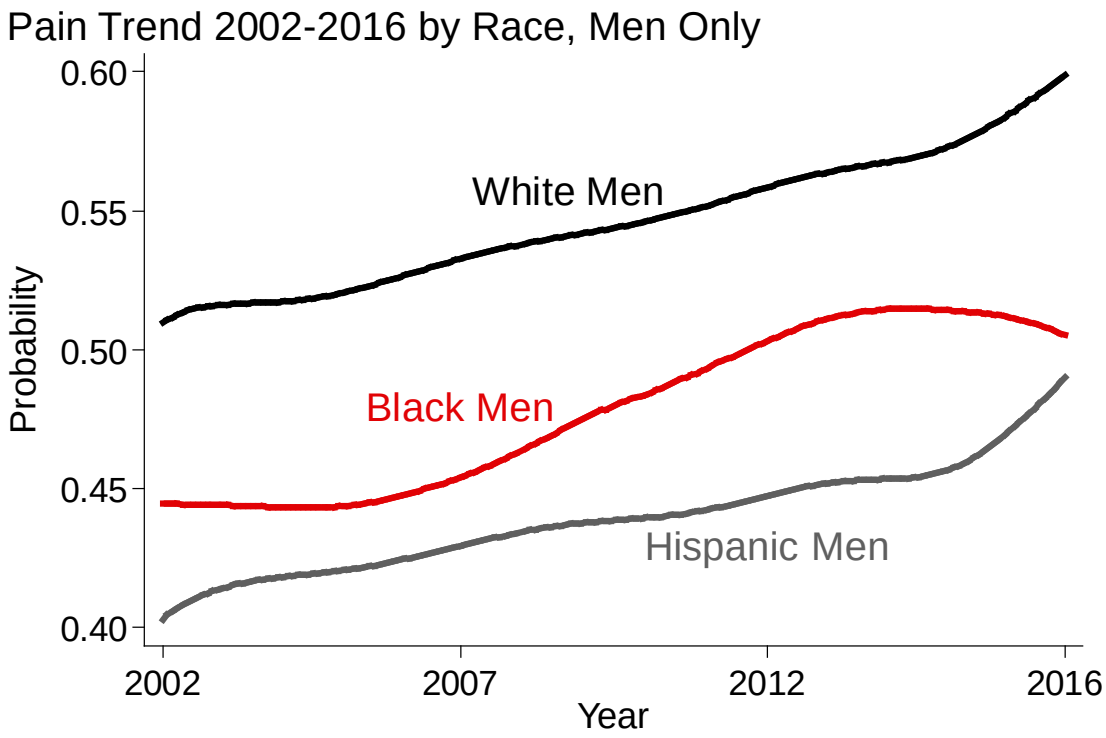

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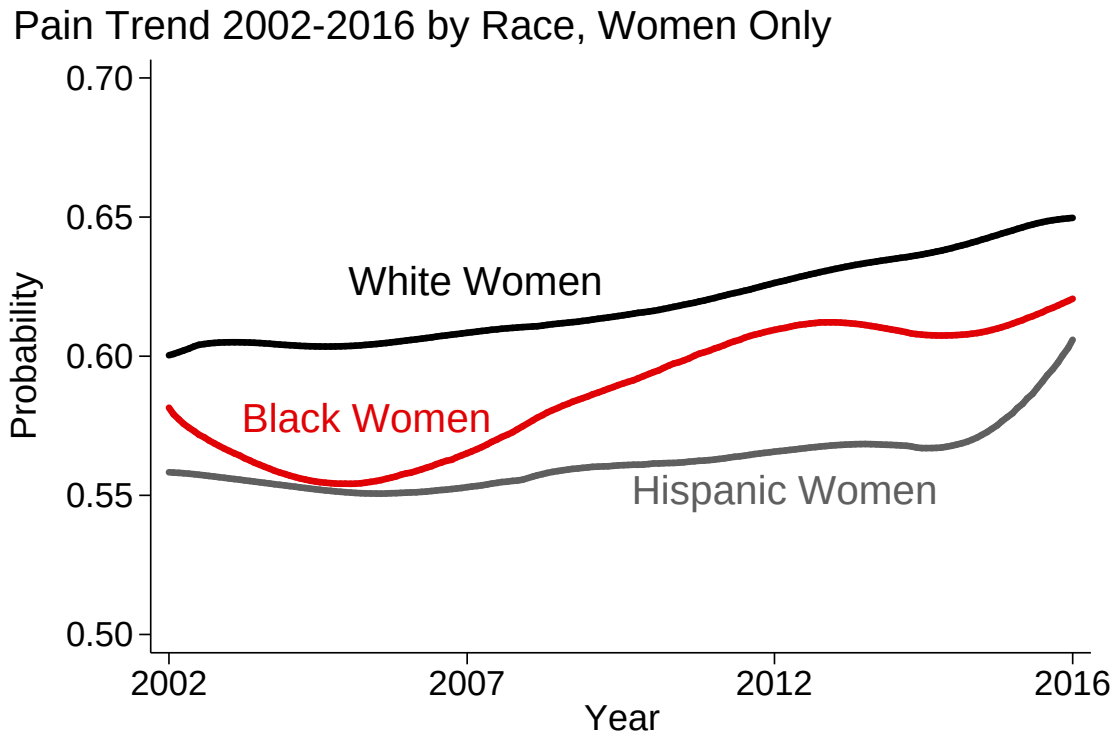

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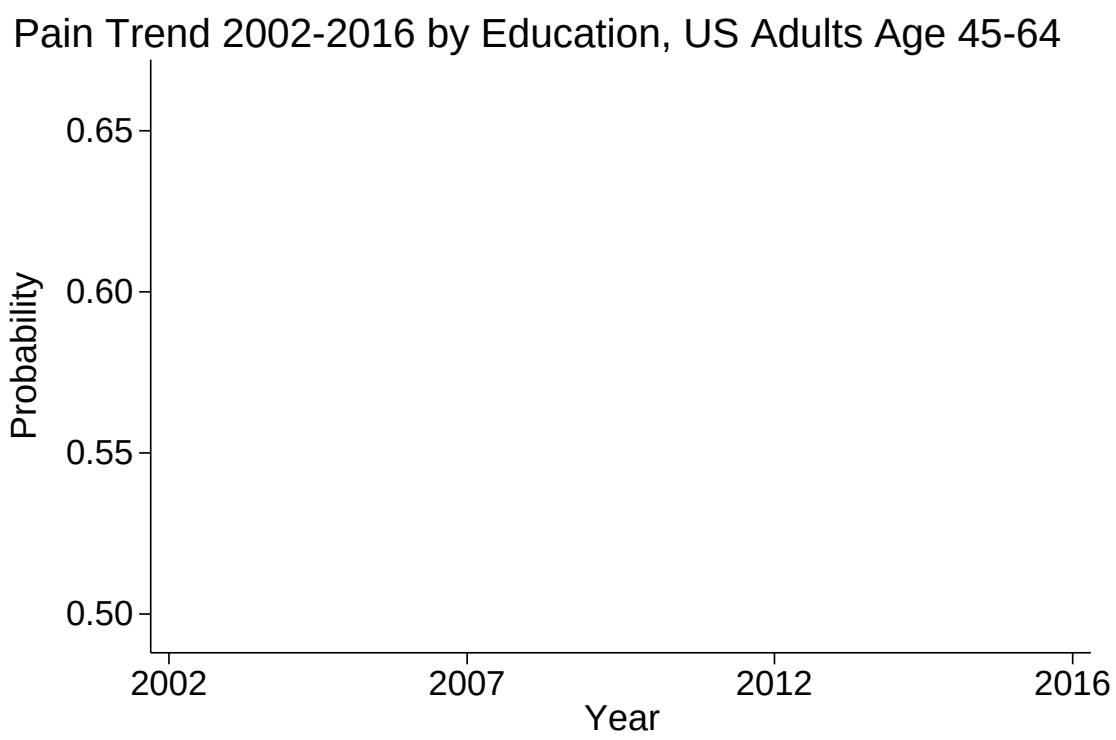

From semiparametric age-adjusted model of pain.

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

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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

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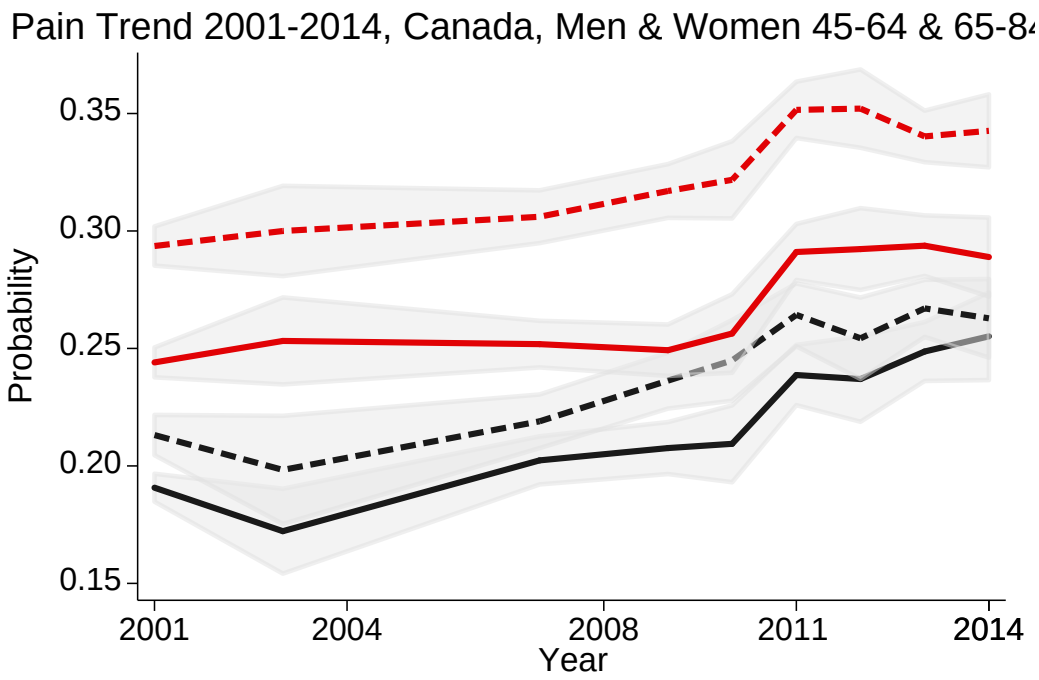
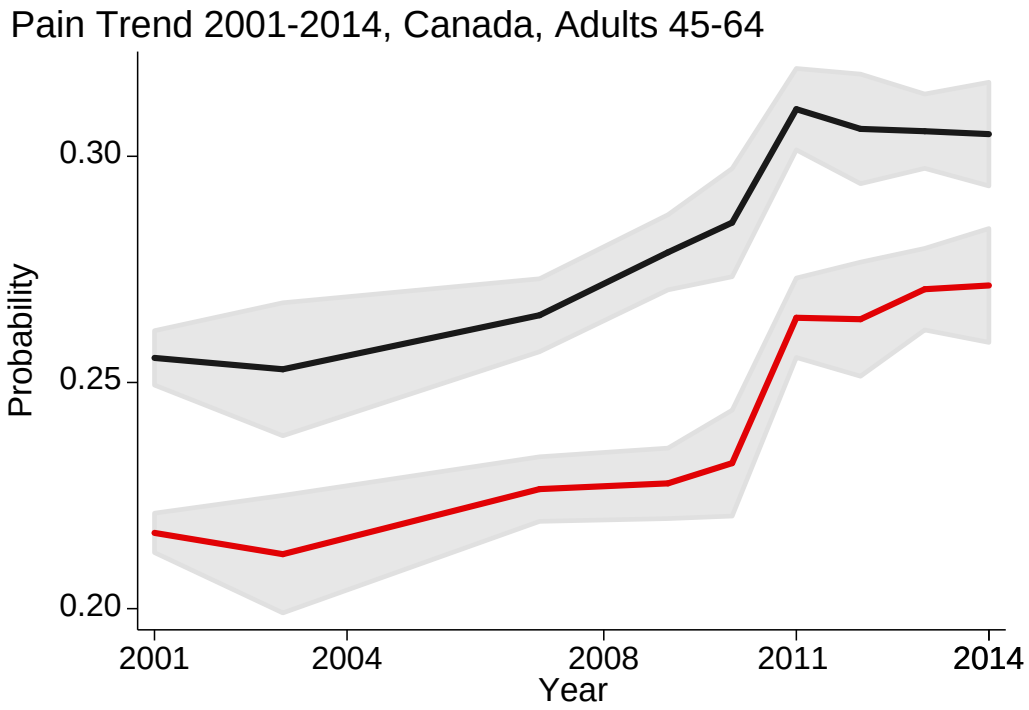
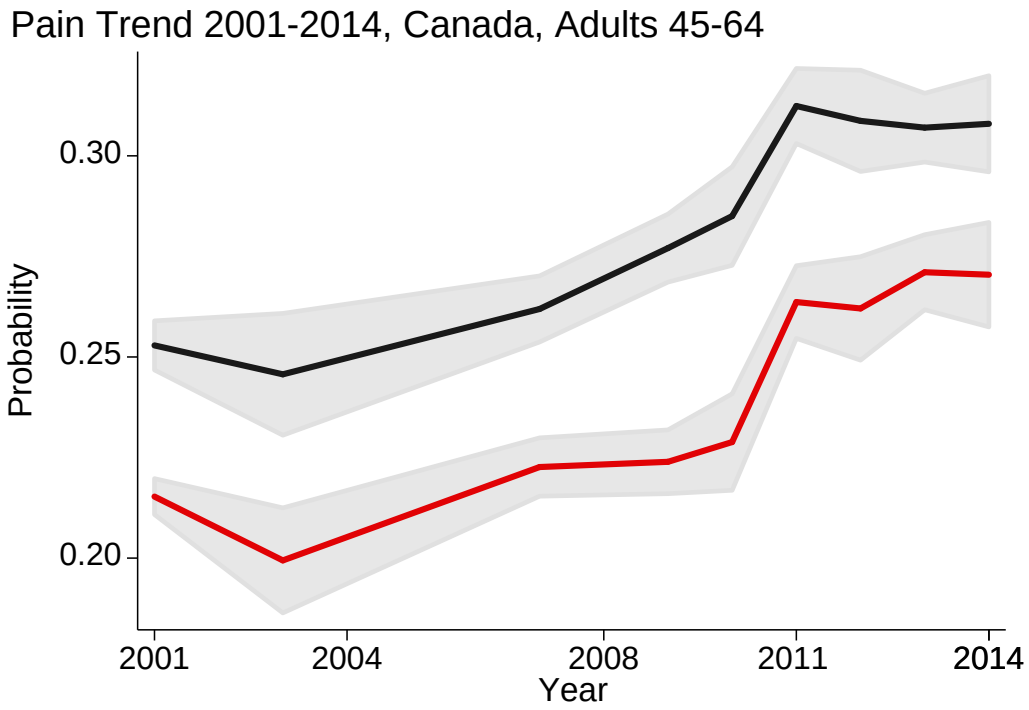


From age-adjusted models of pain on interview year, stratified. Men and solid; women are dashed.

Canada


Pain Trend 2001-2014, Canada, Adults 45-64
Probability
0.30
0.25
0.20
2001
2004
2008
2011
2014
Year

Canada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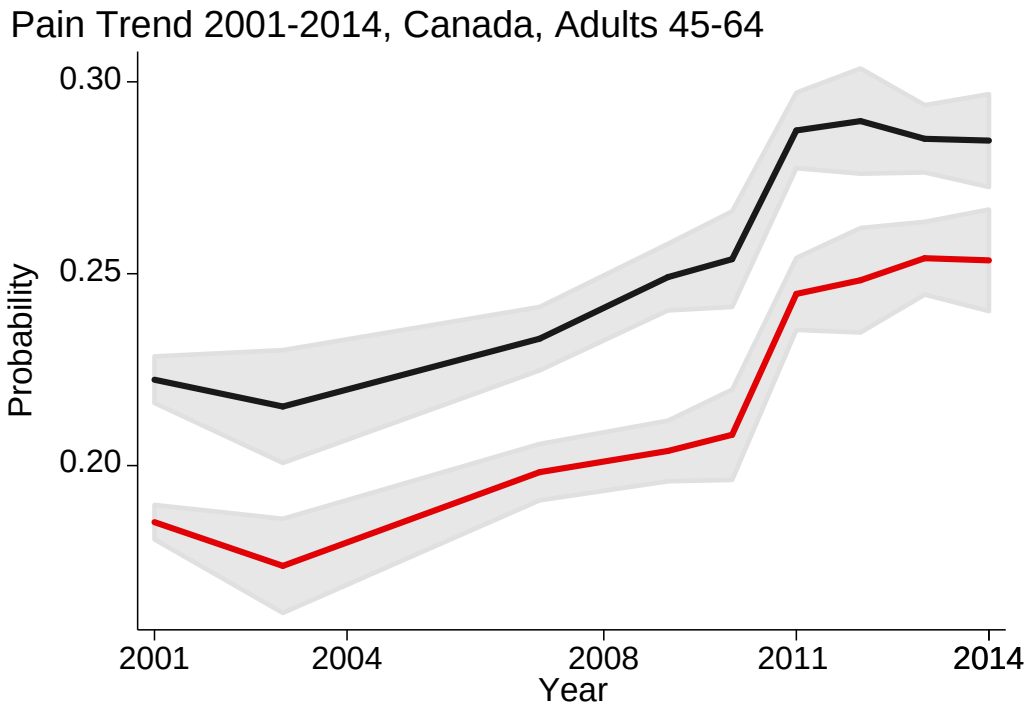
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