

Minimum Wages and Health in Canada

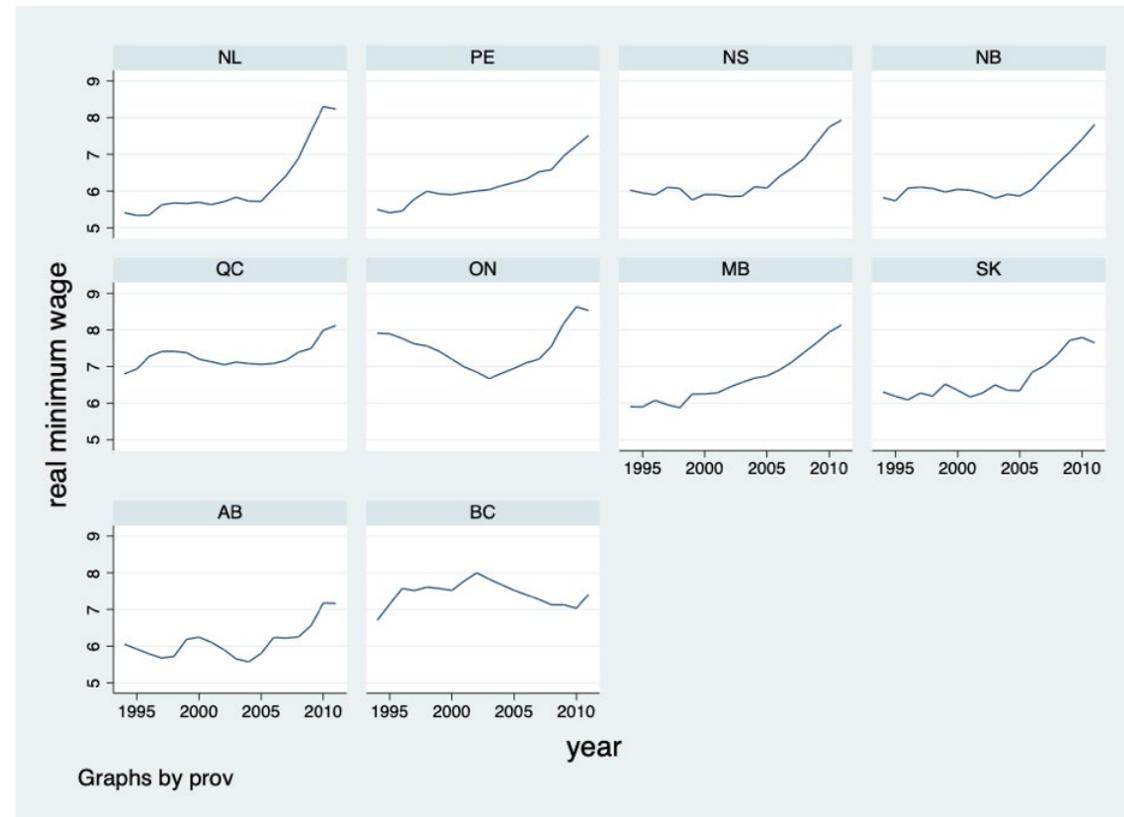
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Introduction

- The nominal minimum wages in Canada (provincial changes) increased by 100% from around \$5 to about \$10 from 1994 to 2011. Average real values increased by approximately 26%:



Introduction cont.

- Changing minimum wages is a controversial policy.
- Higher minimum wages could increase the well-being of low-skilled workers through higher earnings and reduced income inequality. (Fortin et al. 2012)
- Higher minimum wages increase the cost to firms and raise the prices, and may raise unemployment, mostly for younger workers in Canada (Gunderson, 2005).
- Many economics studies focus on the effects of minimum wages on labour market outcomes and poverty (e.g., Card and Krueger 1995, Neumark et al., 2004).
- Some studies have examined the potential effects on health outcomes of low-skilled workers (more likely group).
- Neumark (2023) surveys much of this evidence; our study has a similar goal but instead uses relatively comprehensive longitudinal sets (Canadian NPHS; LISA) to examine many health outcomes and behaviours.

- We find in Canadian panel data:
- Real minimum wage increases associated with:
 - For women:
 - poorer general health
 - little evidence of mental health change
 - For men:
 - better mental health
 - little evidence of general health changes
- Screening approach (studying many variables):
 - For women:
 - finds some increases in less healthy behaviours which could possibly explain poorer health
 - but also some changes that might improve health
 - For men:
 - increases in healthier behaviours; puzzling why these and increases in mental health are not associated with improvement in general health
- Overall: a mixed picture, consistent with the survey of Neumark (2023)

Five Pathways

- The minimum wage will increase the incomes of some workers. Healthcare is a normal good (Rexford and Stephen 2004) . On the other side, higher income could also increase the consumption of less healthy products, such as alcohol.
- A higher income would reduce financial stress for workers and increase their job satisfaction.
- The opportunity cost of being off sick (substitution effect).
- Minimum wage hikes increase demand for health services as the usage goes up for some, possibly with the consequence of straining the system so that there is a more unmet need for others.
- Reactions by firms. Firms may cut hours or lay off their workers in response to higher minimum wages.

Examples from the Literature

- McCarrier et al. (2011) find that higher state-level minimum wage rates are significantly negatively associated with the odds of reporting unmet medical needs.
- Hoke & Cotti (2015) find a positive relationship between minimum wage increases and binge drinking among teenagers.
- Minimum wage hikes lead to worsening general health among both male and female low-skilled workers in the US (Horn et al., 2017).
- The introduction of the National Minimum Wage (NMW) in the United Kingdom in 1999 significantly reduced smoking by 2.51 percentage points (Lenhart, 2017).

Examples from the Literature cont.

- Kahn et al. (2018) find robust evidence that state-level minimum wage increases reduce medical access in the US.
- Andreyeva & Ukert (2018) show that higher minimum wages increase the probability of being obese and decrease daily fruit and vegetable intake.
- Lenhart (2019) finds that higher minimum wages increase health insurance coverage.
- Higher minimum wages have a limited impact on health behaviours (smoking, drinking, and regular exercise) among low-skilled workers, but minimum wage hikes significantly improve their living standards and job satisfaction in China (Chen 2021).

Data

- Canadian panel data for 1994-2011 National Population Health Survey (NPHS) (cycle 1-cycle 9).
- True panel allows individual fixed effects.
- Sample: Age from 18-64, in the labour force, and report wage as the main source of income, not students.
- Outcomes: Health outcomes and health behaviours (relatively complete set).
- The key independent variable is the provincial level of minimum wages.
- Time-relevant controls:
- Individual-level covariates include age, age square ($\text{age}^2/100$), education level, marital status, household sizes (HHS), and area of residence.
- Provincial-level covariates include Real GDP per capita and unemployment rates.

Methods

- DD: $Y_{ist} = \beta_1 MW_{st} + \beta_2 X_{ist} + \beta_3 P_{st} + \gamma_t + \phi_i + \varepsilon_{ist}$
- DDD: $Y_{ist} = \delta_1 MW_{st} + \delta_2 X_{ist} + \delta_3 P_{st} + v_t + \theta_1 A_i MW_{st} + \theta_2 A_i X_{ist} + \theta_3 A_i P_{st} + A_i v_t + \omega_i + \mu_{ist}$
- Low educated sample in the DD, Low vs high education as additional treatment in the DDD
- Key assumption: underlying trends of health incomes are the same in all provinces so that changes associated with provincial minimum wage changes can plausibly be interpreted as due to those minimum wage changes.
- Weights provided by the NPHS to generate nationally representative estimates.
- Cluster–robust standard errors.

Outcome Results

- Measures of overall general health: e.g. self-reported low health, Health Utility Index
- Health inputs e.g. Body Mass Index (BMI), obesity, fruit and vegetable consumption, exercise
- Risky behaviors: heavy drinking, daily smoking
- Measures of health care need: e.g. unmet healthcare need

Key findings

- Focusing on the cases where DD and DDD results are consistent with some statistical significance:
- Minimum wages increases associated with
 - poorer self-reported health for females (also more chronic conditions and lower Health Utilities Index) but in contrast fewer worker absences, better cognition)
 - possible determinants higher BMI (but not obesity), heavier drinking but in contrast less unmet need, more insurance, less physical inactivity
 - so possible channels for poorer women's health but unclear
 - better self-reported mental health for men perhaps associated with lower drinking and smoking, less household food insecurity, but no associated general health improvement with higher unmet need

Method Discussion

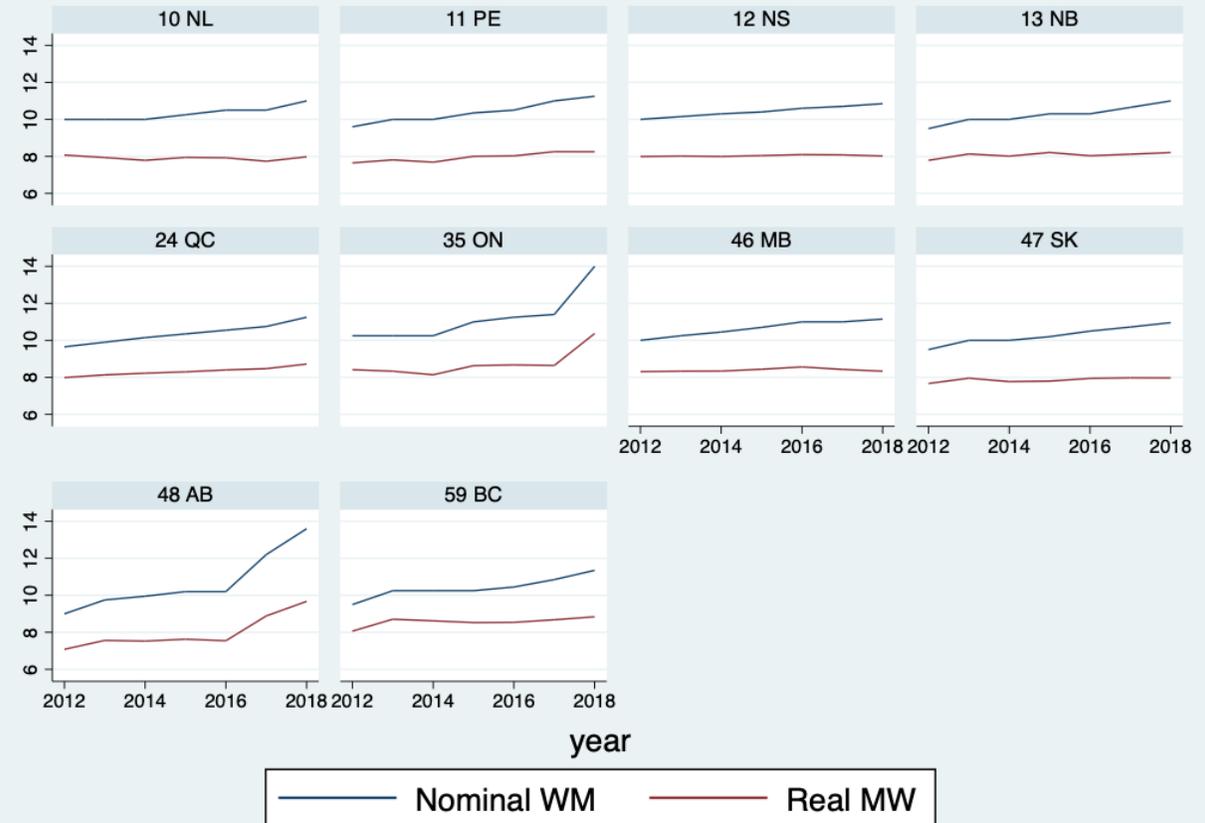
- Our earlier methods were based on DD and DDD techniques which assumed constant treatment effects.
- A number of papers demonstrate that these methods are vulnerable to non-constant treatment effects with staggered treatment and provide methods that are robust (Callaway and Sant'Anna, 2021; de Chaisemartin and D'Haultfoeuille, 2022; Borusyak et al., 2022).
- A common theme of these estimators is a reliance on groups that are not treated in the sample period.

Data (LISA)

- Canadian panel data for 2012-2018 Longitudinal and International Study of Adults (cycle 1-cycle 3)
- Sample: Age from 18-64, low educated.
- Outcomes: Self-reported general health and mental health
- Individual-level covariates include age, age square ($\text{age}^2/100$), education level, marital status, household sizes (HHS), and area of residence.
- Provincial-level covariates include Real GDP per capita and unemployment rates.

Methods

- Callaway and Sant'Anna (2021)
- Staggered design and double robust model
- Treatment model: inverse probability tilting
- Treatment cohort: AB 2017 & ON 2018
- Weights provided by the LISA
- Wild bootstrap
- Clustered at provincial level



Findings

- Evidence of some of the same changes as for NPHS in general and mental health.
- Minimum wage hikes are associated with:
 - A higher probability of reporting poor general health among females.
 - A low probability of reporting poor mental health among males.

Discussion

- Consistent with Men et al. (2021) that cite a number of studies suggesting that while results are mixed for the United States and internationally, the more typical finding (e.g. Bartfeld and Men, 2017; Reeves et al., 2021) is that minimum wage increases are associated with reduced food insecurity.
- The fruits and vegetables coefficients are not statistically significant, consistent with the results of Chapman et al. (2021) and with the results for “most households” of Palazzolo and Pattabhiramaiah (2021).
- Our DD and DDD coefficients of the inactive variable are significant and negative for females, consistent with Lenhart (2017) showing minimum wage increases are associated with an increased probability of membership in a sports club in the UK.
- An increase in minimum wage is associated decline in the likelihood of extreme distress among males (Kuroki 2021).

Conclusion

- Overall findings of mixed effects on health and related behaviours are consistent with the conclusions of Leigh et al. (2019) in their survey of U.K. and U.S. studies.
- Some evidence minimum wages are associated with poorer women's health but difficult to be confident of the result without understanding the channels.
- Some evidence minimum wages are associated with better men's mental health as well as less drinking, smoking and food insecurity; given healthier behaviours, and better mental health, surprisingly little evidence of improved general health.
- Limitation of only looking at workers.
- Neumark (2023) surveys many studies and finds mixed results; here mixed results even within the NPHS or LISA.

Thank You!