Course Outline
Economics 446
Advanced Public Economics

Professor Michael Smart   TA: Alexandre Lehoux
msmart@chass.utoronto.ca   alexandre.lehoux@mail.utoronto.ca
twitter: @michaelgsmart   office hours TBD
office hour: M10-11, GE 268

Introduction

For this course, you will write a paper on some aspect of the economics of public policy, using quantitative data. The objective of the course is to learn how economists formulate and test ideas, to learn about public policy, and to enhance your skills in working with data. Working in groups of up to 4 students, you will tackle a specific public policy issue (see the list below), and use recent Canadian data to answer some key questions that you will develop based on the suggestions below.

Your group will conduct original research, but you will be guided by the questions, approaches, and empirical methods that were used in an existing, published research paper. *Replication* is the scientific practice of repeating the research of other researchers and comparing your results to theirs. Your project will be a partial replication exercise: you should use the published paper as your guide and attempt to produce results analogous to some of those in the published paper. But you will use different (more recent, Canadian) data, and you can be creative in your research, extending it in new and different directions.

Most of these questions can be answered with simple data sets and ordinary least squares regression techniques. However, it is also important to understand your data before performing regressions. Simple descriptive statistics and data visualizations should be an important part of every group's paper. (In some cases, a good paper could be written with descriptive statistics alone, without using regression methods at all.) If you develop your ideas, do some reading, and do some hands-on work with data, then you can expect to have fun, learn something, and succeed in this course!

Software and Supplementary Readings

Computer tutorials will be conducted using Stata. You should acquire and install it on your computer by week 2 of the course. I recommend Stata/IC, available from http://sites.utoronto.ca/ic/software/detail/stata.html. A good basic introduction to Stata with links to many additional resources is at data.princeton.edu/stata. For more Stata links see www.stata.com/links.

There is no textbook for this course, but you should consult a good applied econometrics textbook before conducting your research. Two good alternatives:

Wooldridge, J.M., 2015. *Introductory econometrics: A modern approach*. Nelson Education.

Angrist, J.D. and Pischke, J.S., 2014. *Mastering 'metrics: The path from cause to effect*. Princeton University Press.

<u>Grading</u>

Research Proposal	10%
Literature Review	15%
Class Presentations	20%
Class Participation	15%
Final Paper	40%

Late papers will be assigned a penalty of 10% per week. Note: Every group member must contribute to either Class Presentation #1 or #2 (see below).

<u>Assignments</u>

You will prepare short written and oral reports throughout the term as follows:

1. Individual research proposal (2-3 pages, one per student): A brief report that indicates in your own words: (i) your topic, including a clearly stated research question to be answered by your empirical work; (ii) data sources for your empirical analysis; (iii) a short list of published research papers you intend to read and draw on for your work.
    <u>Due</u>: Week 3, Monday. <u>Points</u>: 7 (part of Research Proposal)

2. Group proposal and work plan (3 pages, one per group): Write a brief research proposal based on the individual proposals above. Identify the key tasks for your project, including literature review, obtaining data, and planned tables and figures for your paper. Each group will identify one student with primary responsibility for each of these tasks:
    a) team coordinator
    b) assembling data sets
    c) writing introduction and literature review sections
    d) data visualizations, including graphs and maps as appropriate
    e) data analytics, including regressions, and writing results section (<u>2 names</u> – specify separate tasks)
    f) Presentations coordinator
    g) final editor of paper
    (Tasks will overlap and be shared as appropriate, but one student must have primary responsibility for each. Your grades will have both a team and individual component.) The work plan must identify a student for each task on this list, and if you trade tasks you should inform me as soon as possible.
    <u>Due</u>: Week 3, Friday. <u>Points</u>: 3 (part of Research Proposal)

3. Peer evaluation (1 page, one per student): Each student will be assigned to read the research proposal and work plan of one other group and submit brief comments and evaluation. A rubric will be provided.
    <u>Due</u>: Week 4, Thursday. <u>Points</u>: 4 (part of Class Participation)

4. Class presentation #1: Prepare a 10-minute presentation on your policy questions and the key paper that will guide your work. At least 2 and no more than 3 students should speak. A class discussion will follow each presentation.

5. Literature review (1-2 pages, one per student): Each student writes a summary of the guiding paper for your topic (marked below with *) plus one other paper. If you choose. paper not on the list provided, get approval first. A brief summary of what the papers say, their methodology and key results, implications for your key research question, and how their methods relate to your own empirical strategy. Students should share their drafts with others in the group in advance and learn from each other.
   Due: Week 5, Thursday. Points: 15

6. Preliminary empirical results (2-3 pages, one per group): A document showing your main empirical strategy (for example, a regression equation) and one table of empirical results (e.g. variable means, crosstabs, or preliminary regression estimates). Attach stata do and log files.
   Due: Week 8, Monday. Points: 3 (part of Final Paper)

7. Class presentation #2: Come to class for a short, informal presentation of your ideas and preliminary results (20 minutes maximum). A class discussion will follow each presentation. At least 2 and no more than 3 students should speak, and each team member should speak during Presentation #1 or #2.
   Due: Weeks 11 and 12. Points: 10

8. Final paper (approx. 20 pages): A complete paper including introduction with clearly stated research objectives, literature review based on your earlier submissions, description of data and empirical strategy, and empirical results. Attach stata do and log files. Students will be graded in part on the section of the paper they are mainly responsible for, and partly on the overall assessment of the group.
   Due: Week 12, Tuesday. Points: 40

Use of Quercus for collaborations

Whenever possible, use Quercus to share notes and communicate with group members. Your team coordinator is responsible for uploading the following documents to your Quercus group page:
- Google sheet listing team members and their primary responsibilities
- Google sheet listing tasks and their completion dates
- Collaborate page for chat (?)

Note that your class participation score will be based on your activity within your Quercus group page.

Finances of the Nation

The Finances of the Nation project assembles research data sets on public policies in Canada. Some of these data may be useful for your work – e.g. on tax rates, income distribution, and government revenue and expenditure in Canada. Finances of the Nation also produces short research reports on public policy. Students producing the best paper in Economics 446 this year will be invited to write a summary of their work for publication on FinancesoftheNation.ca. FON hires summer interns; if you are interested in applying, contact me.

Schedule

There are no regular lectures after week 3. Instead, we will use scheduled class time for guided group work and student presentations, as follows (precise schedule for group presentations to be determined):

Week 1: Introduction
Week 2: Empirical public policy analysis: Read lecture notes in advance
Week 3: Computer Lab: Introduction to data analysis: Bring your computer
Week 4: Guided Group Work (on data analysis or literature review – each team may choose)
Week 5: Class Presentation #1: Research Proposal and Literature review
Week 6: Guided Group Work: Bring your computer
Week 7: Guided Group Work: Bring your computer
Week 8: Progress Report: Be prepared to discuss your preliminary results with the class
Week 9: Progress Report: Be prepared to discuss your preliminary results with the class
Week 10: Guided Group Work: Bring your computer
Week 11: Class Presentation #2: Preliminary results
Week 12: Class Presentation #2: Preliminary results (continued)

Turnitin

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

Topics

Choose a project to work on. Sign up via quercus beginning Wednesday or week 1 at 9 am (maximum 4 students per group). The following pages describe each of the projects in detail.

1. Minimum wages, employment, and earnings

Issues: How has Ontario's 2018 increase in the minimum wage affected employment, earnings, and the wellbeing of low-wage workers? Did this policy benefit low-income families, or was it poorly targeted? Did employers respond by decreasing employment?

Research objectives:

- Use the Canadian Income Survey, 2012-17, to identify workers likely affected by the minimum wage and describe them. For example, how do their age, education level, immigration status, family incomes, and so on compare to the rest of the population?
- Show changes in employment and earnings for Ontario and other provinces around the change. Focus on industries and age groups most likely to be affected. What other economic factors might be relevant here?
- Use the synthetic control methodology to estimate what employment and earnings would have been in the absence of the policy change.

Papers:

- *Jardim, Ekaterina, Mark C. Long, Robert Plotnick, Emma Van Inwegen, Jacob Vigdor, and Hilary Wething, 2017. Minimum wage increases, wages, and low-wage employment: Evidence from Seattle. Working Paper 23532. National Bureau of Economic Research, https://www.nber.org/papers/w23532
- Reich, Michael and Allegretto, Sylvia and Godøy, Anna, Seattle's Minimum Wage Experience 2015-16, https://ssrn.com/abstract=3043388.
- Abadie, A., 2019. Using synthetic controls: Feasibility, data requirements, and methodological aspects. *Journal of Economic Literature*, https://economics.mit.edu/files/17847, and Abadie, Alberto, Alexis Diamond and Jens Hainmueller 2015. Comparative Politics and the Synthetic Control Method. *American Journal of Political Science,* https://web.stanford.edu/~jhain/Paper/AJPS2015a.pdf
- Campolieti, M., 2020. Does an Increase in the Minimum Wage Decrease Employment? A Meta-Analysis of Canadian Studies. *Canadian Public Policy*, *46*(4), pp.531-564.
- Fossati, S. and Marchand, J., 2020. *First to $15: Alberta's Minimum Wage Policy on Employment by Wages, Ages, and Places* (No. 2020-15), https://sites.ualberta.ca/~econwps/2020/wp2020-15.pdf
- Statistics Canada, 2018. Recent Changes in the Composition of Minimum Wage Workers. Cat. No. 75-006-X

Data sources:

- Canadian Income Survey Public-Use Microdata Files
- Labour Force Survey Public-Use Microdata Files
- Average weekly earnings by industry, monthly, unadjusted for seasonality
- Employment by industry, monthly, unadjusted for seasonality
- Labour force characteristics by economic region
- Labour force characteristics, monthly
- Minimum wages by province

2. Income taxes on the rich

Issues: Top marginal income tax rates on the rich increased at the federal level in 2016, and have increased in most provinces since 2010. What is the impact of this change on government revenues, redistribution, and economic efficiency?

Research objectives:

- Show how federal and provincial marginal and average tax rates have changed in the top tax brackets since 2010. Show how top incomes have changed since 2010. Draw graph and/or maps to show what has been happening.
- Estimate the causal effect of the 2016 federal tax rate increase on reported incomes of top-bracket taxpayers, using the estimation techniques in Saez (2017). What components of income and which taxpayers responded most? Explore the impact of provincial tax changes, using the methods described in Milligan and Smart (2015).
- Use your estimates to simulate the effect of recent tax rate changes on tax revenues of federal and provincial governments. Were the tax rate increases justified?

Papers:

- *Saez, E., 2017. Taxing the rich more: Preliminary evidence from the 2013 tax increase, *Tax Policy and the Economy* 31(1), 71-120.
- Milligan, K. and Smart, M., 2015. Taxation and top incomes in Canada. *Canadian Journal of Economics*, *48*(2), pp. 655-681, https://doi.org/10.1111/caje.12139.
- Parliamentary Budget Office, 2019. Revisiting the Middle Class Tax Cut, Technical Report.
- Saez, E. and Veall, M.R., 2005. The evolution of high incomes in Northern America: lessons from Canadian evidence. *American economic review*, *95*(3), pp.831-849, and Veall, M.R., 2012. Top income shares in Canada: recent trends and policy implications. *Canadian Journal of Economics*, *45*(4), pp.1247-1272.
- Department of Finance (2010) "The response of individuals to changes in marginal income tax rates." Report of Federal Tax Expenditures, https://www.canada.ca/content/dam/fin/migration/taxexp-depfisc/2010/TEE2010_eng.pdf

Data sources:

- High income tax filers in Canada , https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110005601
- Top Marginal Tax Rates: https://www.taxtips.ca/tax-rates.htm or Finances of the Nation
- Detailed data from the Canada Revenue Agency on incomes and tax payments https://www.canada.ca/en/revenue-agency/programs/about-canada-revenue-agency-cra/income-statistics-gst-hst-statistics/preliminary-statistics.html)
- Income and taxation statistics by province and percentile of income distribution: https://financesofthenation.ca/t1-income-statistics/

3. Tobacco taxes and tax avoidance: The effects of e-cigarettes and smuggling

Issues: Are high cigarette taxes an effective way to reduce smoking, or do smokers substitute towards untaxed purchases? What is the price elasticity of demand for cigarettes, and how has it changed since new alternatives to taxed cigarette purchases have been introduced (such as smuggled or bootlegged cigarettes and e-cigarettes)?

Research objectives:

- Using data on sales, prices, tax rates, and tax revenues, describe the patterns over time and across provinces. (Draw some maps.) Are there big changes since e-cigarettes have become available?
- Using the techniques in Gruber et al. (2003), estimate the price elasticity of sales. How does elasticity differ over time and among provinces?
- Get data from CTADS on prevalence of bootlegged and e-cigarettes by province. Can differences in access to these substitutes explain elasticity differences?
- What will be the likely impacts of bootlegged and e-cigarettes in the future? Are tobacco tax revenues falling, and is this a problem for governments?

Key papers:

- *Gruber, J., Sen, A. and Stabile, M., 2003. Estimating price elasticities when there is smuggling: the sensitivity of smoking to price in Canada. *Journal of Health Economics*, *22*(5), pp.821-842, https://doi.org/10.1016/S0167-6296(03)00058-4.
- Sen, A. and Wirjanto, T., 2010. Estimating the impacts of cigarette taxes on youth smoking participation, initiation, and persistence: empirical evidence from Canada. *Health economics*, *19*(11), pp.1264-1280,
- Guindon, G., Burkhalter, Robin, and Brown, K. 2017, Levels and trends in cigarette contraband in Canada\. Tobacco Control 26: 518-525.
- Schwartz, R. and Zhang, B., 2016. Debunking the taxation–contraband tobacco myth. *CMAJ*, *188*(6), pp.401-402,
- Philip DeCicca, Donald S. Kenkel, Michael F. Lovenheim, and Erik Nesson, 2018. The Economics of Smoking Prevention. Health Economics,

Aggregate data sources:

- Cigarette prices: Consumer Price Index, annual average, not seasonally adjusted
- Cigarette sales 2001-2017 and Cigarette sales, 1980-2014
- Tobacco purchases: Detailed household final consumption expenditure, provincial and territorial, annual
- Tobacco tax rates: University of Waterloo (2009). Tobacco Use in Canada: Policy Supplement.
- Tobacco tax revenues: https://FinancesoftheNation.ca

Micro data sources:

- Canadian Tobacco, Alcohol and Drugs Survey
- Canadian Tobacco Use Monitoring Survey (pre-2013) and overview of CTUMS data
- Consult Finances of the Nation for tobacco tax revenue data

4. Child benefits, work, and poverty

Issues: In 2016, the federal government introduced the Canada Child Benefit that substantially increased transfers to families with children. How did the CCB affect incomes and incentives to work for various types of Canadian familes (e.g. single parents, and one- and two-earner couples)? How have incomes and labour earnings of the affected families changed?

Research objectives:

- Using data on benefits and taxes assembled by the Finances of the Nation project, describe the 2016 changes to family benefits for different family types and income levels. Discuss both average benefit levels and marginal tax rates at various income levels. Draw some graphs.
- Using the methods in Hoynes and Patel (2015) and microdata from the Canadian Income Survey, 2012-17, estimate how government transfers, labour earnings, total incomes, and poverty rates have changed over time for different family types.
- Estimate the effect of the CCB on income and labour supply of affected families. What is an appropriate treatment and control group for this comparison? How much was the CCB responsible for changes in income and work after 2016?

Papers:

- *Hoynes, H.W. and Patel, A.J., 2018. Effective policy for reducing poverty and inequality? The Earned Income Tax Credit and the distribution of income. *Journal of Human Resources*, *53*(4), pp.859-890. https://www.nber.org/papers/w21340
- Kleven, H., 2019. The EITC and the extensive margin: A reappraisal (No. w26405). National Bureau of Economic Research, https://www.henrikkleven.com/uploads/3/7/3/1/37310663/kleven_eitc_feb2020.pdf
- Kesselman, J.R., 2019. Policy Options for Retargeting the Canada Child Benefit. *Canadian Public Policy*, *45*(3), pp.310-328. https://doi.org/10.3138/cpp.2019-003
- Schirle, T., 2015. The effect of universal child benefits on labour supply. *Canadian Journal of Economics 48*(2), pp.437-463. https://doi.org/10.1111/caje.12132
- Jones, L.E., Milligan, K. and Stabile, M., 2019. Child cash benefits and family expenditures: Evidence from the National Child Benefit. *Canadian Journal of Economics*, *52*(4), pp.1433-1463.

Data sources:

- Statistics Canada, 2019. Canadian Income Survey, 2012-2017 https://www150.statcan.gc.ca/n1/daily-quotidien/190226/dq190226b-eng.htm
- Canadian Income Survey Public-Use Microdata Files
- The Canada Child Benefit
- Government Child and Family Benefits Programs on taxtips.ca
- Data on benefit levels and marginal tax rates from https://FinancesoftheNation.ca

5. Economic factors in the opioid epidemic

Issues: Canada and the U.S. have experienced a sharp rise in opioid use that some have described as an epidemic. It is known that drug use increases following periods of unemployment and other economic hardships. To what extent are economic factors related to the opioid crisis in Canada?

Research objectives:

- Obtain data from the Canadian Institute for Health Information on opioid-related hospitalization by municipality (census subdivision or CSD). Using the CIHI data and other data you obtain, describe the extent of opioid related harms in Canada.
- What are the geographic and demographic patterns of opioid use? Draw maps to show patterns and evolution over time.
- Following the methodologies in the papers by Hollingsworth et al. and Currie et al., to the extent possible, examine how opioid harms are related to unemployment and other economic and demographic factors at the CSD level. Can you estimate the causal effect of an increase in unemployment on opioid harms?

Papers:

- *Currie, J., Jin, J.Y. and Schnell, M., 2018. *US Employment and Opioids: Is There a Connection?* (No. w24440). National Bureau of Economic Research. https://www.nber.org/papers/w24440
- Hollingsworth, A., Ruhm, C.J. and Simon, K., 2017. Macroeconomic conditions and opioid abuse. *Journal of health economics*, *56*, pp.222-233. https://doi.org/10.1016/j.jhealeco.2017.07.009
- Maclean, J.C., Mallatt, J., Ruhm, C.J., Simon, K., Dave, D., Lieber, E., Powell, D. and Schnell, M., 2020. Economic studies on the opioid crisis: A review. NBER Working Paper, 28067, https://www.nber.org/papers/w28067
- v
- v

Data sources:

- Canadian Institute for Health Information, Opioid-Related Harms and Data Tables
- Hospitalization Rates by Census Subdivision, 2007-2016 http://www.cihi.ca/sites/default/files/document/mthic-cihi-indicators-cma-csd-en-web.xlsx
- 2011 National Household Survey Profiles
- 2016 Census Profiles

6. GST cut as a fiscal stimulus

    Issues: Some have suggested a reduction in the Goods and Services Tax rate as an effective way for the government to stimulate the economy as the pandemic ends. How much would this cost, and how would it affect consumer prices and consumer spending?

    Research objectives:
    - Identify past provincial and federal sales tax rate changes, and examine their effects on consumer prices and consumption expenditures.
    - Adapt the methodology in Crossley, Low, and Sleeman (2014) to Canadian subnational data: Use difference-in-difference or synthetic control methods to identify a control group for provinces and commodity groups affected by the tax changes.
    - Based on your estimates, propose a reduction in the GST rate for 2022 and simulate its economic effects.

    Papers:

    - *Crossley, T.F., Low, H.W. and Sleeman, C., 2014. Using a temporary indirect tax cut as a fiscal stimulus: evidence from the UK (No. W14/16). Working Paper. Institute for Fiscal Studies.
    - Crossley, T.F., Low, H. and Wakefield, M., 2009. The economics of a temporary VAT cut. *Fiscal Studies*, *30*(1), 3-16.
    - Cashin, D. and Unayama, T., 2016. Measuring intertemporal substitution in consumption: Evidence from a VAT increase in Japan. *Review of Economics and Statistics*, *98*(2), 285-297.
    - Benzarti, Y. and Carloni, D., 2019. Who really benefits from consumption tax cuts? Evidence from a large VAT reform in France. *American economic journal: economic policy*, *11*(1), pp.38-63.
    - Benzarti, Y., Carloni, D., Harju, J. and Kosonen, T., 2020. What goes up may not come down: asymmetric incidence of value-added taxes. *Journal of Political Economy*, *128*(12), pp.4438-4474.
    - Blundell, R., P. Level, and H. Miller, 2020, A temporary VAT cut could help stimulate the economy, but only if timed correctly, Briefing notes, Institute for Fiscal Studies, https://www.ifs.org.uk/publications/14903
    - Smart, M. and Bird, R.M., 2009. The economic incidence of replacing a retail sales tax with a value-added tax: Evidence from Canadian experience. *Canadian Public Policy*, *35*(1), pp.85-97.

    Data sources:

    - Consumer Price Index, monthly, not seasonally adjusted, by province, Table 18-10-0004
    - Detailed household final consumption expenditure, provincial and territorial, annual, Tables 36-10-0432 and -0225
    - Statutory sales tax rates from FinancesoftheNation.ca

7. Capital gains taxation

Issues: In Canada, only 50% of realized capital gains are included in taxable income, resulting in lower tax rates on shareholder gains than other forms of income. This raises issues of equity and efficiency in taxation. It is frequently argued that capital gains taxation gives rise to a "lock-in effect," whereby high tax rates make investors reluctant to sell shares and realize gains. If so, then raising capital gains tax rates could actually cause tax revenue to fall.

Research objectives:
- Describe the system of capital gains taxation in Canada and its impact on income inequality.
- Estimate the impact of tax rates on capital gains realizations, adapting the event-study methodology of Agersnap and Zidar (2020) to Canadian provincial data.
- Using your estimates, simulate the impact of a capital gains tax increase on tax revenue.

Papers:

- *Agersnap, O. and Zidar, O., 2020. The tax elasticity of capital gains and revenue-maximizing rates. *NBER Working Paper*, (w27705).
- Bakija, J.M. and Gentry, W.M., 2014. Capital gains taxes and realizations: Evidence from a long panel of state-level data. *Unpublished Manuscript, Williams College*.
- Burman, L.E. and Randolph, W.C., 1994. Measuring permanent responses to capital-gains tax changes in panel data. *The American economic review*, pp.794-809.
- Murphy, B., Veall, M. and Wolfson, M., 2015. Top-End Progressivity and Federal Tax Preferences in Canada: Estimates from Personal Income Tax Data. *Can. Tax J.*, *63*, p.661.
- Minas, J. and Lim, Y., 2013. Taxing capital gains-views from Australia, Canada and the United States. *eJTR*, *11*, p.191.
- Vaillancourt, F. and Kerkhoff, A., 2018. Capital gains taxation in Canada, 1972-2017: evolution in a federal setting. *eJTR*, *16*, p.340.
- Auerbach, A.J. and Poterba, J., 1988. Capital gains taxation in the United States: Realizations, revenue, and rhetoric. *Brookings Papers on Economic Activity*, *1988*(2), pp.595-637.

Data sources:

- Top marginal tax rates by province and year, from FinancesoftheNation.ca
- Taxable capital gains, Capital losses of other years, and Capital gains deduction, by province, year, and percentiles of the income distribution, from FinancesoftheNation.ca

8. Covid and the effectiveness of social distancing mandates

Issue: The business lockdowns and other social distancing mandates enacted in response to Covid have been controversial. In Canada, which governments have been most aggressive with lockdowns, and what has driven policy choices? How effective have policies been in changing people's behaviour and slowing the spread of the virus?

Research objectives:

- Using narrative methods, document the change in social distancing policies (also known as non-pharmaceutical interventions, or NPIs) in Canadian provinces and cities. Which jurisdictions were fast to implement shutdowns, and which slow? Which sectors were most affected by mandates? How did public sentiment around social distancing change over time, and did this lead or lag changes in policies?
- Obtain data on social distancing behaviour from cellphone mobility records, restaurant reservations, etc. Document changes in mobility patterns across Canada in 2020.
- Using the event study methods in Gupta et al. (2020), show how various measures of human mobility changed in response to policies at the provincial and health region level.
- Do responses to policy vary by province or region of the country? To what extent does this political sentiments of residents of the region? In particular, are residents of Alberta and Quebec different in how they perceive coronavirus and the need to engage in social distancing?

Papers:

- *Gupta, S., Simon, K.I. and Wing, C., 2020. Mandated and voluntary social distancing during the covid-19 epidemic: A review. NBER Working Paper 28139, https://www.nber.org/system/files/working_papers/w28139/w28139.pdf
- Armstrong, D.A., Lebo, M.J. and Lucas, J., 2020. Do COVID-19 Policies Affect Mobility Behaviour? Evidence from 75 Canadian and American Cities. *Canadian Public Policy*, *46*(S2), pp.S127-S144, https://www.utpjournals.press/doi/pdf/10.3138/cpp.2020-062
- Gupta, S., Simon, K.I. and Wing, C., 2020. Mandated and voluntary social distancing during the covid-19 epidemic: A review. NBER Working Paper 28139, https://www.nber.org/system/files/working_papers/w28139/w28139.pdf
- Breton , C., 2020. "How the Provinces Compare in Their COVID-19 Responses" *Policy Options*, https://policyoptions.irpp.org/magazines/april-2020/how-theprovinces-compare-in-their-covid-19-responses/
- Giuliano, P., and I. Rasul Compliance with social distancing during the Covid-19 crisis, https://voxeu.org/article/compliance-social-distancing-during-covid-19-crisis
- Detailed narrative of policy changes from https://www.reopeningaftercovid.com/

Data sources:

- Social distancing mandates by jurisdiction from https://www.reopeningaftercovid.com/
- Mobility trends data from OpenTable, Google and Apple
- Covid cases and mortality data from https://opencovid.ca/
- Statistics Canada, 2020. Impacts of COVID-19 on Canadians: Data Collection Series https://www.statcan.gc.ca/eng/survey/household/5323

9. Covid and excess mortality

Issue: The actual death toll due to Covid-19 may differ from reported levels, because of (i) inconsistencies in the way of cause of death is recorded in various jurisdictions, (ii) deaths due to other proximate causes influenced by the pandemic and the lockdowns. Estimates of excess mortality due to Covid-19 by age group and jurisdiction are useful in understanding the true impact of the virus and the actual years of life lost to it.

Research objectives:

- Obtain data on mortality from Canadian Vital Statistics Death Database, and use it to estimate excess deaths by age group, province, and week during 2020. Consider alternative models for estimating the "counterfactual" number of deaths that would have occurred in the absence of the virus.
- Compare estimated excess mortality to reported Covid deaths and to active Covid cases. What can we learn from the differences? Report Population Fatality Rates by age group based on the data. How does Covid compare to other leading causes of death?
- Which demographic groups have been hit hardest? Are these patterns different in the first and second waves of the pandemic during 2020? Can you estimate total years of life lost to the virus so far?
- What do your estimates tell us about the effectiveness of measures to protect residents in long-term care homes? about which demographic groups should be first in line to receive a vaccine?

Papers:

- *Décarie, Y. and Michaud, P.C., 2020. *Counting the Dead: COVID-19 and Mortality in Québec and British Columbia* (No. 2008), Working Paper, CIRANO, http://creei.ca/wp-content/uploads/2020/11/cahier_20_08_counting_dead_covid_19_mortality_quebec_british_columbia.pdf
- Mulligan, C., 2021. Deaths of Despair and the Incidence of Excess Mortality in 2020. National Bureau of Economic Research. Work Paper No. 28303, https://www.nber.org/papers/w28303
- Giattino, C., H. Ritchie, M. Roser, E. Ortiz-Ospina and J. Hasell, 2020, Excess mortality during the Coronavirus pandemic, https://ourworldindata.org/excess-mortality-covid
- Statistics Canada, 2020. Provisional death counts and excess mortality, January to October 2020, *The* Daily, Dec. 24, 2020, https://www150.statcan.gc.ca/n1/daily-quotidien/201224/dq201224b-eng.htm
- Arthi, V. and Parman, J., 2020. Disease, downturns, and wellbeing: Economic history and the long-run impacts of COVID-19. *Explorations in Economic History*, p.101381, https://www.nber.org/system/files/working_papers/w27805/w27805.pdf

Data sources:

- Weekly death counts, by age group and sex (Canadian Vital Statistics Death Database), Tables 13-10-0768-01 and 13-10-0783-01
- Covid cases and mortality data from https://opencovid.ca/
- Leading causes of death, total population, by age group, Table 13-10-0394