

Social distancing mandates reduce small business electricity usage across Ontario

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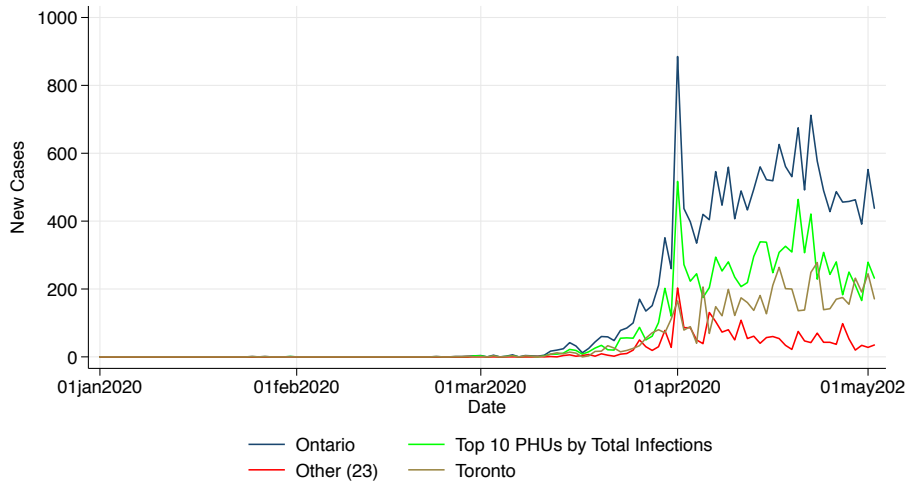
Summary

1. We used the year over year decline in electricity usage of small businesses to understand the impact of social distancing on economic activity.
2. Despite different infection rates across Ontario, province wide government mandates have led to uniform decreases in economic activity. Even in places with few infections, distancing policies, which may be less effective due to so few cases, are having large impacts on economic activity.
3. While our estimates show that people change how they practice social distancing based on the number of local infection cases, most of their behavior is determined by the provincial wide mandates.
4. These findings suggests that easing social distancing mandates in locations with few cases will lead to increased economic activity in a safer way than uniformly lifting social distancing practices across the province.
5. Our next briefing note will study the efficacy of province wide social mandates on mitigating the transmission of the disease across Ontario.

Keywords: Social distancing mandates, disease diffusion, electricity usage, Ontario, regional variation

*This note is based on our working paper, Abdelrahman Amer, Angelo Melino & Aloysius Siow (2020), "The effect of social distancing mandates on small commercial electricity users across Ontario", Department of Economics, University of Toronto. We thank the IESO for providing timely access to aggregate electricity usage data by census divisions. No micro data was provided. We also thank Rida Aamer for providing the data on the social distancing mandates. We also thank SSHRC and the University of Toronto for financial support. The views expressed here are those of the authors and do not represent the views of the IESO or the University of Toronto.

Figure 1: New Cases Per Day In Three Ontario Regions



The first case of Covid-19 infection in Ontario was reported on January 25, 2020 in Toronto.¹ The disease spread rapidly and unevenly across Ontario. As of April 26, there were 14,413 confirmed cases. There are 49 census divisions in Ontario which are allocated to 34 public health units. Figure (1) shows the diffusion of daily new cases across Ontario in three groups of public health units. The top half of Figure (2) shows that the distribution of the current infection rates per 10,000 individuals by public health units April 7-15, 2020. It shows that the infection rates differ significantly across PHUs.

In order to slow the diffusion of the disease, Ontario policy makers successively more stringent social distancing mandates. With the exception of Toronto, they are imposed uniformly across Ontario. Second, most of these mandates were imposed within a short time window, between March 13 and 18. Figure (3) plots the cumulative sum of the various mandates and recommendations for both Ontario and Toronto.

¹Data on infections from Berry I, Soucy J-PR, Tuite A, Fisman D. Open access epidemiologic data and an interactive dashboard to monitor the COVID-19 outbreak in Canada. CMAJ. 2020 Apr 14;192(15):E420. doi: <https://doi.org/10.1503/cmaj.75262>

Figure 2: Average of Currently Infected Per 10,000 Population, April 07-15. Average % Change in Daily Electricity Consumption, Mar 15 - April 15

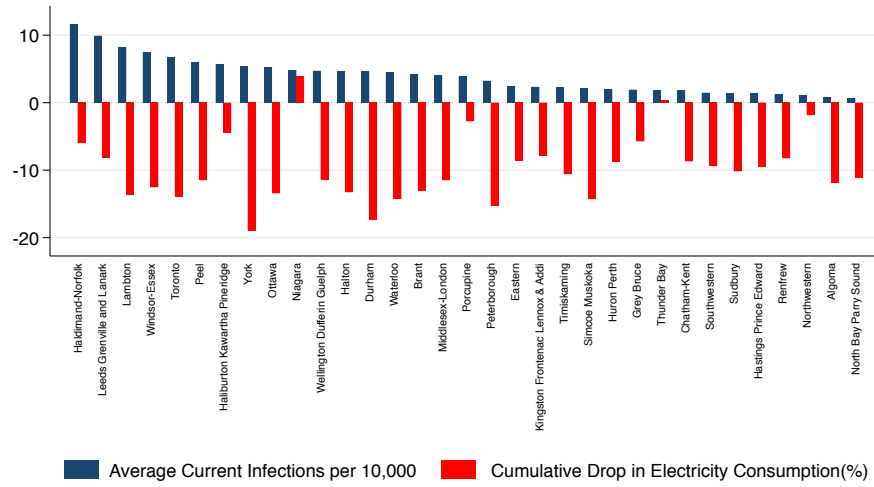


Figure 3: Cumulative Index of Social Distancing Recommendations and Mandates in Ontario²

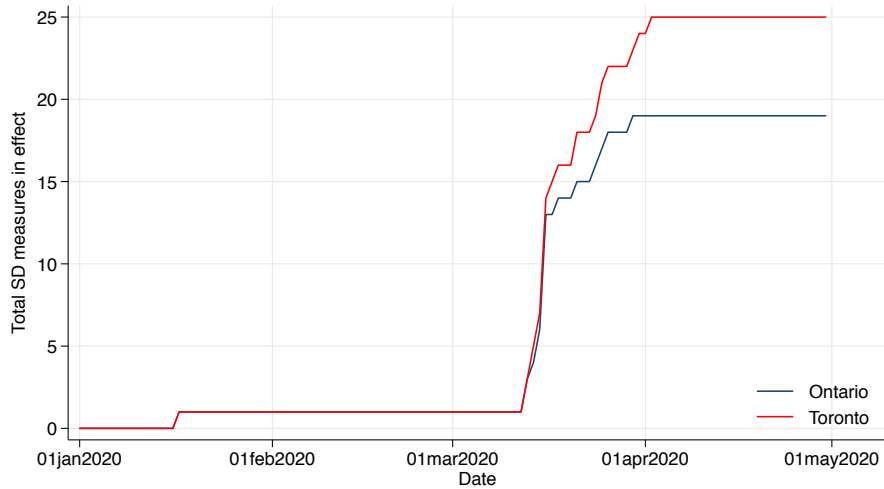
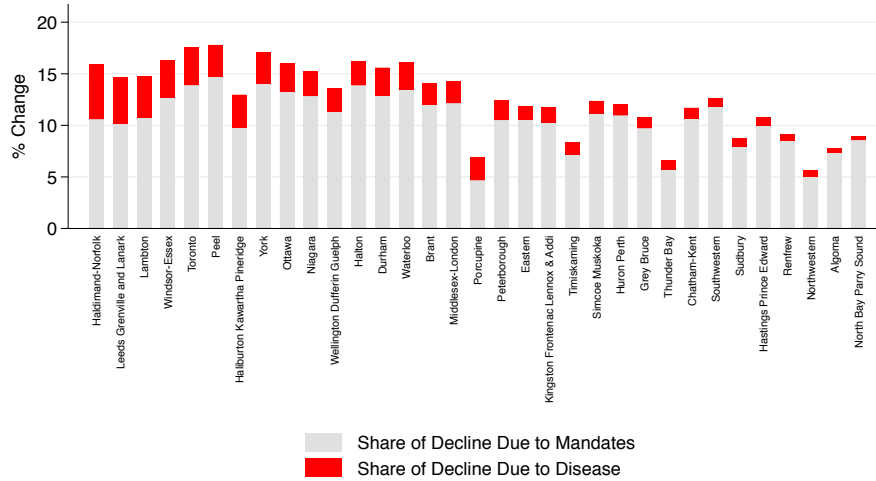


Figure 4: Average Percentage Drop in Daily Electricity Consumption, Mar 15 - April 15



Currently, there is no systematic high frequency, daily or weekly, and regional information from official sources on the socioeconomic effects of social distancing mandates in Ontario. With non-essential businesses shut down and workers in essential businesses are working at home, electricity usage by commercial users decreased. This briefing note analyzes daily aggregate electricity usage by small commercial users (≤ 50 kWh) at the public health unit level in Ontario until April 15, 2020. The bottom half of Figure (2) shows the average percentage declines in daily electricity usage by public health units between March 15-April 15. The figure shows that the declines in electricity usage across public health units were not closely related to infection rates in those units. I.e., the decline in economic activity in a region was not closely correlated with the spread of the disease in it.

Individuals will voluntarily practice social distancing due to fear of the spread of the disease and also practice social distancing due to government mandates. We estimated how much the decline in electricity usage in a public health unit region was due to social distancing mandates and how much of it was due to fear of the spread of the disease. Figure (4) shows the average drop in daily electricity usage from March 15-April 15 relative to the daily average between January and February due to mandates and disease concern. The public health units are arranged in decreasing infection rates. The figure shows that PHUs with higher infection rates have larger declines in electricity usage, displaying a higher compliance with the social distancing mandates and also responding more to the spread of the disease. The declines in electricity usage

²From Rida Aamer, “COVID-19 Social Distancing Mandates and Shutdowns in Ontario, May 11, 2020”, www.covid.economics.utoronto.ca

in many of the public health units with low infection rates are primarily due to mandates and not fear of the spread of the disease. Our model predicts that residents of these communities will be most dissatisfied with the uniform social distancing mandates across the province.

Our next briefing note will study how social distancing mandates across the province affects the diffusion of the disease across Ontario.