

COVID Shutdown Regulations Negatively Impact Employment and Sales of Restaurants in Ontario*

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Abstract

Due to the world-wide COVID-19 pandemic, shutdown restrictions on businesses and facilities have limited economic activities into a recession. This paper examines the shutdown effect on restaurants by reopening a city in Ontario (Peterborough) and comparing its restaurant operating situation with that of another city (Brantford) after three months reopening. The survey result indicates that shutdown restrictions have negative impacts on restaurant employment, sales and future operation. However, the higher increased COVID cases in the reopened city suggests the Ontario government to mindfully plan for further policy decisions.

1 Introduction

The COVID-19 pandemic has impacted many businesses, including restaurants, and resulted in mass-layoffs of workers throughout the world. According to HuffPost (Tencer 2020), “Canada’s unemployment rate was 13.5% in May 2020, the highest it has been since 1976” (Wikipedia, n.d.). However, the unemployment crisis in Canada, which would result in rising rates of depression, suicide, frustration, crime, and other unprecedented social issues, was proactively considered and managed by the Government of Canada. The Canada Emergency Wage Subsidy (CEWS) (Canada, n.d.b) as well as the Canada Emergency Rent Subsidy (CERS) (Canada, n.d.a) programs were enacted swiftly and served as much needed lifelines for businesses to survive. The Ontario government also provided a range of support such as provincial tax rebates, loans and debt relief interventions, utility bill payment reductions, business grants, and low-interest loans, etc(Ontario, n.d.).

To help recover from the current recession, we at Petit Poll have partnered with the Ontario government to examine the effects and scope of COVID shutdown on restaurants. We conducted an experiment by selecting two statistically similar cities in Ontario and investigated how reopening the dine-in services for restaurants in one city has prevailed over the state of continued shutdown in another city. We compared unemployment rates, restaurant profitability, and the expected financial and social impact in both circumstances. The results showed that general satisfaction, a sense of purpose, hope, and profitability increase among the businesses that were allowed to re-open. The findings can be generalized to other similar businesses and their associated families and business partners in that city as well. In addition, the governmental support programs for small businesses in both cities contributed substantially to the social wellbeing and recovery pathway of all businesses. However, the higher comparative rate of COVID cases in the city under treatment resulted in general anxiety among residents, triggered the social health advocates and activists to criticize the government reopening effort, and undermined the projected benefits. We then came across the trade-off between opening or closing the public parts of restaurants - or other similar businesses, for which we suggested utilizing SSM (Soft System Methodology) to collect, consider and accommodate all residents’ perspectives and potential viewpoints in society.

*Code and data are available at: https://github.com/honn-ishinn/restaurants_covid_shutdown

2 Data

Our data explores shutdown effects on restaurant businesses in Ontario. We analyzed it using R (R Core Team 2020), and packages `tidyverse` (Wickham et al. 2019), `stringr` (Wickham 2019), `here` (Müller 2020), `ggpubr` (Kassambara 2020), `janitor` (Firke 2021). We used R packages `cansim` (Shkolnik 2020), `httr` (Wickham 2020), `xml2` (Wickham, Hester, and Ooms 2020) to decide our intervention and sampling method, and packages `bookdown` (Xie 2016), `kableExtra` (Zhu 2020), `ggrepel` (Slowikowski 2021) to format the document. We referenced *Impact Evaluation in Practice* (Gertler et al. 2016) and *Sampling Theory and Practice* (Wu and Thompson 2020) to design our experiment.

2.1 Intervention

Partnered with the Ontario government, we want to examine the shutdown effects on restaurant businesses in Ontario. The plan of the experimental design was to reopen all restaurants (i.e. enable the dine-in option) in particular Ontario regions, while enforcing current provincewide shutdown restrictions (i.e. disable the dine-in option) on restaurants in the rest of Ontario regions. And after the three-month reopening, we compare restaurant operating situations in reopened regions with those in shutdown regions through data collected from online surveys of restaurant owners.

However, due to current COVID pandemic, any loosening of shutdown restrictions increases chances of COVID exposures, resulting in challenges on public health and healthcare of reopened regions. It is highly risky and hasty to reopen a large area of Ontario regions for the sole purpose of our experiment. Therefore, we mindfully chose Peterborough, a relative small size Single-tier¹ city 125 kilometers northeast of Toronto, as the only region to reopen in Ontario and then compared its restaurant operating situations with those in Brantford, another Single-tier city 105 kilometers southwest of Toronto with similar population. Since demographics, land areas and more importantly, restaurant operating situations between these two cities are quite similar with each other², we consider these two cities as valid comparison cities that could yield an accurate estimate of restaurant businesses shutdowns. In our experiment, we assigned restaurants in Peterborough as the treatment group and those in Brantford as the control group. We also ensured restaurants within these two cities to have equal opportunities receiving government support (e.g. subsidies, grants, etc.) to estimate the true impact of shutdown effects on restaurant businesses after three-month reopening in Peterborough.

Starting from October, 2020, the Ontario government reopened Peterborough while keeping shutdown restrictions on the rest of Ontario regions. After a three month period in January 2021, we at Petit Poll started to conduct survey on restaurants in Peterborough and Bratford about their business performance from October to December. Survey results are released in February 2021.

2.2 Sampling Methods

This experiment considered all Ontario restaurants as its target population. The frame population was decided by randomly selecting 100 restaurants from Brantford and 100 from Peterborough. To ensure the external validity of the experiment, we used the following steps to find these restaurants:

1. Scrape the postal codes of all restaurants located within the circle of the Brantford City Centre to a 40 km radius on Yelp. And then use the same method for Peterborough.
2. Acquire a list of postal codes in Brantford CMA and Peterborough CMA from the Postal Code Conversion File (PCCF) retrieved from the University of Toronto Library (Toronto Library, n.d.).
3. Compare the two lists and eliminate the restaurants with postal codes outside of Peterborough CMA and the Brantford CMA.

¹Ontario’s Municipal Act, 2001 defines a single-tier municipality as “a municipality, other than an upper-tier municipality, that does not form part of an upper-tier municipality for municipal purposes”

²Approach to examine the similarities of these two cities are further introduced in the discussion section

4. Randomly select 100 restaurants from Brantford and 100 restaurants from Peterborough to form the frame population.

Table 1: Sampling Results Summary

City	Survey Administered	Total Sample Collected	Telephone Survey	Online Survey
Brantford	100	45	40	5
Peterborough	100	48	41	7

We used telephone interviews and online questionnaire methods to administer the survey. The telephone interview served as the primary channel and an online survey option was provided when respondents could not or prefer not to be interviewed over the phone. As shown in the above table (Table 1), our sampled population included 45 valid responses in Brantford and 48 collected from Peterborough, among which, 5 were collected via the online survey in Brantford and 7 were collected via the online survey in Peterborough. Surveys that were not answered or have incomplete answers were treated as nonresponses and were not included in the dataset for further analysis. The surveys were administered in the following steps:

1. The phone number of the restaurants was scraped from Yelp while we determined the frame population.
2. Working from 2 pm to 4 pm, half of the survey staff called the Brantford restaurants, and the other half called the Peterborough restaurants simultaneously to avoid sampling bias. Each phone call took around 15 minutes to complete. All restaurants on the pre-determined list were reached within one week.
3. When the call was connected, the survey staff would provide a brief introduction of the survey purpose and indicate that the survey was sponsored by the Ontario government. See Appendix A for details.
4. To ensure the quality and accuracy of the data collection, the survey staff would ask if the respondent at the restaurant worked at a management-level position in the restaurant or was familiar with the restaurant’s sales performance. If the respondent answered no, the survey staff would ask the caller to pass the call to the relevant staff in the restaurant. If that staff was not available, the survey staff will schedule another call or provide the online questionnaire based on the preference identified by the respondent. Respondents who were interested in answering the questions via online questionnaires could leave their email addresses and have two weeks to complete the survey questions.
5. Respondents who were not reached by phone for the first time were called again in the following week. Restaurants that did not respond to the second call were documented as “nonresponse.”
6. To address privacy concerns and to increase the response rate, the respondents were notified before the survey that all answers were recorded anonymously. The respondents were told at the beginning of the telephone survey that they could terminate the survey anytime if they want to. The respondents were also notified before the survey that they would have a chance to win a 50-dollar gift card if they fully participated.

The survey incurred a total cost of \$10,000 CAD, which was mainly used to hire and train staff to conduct the telephone survey, collect data and administer the online survey if applicable. A small portion of the cost (\$500 CAD) was used for online survey technology support and database maintenance.

2.3 Main Survey Results

The above figure (Figure 1) shows that restaurants in Peterborough had lower rates of layoff compared to restaurants in Brantford, suggesting families in Peterborough to have experienced better financial situations and probably less stress.

From Figure 2, we notice a considerable increase in sales in Peterborough during the reopen period. This indicated that if restaurants were open, people would had used their dine-in services, regardless of potential pandemic risks. Besides, this result also corresponds with lower layoffs in Peterborough since restaurants need staff for their dine-in areas to operate.

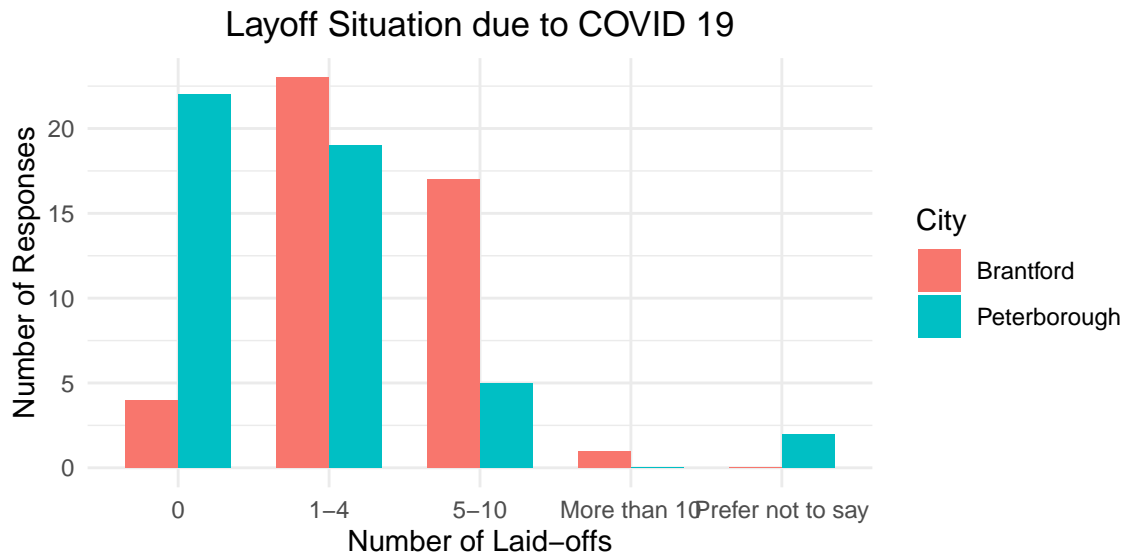


Figure 1: Layoff Situation due to COVID 19

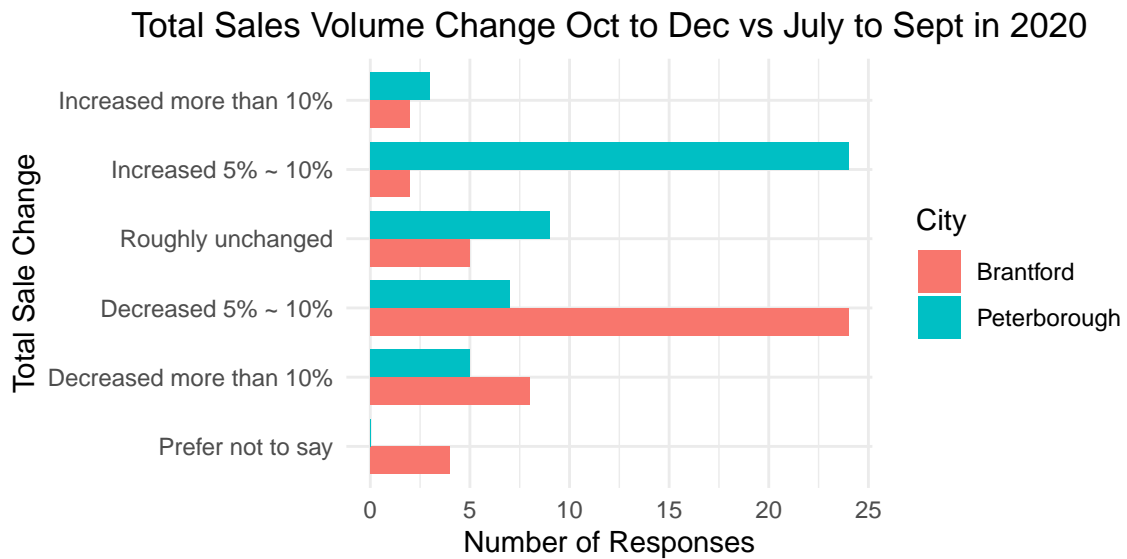


Figure 2: Total Sales Volume Change Oct to Dec vs July to Sept in 2020

In contrast, continuing shutdown restrictions during October to December on Brantford resulted in a slight decrease in sales volume for those restaurants. We propose possible reasons for the decrease in restaurant sales: (1) Residents in Brantford changed their mealing behaviors to cook more by themselves, instead of relying on meals from restaurants. (2) The continuing shutdown resulted in closures of other businesses, so these business staffs were not contributing for the restaurant sales anymore.

The increased costs of restaurants in Peterborough, as shown in Figure 3, demonstrated more activities in their restaurants. This change admits that the restaurants probably should have preserved more of their staff and consumed more utility or housekeeping materials to maintain their dine-in area. Although increased operating cost would usually impact the business unit negatively, from a broader view, these costs generate economic flow into local society and are vital for other business sectors to survive. So we consider the increased cost in restaurants during the reopening period as a good signal of economic wellbeing.

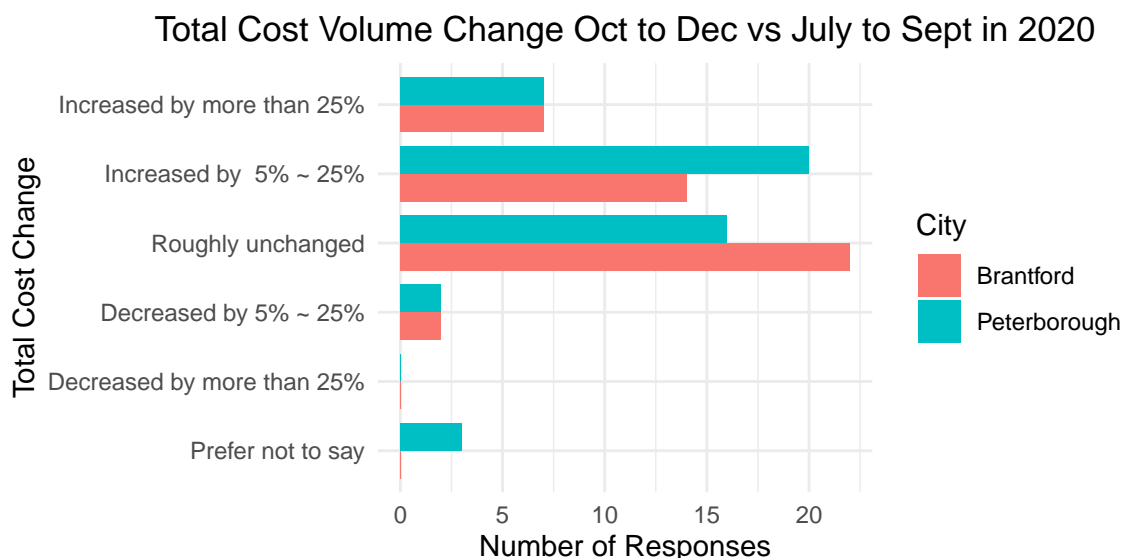


Figure 3: Total Cost Volume Change Oct to Dec vs July to Sept in 2020

The following figure (4) demonstrates restaurant owners' opinions towards the expected survivability of their businesses. It is very unfortunate that restaurants in Brantford are not as positive to continue their businesses for longer times, indicating a stressful operating situation during these continuing shutdown period. While on the other hand, restaurants in Peterborough generally expect to survive longer, showing stronger confidence to continue their businesses after reopening.

Although from Figure 4, we a pervasive gloom among the Brantford restaurants, Figure 5 illustrates that even if the pandemic ends immediately, many restaurants in Brantford, especially quick-service restaurants, have indicated that it is difficult to return to the state of operation before the COVID-19 outbreak. While for Peterborough, although some of them suspect the recovery will take more than a year to recoup with the previous situation, most of them indicated this period would be less than a year.

In addition, survey results about expected recovery time back to pre-COVID situation (Figure 5) illustrate that even if the pandemic ends immediately, most restaurants in Brantford, especially quick-service restaurants, hold negative views to recover back to pre-COVID operating situation in a short period of time. For restaurants in Peterborough, despite some suspicions to recoup with the pre-COVID situation in more than a year, most of them expected to recovery in less than a year. Therefore, we believe that the continuing shutdown in Brantford have harmed expectations of future operation possibilities in Brantford, while the reopening in Peterborough has built confidence to resolve current operation difficulties.

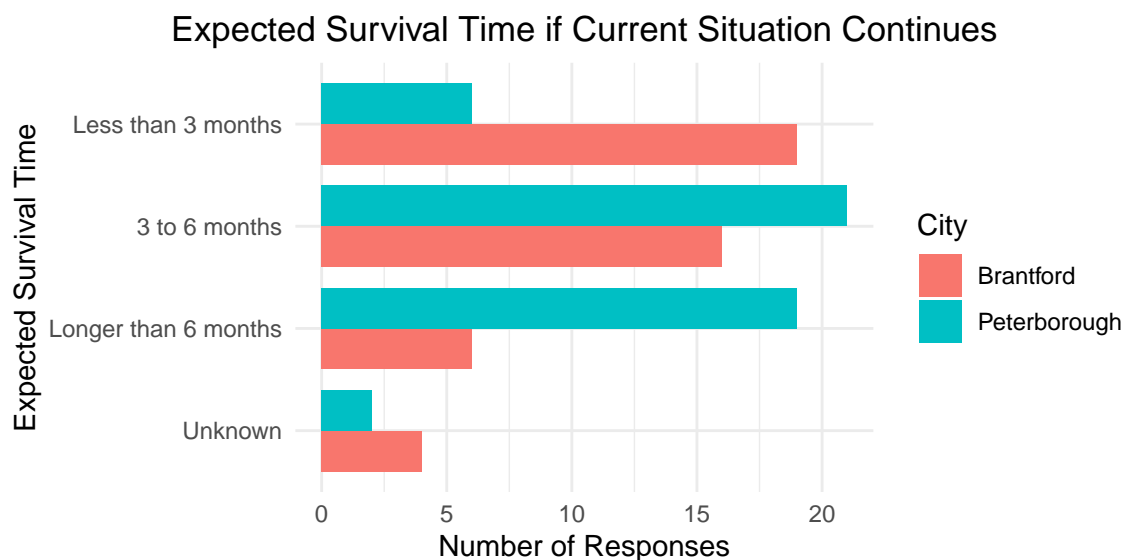


Figure 4: Expected Survival Time if Current Situation Continues

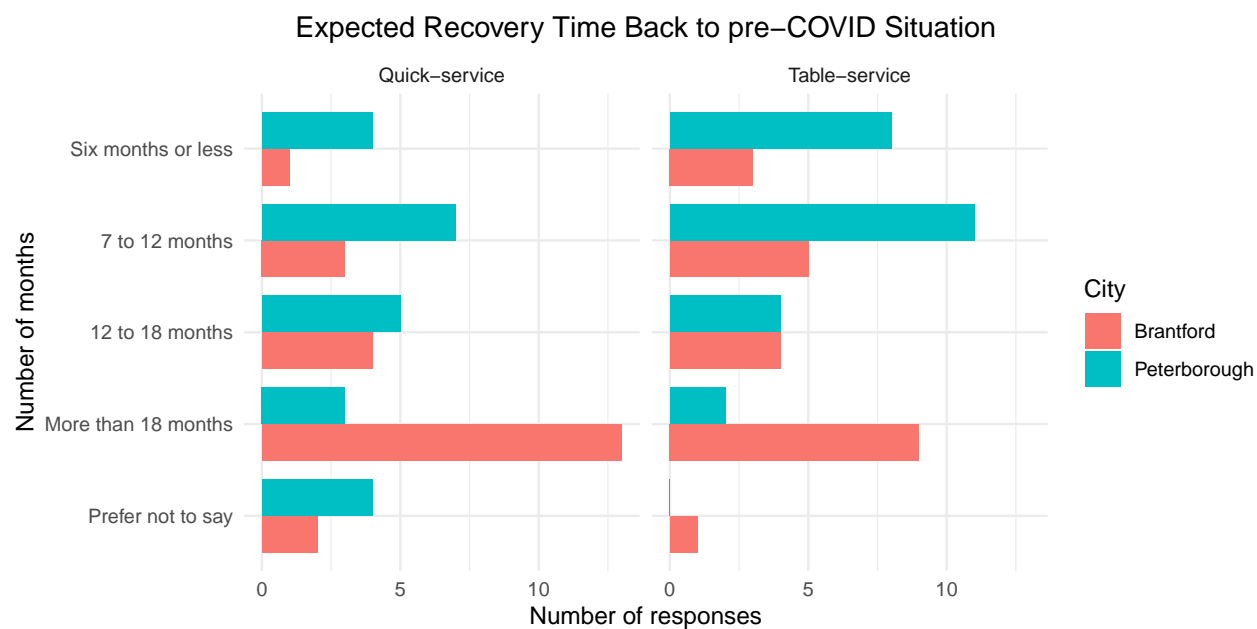


Figure 5: Expected Recovery Time Back to pre-COVID Situation

3 Discussion

3.1 Determine the Treatment Group and Control Group

To obtain an accurate estimate of the shutdown effect on restaurant businesses, average characteristics of restaurants in the reopening city and those in the shutdown city need to be identical in the absence of the reopen intervention under current COVID outbreak. Since businesses in the food service industry are highly labor intensive (Swayne 2016), the **total employment** on food service between selected cities is preferred to be equal as the identical characteristic. Besides, **population density** (**Total Population/ Total Land Area in squared kilometers**) also has significant organizational life-cycle effects(Parsa et al. 2011). At different population density levels, competitions for food services varies, leading to different restaurants mortality rates even without the reopen intervention. As a result, total employment on food service and population density serve as primary restaurant operation characteristics for the selection of treatment city and control city.

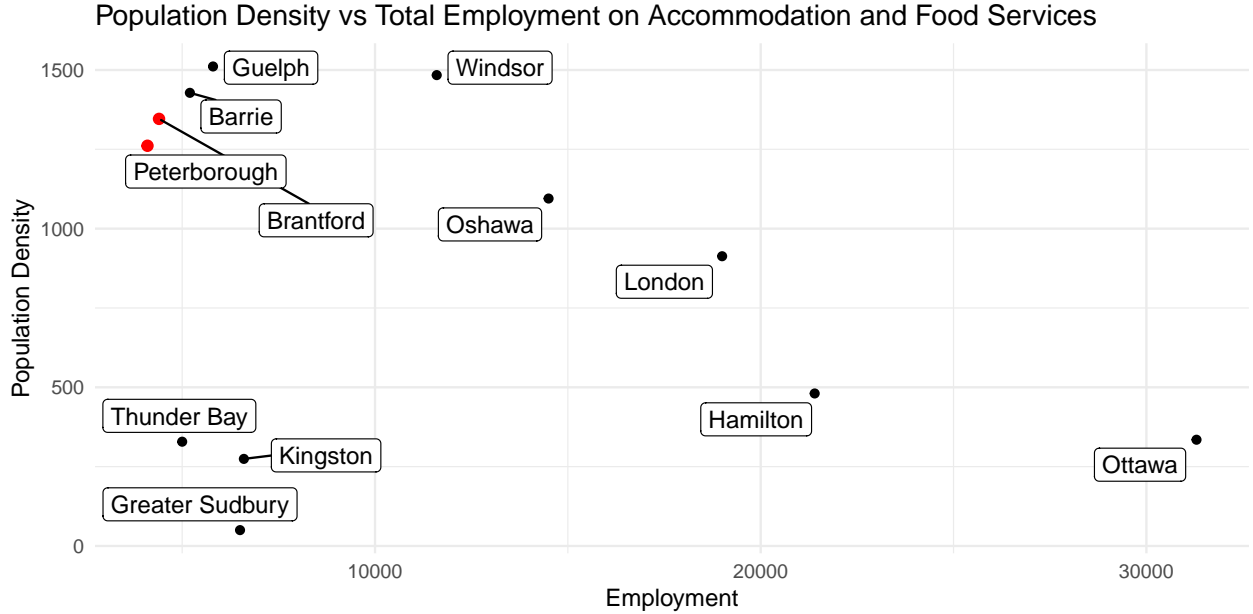


Figure 6: Population Density vs Employment on Accommodation and Food Services in Ontario Cities in 2016

We used the employment by industry data and 2016 Census data available at Statistics Canada to identify cities with similar total employment on food service and population density. The above point graph(Figure 6) indicates that Brantford and Peterborough have similar characteristics affecting the restaurant operations. In addition, the coefficient of the graph

$$\frac{\text{Population Density}}{\text{Total Employment}} = \frac{\text{Total Population/Total Land Area}}{\text{Total Employment}}$$

, which could be interpreted as the number of people served by a restaurant employee per square kilometers, helps to identify the restaurant operating situation in designated regions. Similar coefficients between Brantford and Peterborough (0.306 vs 0.308) also suggest close restaurant characteristics. Besides, there is neither significant demographics nor land areas difference between these two cities, so we consider these two cities as a valid comparison group and reopened Peterborough as the treatment group while maintaining Brantford shutdown as the control group.

Extra concerns when determining the treatment group and control group:

- The employment data at Statistics Canada uses the NAICS (North American Industry Classification System) standard and assigns employment services to Accommodation and Food Service category.

So there is less employment in food services. We took the convention that the ratio between the accommodation employment and the food service employment between Peterborough and Brantford is the same.

- Since the distance between Brantford and Peterborough is more than 200 kilometers apart, residents in Brantford are unlikely to travel such long distance solely for a dine-in meal. So the treatment of reopening Peterborough would not affect the mealing behavior in Brantford. However, residents in shutdown regions near Peterborough might go for dine-in meals, potentially increasing sales in Peterborough restaurants. The actual shutdown effect on restaurants could be overestimated due to possible increase in sales from nearby shutdown regions' residents.
- The mindful comparison between cities' similarities on employment, population density, etc. ensures the internal validity of our experiment so that we could accurately estimate the true impact of shutdown restrictions on restaurant. However, our shutdown effect evaluation may not be generalized to the entire population of interest, i.e. all restaurants in Ontario such as township regions or cosmopolitan city Toronto due to different levels of competitions, operating costs, etc.

3.2 Concerns about Sampling Method

The sampling methods of this experiment were accompanied by some inevitable limitations and biases:

- The list of restaurants in Brantford and Peterborough may not be accurately represented on Yelp. Some restaurants may not be registered on Yelp and some may not have updated their information on time. What is more, restaurants would only appear in the Yelp query when it has been reviewed by one of its users, which suggests that certain new restaurants may not be on the list. These limitations may result in the exclusion bias of our sample.
- The sample suffered from survivorship bias as we only surveyed restaurants that are still in operations. Restaurants that lost their businesses during the pandemic could not be captured with the current method. However, these may be the ones that are most severely impacted.
- The sampling methods bore self-selection bias. From a psychological standpoint, respondents may have a stronger desire to respond to the survey if they have a strong opinion to express about their situations. The results showed that restaurant owners in Brantford faced a steeper sales decrease, and we expect that this may contribute to the higher survey response rate in Brantford.
- The accuracy of the responses may be hindered by the difficulties in reaching the management staff of restaurants. The phone numbers scraped from Yelp was usually used for food ordering and the staff who picked up the phone may not know the sales status. However, we do not believe this would significantly skew the result. According to Statistics Canada, 98.5% of restaurants in Canada have 0-99 employees(Canada, n.d.c). Since food service businesses are usually small to medium size, there is a high likelihood for the survey to reach management staff in the restaurant. Respondents were also asked to pass the phone to management staff or leave their email to receive the online survey if they would like to do so, therefore mitigating the negative impact caused by the telephone survey method.
- Respondents may react differently in a phone interview compared to an online survey. The two methods may have the potential to produce significantly different results even when the two surveys have the same questions (Yan Xin 2014). People may be more comfortable answering a certain type of question online rather than by phone call, or vice versa.

3.3 Survey Results and Policy Implication

According to survey questions 3-17 in section 2, Peterborough restaurants indicated to be more cheerful to carry on with their businesses in future. They found the COVID-19 situation remediable, demonstrated the desire to further invest in their career, and revealed to be an overall happier society compared to Brantford restaurant. As Dr. Ed Diener, a professor of psychology at the University of Virginia and the University of Utah, and a senior scientist for the Gallup Organization stated in his interview with Sherif Arafa(https://greatergood.berkeley.edu/article/item/why_governments_should_care_more_about_happiness),

“The deep and long-lasting sources of happiness contribute to what we call sustainable happiness, which is lasting, not just momentary.” He continues “we find that sustainable happiness leads to: · Better health and longevity: Happy people live longer and experience better health. · Superior work performance, especially organizational citizenship. · More supportive social relationships—for example, being less likely to get divorced. · Better citizenship and more “prosocial” behaviors—for example, being more likely to help others, volunteer, or donate money to charity. · Better mental health and resilience when confronted by stressful events—for example, being less likely to suffer from mental health problems such as depression, and more likely to bounce back after something bad happens. The benefits of sustainable happiness are broad and important. They cannot be ignored. To repeat: Happy people do not just feel better, but they function better in achieving the things we value. They help society. They help those around them to also lead high-quality lives. Happy people are not uncaring, selfish people. They have the energy and desire to work on societal problems as much as or more than others”. According to our finding in the above survey results, we believe reopening of the restaurants in Peterborough has resulted in “sustainable happiness” among restaurant owners in this city. Further to that, we didn’t find a substantial reason to not generalize these results to other similar businesses who need to provide physical areas to serve their clients respectively. Adhering to strict preventing regulations, this would include professional services like clinical treatments, open area sports and other applicable safe businesses. We also argue that the resulted happiness, which was proactively forethought and managed by the Government of Canada by offering supportive programs such as Canada Emergency Wage Subsidy (CEWS), Canada Emergency Loan Subsidy (CELS), business grants and low interest loans, will not only decrease the rates of depression, suicide, frustration, crime, and other unprecedented social issues among this society, it will definitely leave a sense of trust, confidence and faith among the adolescence who usually start their career with a part-time student work in restaurants. According to (<https://www.sciencedaily.com/releases/2011/08/110822091859.htm>), “the relative intensity of these emotions (happiness and depression among adolescents) is also important. The odds of drug use were notably lower for youth who reported that they were more often happy than depressed and were substantially higher for those who indicated that they were more depressed than happy.” To this point, we strongly believe that the value of our understudy treatment “the reopening restaurants in Peterborough” has been realized and will continue in future.

On the other hand, the result of covid cases (((((reference??)))))) revealed a new safety related concern. The higher rate of Corona incidents, fear and mortality among Peterborough people, compared to the residents of Brantford, take us to the emergence of a new argument, “how do you find the overall happiness among people in a city, not solely among the restaurant owners?” Undoubtedly, more CORONA related cases fold up happiness and spread depression among society, which literally criticises the beneficial effects of above mentioned governmental supportive programs.

Do we believe in absolute “safety first?” If we do, no doubt about keeping restaurants, and probably all other similar business activities, closed until the pandemic ends. And, the government should invest in other programs to insert hope, administer happiness and hinder the spread of depression. However, a controversial discussion would be “should considerate people pay for the negligence of defiant citizens who parade time to time at Yonge and Bloor streets in Toronto (in front of my apartment) to criticize wearing masks?” Not good enough, some suspect the Corona vaccine contains microchips or 3D-camera to spy and scan their body for intelligent services!

The goal of this paper is to report the dynamics of an intervention and to analyze how the results of a treatment - reopening the restaurants - would happen if in place. We observe a trade-off between the prosperity and hopefulness among the businesses in one city versus the lower number of COVID cases throughout the other city. We believe this would be a controversial discussion between citizens, activists and the government. At this situation, we recommend the “Soft System Methodology” (SSM) which “uses “systems thinking” in a cycle of action research, learning and reflection to help understand the various perceptions that exist in the minds of the different people involved in (one) situation” (http://www.construction-innovation.info/images/pdfs/Research_library/ResearchLibraryA/Refereed_Conference_papers/Five_Case_Studies.pdf). SSM contributes to better knowledge management, leading to better understanding of different existing viewpoints and also insights to different perspectives of communities. Gathering more information and context knowledge would more or less result in taking the most desired and applicable

approach to enforce decisions and to better respond to the citizen's needs.

Appendix

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