Twitter followers of Canadian political and health authorities during the COVID-19 pandemic: What are their activity and interests?

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Abstract

I examined the use of Twitter during the COVID-19 pandemic to find out how many Twitter users started to follow relevant Canadian political and health authorities, and I investigated the followers’ activity. To this end, I analyzed 398,037 Twitter accounts. The results reveal that the Twitter accounts of relevant authorities gained a significant number of new Twitter followers during the pandemic. Moreover, the newly joined Twitter users were rather passive; they tweeted and liked fewer tweets than Twitter users who registered in the months prior to the pandemic. Also, they chose to follow predominantly Twitter accounts related to news, politics, and governmental agencies. These findings suggest that during the pandemic, numerous information-seeking citizens joined Twitter for the purpose of obtaining information about public health matters. This suggests that authorities should incorporate Twitter among their information dissemination tools, especially during emergencies, to meet the public demand for information.
Introduction

The 2019 novel coronavirus disease (COVID-19) has significantly affected the lives of people across the world, and Canada has been no exception. Government officials charged with taking measures to prevent the spread of COVID-19 had several options on how to inform the public about decisions that were being made and steps that were being implemented. They could use traditional media, such as television, radio or print, but they had also an option newer forms like social media. Social media is an ideal tool to offer swift information about the state of the country at times when it is crucial to swiftly provide correct information to citizens in times of crisis. One of the social networking services quite popular in Canada is Twitter. At the beginning of 2020, almost seven million Canadians were registered on Twitter (Statista, 2020). For this study, I analyzed the Twitter activity of users who interacted with Canadian authorities on Twitter during the COVID-19 pandemic. Analysis of these interactions is important as there is evidence (Bol et al., 2020) that the COVID-19 pandemic had an impact on government support. The Canadian political science community wasted no time and began to analyze the COVID-19 pandemic, and a number of excellent studies have been published (Sevi et al., 2020; Malloy, 2020; Pickup et al., 2020; Miller, 2020a, 2020b; van der Linden and Savoie, 2020; Motta et al., 2020). All of these studies have emphasized the importance of the COVID-19 pandemic on the Canadian political system and society. This paper contributes to this collection.

The literature on the uses of social media during crisis events and disasters clearly shows that governments and their agencies provide information via social media that should facilitate managing crises. The literature is extensive and deals with natural disasters, crisis events and emergencies (Zhang et al., 2019; Tang et al., 2015; Alexander, 2014; Procter et al., 2013;
Kavanaugh et al., 2012; Graham et al., 2015). One could assume that governments and their agencies should behave similarly during the COVID-19 pandemic.

In recent years, there has been increased interest in research on political communication via Twitter (Jungherr, 2015, 2016; Dang-Xuan et al., 2013; Enli and Skogerbo, 2013). Numerous studies on Twitter and user activity during the COVID-19 pandemic have been published. It is possible to identify three research themes emerging from these studies. The first research theme is the importance of usage of Twitter by politicians, state leaders and public authorities during the COVID-19 pandemic. Grossman et al. (2020) show the importance of U.S. governors’ recommendations for residents to stay at home. These recommendations significantly reduced the mobility of individuals during the pandemic. Rufai and Bunce (2020) analyze G7 world leaders’ usage of Twitter during the COVID-19 pandemic. They suggest that Twitter can be used as a platform for rapid communication on public health matters with citizens. Generally, many world leaders have already adopted Twitter as a platform for communication with citizens (Barberá and Zeitzoff, 2018). Furthermore, in Canada, Teichmann et al. (2020) show the importance of Canada’s local and provincial authorities during the COVID-19 crisis.

The second research theme is political polarization on Twitter. In Canada, Merkley et al. (2020) show that the political elites and the public are in the period of cross-partisan consensus on very important issues (such as social distancing) during the COVID-19 pandemic. Therefore, unlike in the United States, where tweets are characterized by strong political polarization (Jiang et al., 2020). The third research theme is spreading misinformation about COVID-19 on Twitter (Pérez-Dasilva et al, 2020; Rodríguez et al. 2020). In Canada, Bridgman and et al. (2020) find a link between misinformation disseminating on social media and behaviours and attitudes that complicate managing the COVID-19 pandemic. Pulido et al. (2020) show that even though false information about the
pandemic is tweeted more, it is less retweeted than science-based tweets. The spread of misinformation is very dangerous in times of crisis, as it can lead to citizens not complying with state regulations and following experts. Several factors affect whether a citizen will be willing to listen to experts. In Canada, Merkley et al. (2020) emphasize the role of anti-intellectualism in the COVID-19 pandemic as an important factor in shaping COVID-19 information in their study based on survey experiments.

The research themes mentioned above are relevant to the points made in this paper. This paper attempts to fill gaps in the research themes. For example, the mentioned studies have not examined the impact of the COVID-19 pandemic on the Twitter user base with the respect to the growth of Twitter users following the Twitter accounts of relevant authorities nor the behaviour and activity of new Twitter users during the pandemic. It is important to investigate this because it highlights whether and how much it is important to use social media during times of crisis. It also examines how much potential Twitter has as an information tool for users that do not necessarily consider social media as a typical platform for their entertainment or active communication, but who are, instead, interested in using it to obtain information in times of emergency. The points in the article are especially important for the third research theme that deals with spreading misinformation as this study provides a counterpoint to this literature on whether it is possible to see Twitter as an important and legitimate source of information by analyzing Twitter users and their activity on relevant accounts of political actors and health authorities.

There are several motives behind Twitter use. Parmelee and Bichard (2012) mention several motives that apply to Twitter: convenience, entertainment, self-expression, guidance, information-seeking and social utility. People who are interested in getting information about COVID-19 have several of these motives; it is a convenient way to quickly obtain information from relevant authorities, and this information can guide the followers’ decisions like whether
and when it is necessary to wear a face mask. By obtaining information via Twitter, followers are informed about government actions and able to express their opinions and vocally critique their perception of government activities. Information obtained via Twitter has a social utility that assists followers in their social interaction with friends and family. Numerous studies have concluded that some users use Twitter primarily as an information-seeking platform (Hughes et al., 2012; Johnson and Yang, 2009).

I have divided this paper into several sections. In the first section, I detail the data collection process. This section must be provided to the reader to understand the data collection procedure. In the second section, I present the content of tweets from analyzed Twitter accounts via word clouds to examine the communication of officials about COVID-19. In the third section, I offer the results of the analysis regarding the growth of Twitter followers. In this analysis, I identify the state of followers before and during the COVID-19 pandemic. In this section, I show the effect of the COVID-19 pandemic on the growth of Twitter followers. In the last three sections, I follow on from the results of the previous sections and present findings on users that newly joined Twitter regarding their activity and interests in order to understand their behaviour on Twitter.

**Data Collection**

For my analysis, I focused on the Canadian government and its officials and agencies. Initially, I collected tweets by Prime Minister Justin Trudeau (@JustinTrudeau) to generate word clouds and basic information about his followers. Next, I gathered detailed information about the Twitter followers of Health Canada and the Public Health Agency of Canada (PHAC). Health Canada and the PHAC have a joint Twitter account, @GovCanHealth. While Trudeau as a leading Canadian politician is charged with informing the public in general terms, as a governmental department and agency responsible for crafting federal public health
policy, Health Canada and the PHAC are responsible for publishing updates and timely information about the COVID-19 pandemic for the public. I then analyzed two other Twitter accounts related to the government and public health that were significantly active during the COVID-19 pandemic, the Twitter account of Patty Hajdu, the Minister of Health (@PattyHajdu) and the Twitter account of the Chief Public Health Officer and head of the PHAC Canada Theresa Tam (@CPHO_Canada). I collected data through Twitter API from June 15 to June 20, 2020. More details are given below for each figure, and the summary of data is in Table 1 in the Appendix. However, for more detailed analysis, I also collected data on the Canadian Space Agency (@csa_asc) and Environment Climate Change Canada (@environmentca).

**Word clouds**

Figure 1 shows two word clouds based on tweets from @JustinTrudeau. Word clouds are one of the simplest ways to visualize the content of tweets during a specific period. On January 26, 2020, Trudeau first tweeted about COVID-19 by retweeting a tweet by Tam (@CPHO_Canada). The word clouds in Fig. 1 show the most often words tweeted by @JustinTrudeau from January 26 to June 15, 2020. It is important to note that Trudeau posts the same information in separate English and French tweets. Fortunately, Twitter API offers information about the language of tweets. Therefore, I created a separate word cloud for each language.

I excluded stop words from each tweet by using R package stopwords (Benoit et al., 2020) and used snowball as the source of stop words. As I continued processing tweets, I deleted numbers and converted words to lowercase for consistency. The generated word clouds clearly show that COVID was the most frequently used word within English tweets during the examined period and the second most frequently used word in the French tweets (behind the
general French adverb *plus*). Other frequently used words found in Trudeau’s tweets were those connected with morale-boosting related to the COVID-19 pandemic. In English, those words included Canada, Canadians, Canadian or country to underscore the importance of uniting as a nation; other words such as help, support, keep, together and protect emphasize the need for cooperation and encourage citizens to consider others. For comparison reasons, two word clouds based on Tweets that precedes the COVID-19 pandemic are presented above in Figure 1. It is possible to see that some words such as Canada, Canadians, Trudeau used also often. However, words such as support, help, need were used more during the COVID-19 pandemic.

October 25, 2019 until February 25, 2020

February 26, 2020 until June 15, 2020

Fig 1. @JustinTrudeau word clouds
In addition to word clouds, Figure 2 shows the number of tweets per week with COVID-19 keywords (“coronavirus” and “covid”) from all four analyzed accounts. For this part, I included only original tweets as these accounts often retweet tweets to each other. This figure illustrates the over-time dynamics of using Twitter in Canadian government communication. The government has started informing the public since the later part of January as more news started coming from China and the world about the significance of coronavirus. Also, on January 27, 2020, Canada had their first confirmed coronavirus case that was an individual returning from China (CTV News 2020). However, on March 5, 2020, the first case of COVID-19 community transmission in Canada was confirmed (Slaughter 2020). In March, the number of infected started to grow which led to more information from the government. It is possible to see the spike in mid-March. After the spike, the level of information coming from the government was relatively constant.
The growth of Twitter followers

Information-seeking citizens would be expected to follow Twitter accounts providing information about the COVID-19 pandemic if they are interested in COVID-19 updates. Figure 3 visually demonstrates the growth of followers in four separate graphs. Each graph shows the number of Twitter followers gained by @JustinTrudeau, @GovCanHealth and @PattyHajdu from June 3, 2019 to June 8, 2020, and @CPHO_Canada from February 10 to June 8, 2020. Unfortunately, Twitter API does not offer information about the growth of followers. Therefore, I gathered these data continuously from June 2019 to June 2020. Also, I do not have data on @CPHO_Canada followers before February 2020. From each graph, it is possible to compare the pre-pandemic period to a period during the COVID-19 pandemic. As it is mentioned above, on March 5, 2020 (green line in figures), the first case of COVID-19 community transmission in Canada was confirmed (Slaughter 2020). Therefore, since that date, it is reasonable to expect increased interest in information on COVID-19 from the public. The graphs in Figure 3 confirm this expectation, showing a sharp increase in followers among all four accounts. For better illustration, the number of cumulative COVID-19 cases and deaths in Canada is provided for three weeks. The source of data was the Johns Hopkins University School of Medicine (2020). The sharpest increase appears approximately two weeks after the first case of community transmission. In one week, from March 16 until 23, 2020, @JustinTrudeau gained more than 70,000 followers, @GovCanHealth gained almost 25,000 followers, @CPHO_Canada gained more than 40,000 followers, and @PattyHajdu gained more than 8,000 followers. The annotation of weeks gives the dates of March 16 to March 23 rather than March 16 to March 22 because the collection of the number of followers was done over the course of every Monday.

All Twitter follower gains are significant, but their significance differs because of the total number of followers. Prior to the pandemic, Trudeau’s Twitter account had a far greater
number of followers than the other accounts, it is not unexpected that he would see a correspondingly large increase. As of June 8, 2020, @JustinTrudeau had more than five million followers, @GovCanHealth had over 321,000 followers, Tam had over 201,000 followers, and Hajdu had over 60,000 followers.

However, the significant gains in the number of followers for the analyzed accounts could correspondent to the general trend during the COVID-19 pandemic. Under conditions of anxiety and crisis, people consume overall more information (Gadarian and Albertson, 2014). Therefore, there has been a general increase in information consumption during the COVID-19 pandemic (Casero-Ripolles, 2020). As a placebo test, I plotted the accounts of other departments/agencies to see the difference. I chose the Canadian Space Agency (@csa_asc) and Environment and Climate Change Canada (@environmentca) as they are highly followed on Twitter and not directly related to the COVID-19 pandemic. At the beginning of June 2019, both accounts had a larger following than @GovCanHealth (almost 230,000 followers), @csa_asc had over 260,000 followers while @environmentca had over 360,000 followers. Figure 4 shows that @csa_asc and @environmentca usually gained slightly more followers than @GovCanHealth in the preceding weeks and months of the COVID-19 pandemic. In mid-March, there was no spike for @csa_asc and @environmentca as there was for @GovCanHealth. Therefore, Twitter accounts related to the COVID-19 pandemic gained a significant number of followers while these two did not.
Fig. 3. Number of followers gained for each Twitter account
New Twitter users

The finding on the number of followers is only one part of the investigation; it remains to determine how many Twitter followers created new accounts for the purpose of following COVID-19 updates versus the followers who already had accounts. To answer this question, Figure 5 shows the percentage of followers that created a Twitter account each week. Twitter API allows to collect followers of each account and offers information about when accounts were created. I looked at all Twitter followers from four analyzed accounts on June 20, 2020, and I gathered information about them. By this method, I had information about all Twitter followers and when they created their accounts. Therefore, I could split followers into weeks when they created accounts. However, I calculated the percentage only from followers that created accounts from April 29, 2019 to May 31, 2020. The sum of percentage values from each week is shown on the x-axis and equals 100 per cent. The total number of follower accounts that I analyzed included 330,715 for @JustinTrudeau, 25,459 in the case of @GovCanHealth, 32,828 in the case of @CPho_Canada, and 9,035 in the case of @PattyHajdu. Accounts created during the COVID-19 pandemic are, for all analyzed accounts, significantly overrepresented. Twitter followers that created accounts between March 16 and 22, 2020 compose more than 10 per cent of all analyzed accounts following Health Canada and the PHAC, Tam and Hajdu. In the case of Trudeau, the week of March 16 to 22, 2020, has the largest proportion of created accounts, reaching almost 5 per cent, but it is a smaller percentage when compared to other accounts. The cause of this may be the fact that Trudeau had already a much larger following, and he is not as specifically connected to health care topics as the other three Twitter accounts. Therefore, while Twitter accounts that were
created in the pre-pandemic period make up around 1.5 per cent or less of analyzed Twitter followers, Twitter accounts created during March and April of 2020 make up significantly more. This implies that the growth of Twitter followers during the COVID-19 pandemic, as described above, is associated with the fact that many of the newly gained followers were from newly created Twitter accounts. Therefore, people created new accounts and started using Twitter during the COVID-19 pandemic to receive information from relevant authorities.

![Graph showing Twitter followers that created an account in a given week](image)

**Fig. 5. Twitter followers that created an account in a given week**

**User activity of new Twitter users**

Users that joined Twitter during the COVID-19 pandemic could be expected to have different behaviour on Twitter as primarily information-seeking users less interested in social
interaction; this assumption is based on the fact they were not sufficiently interested in Twitter before the COVID-19 pandemic to create an account. The analysis of user activity for this study was based on the followers of @GovCanHealth as it is a Twitter account with the largest number of followers strictly related to the Canadian public health system. Figure 6 shows the median of tweets per month for accounts created each week. For each Twitter account/follower, I divided the total number of Tweets by the number of days from the creation of an account to calculate the average number of tweets per day since the Twitter account was created, and I multiplied by 30 to receive a number corresponding to one month. Each week is reported separately to account for possible different activity rates depending on how long a user has been active on Twitter. This is also why I included only Twitter accounts created from April 29, 2019, to April 26, 2020, and I excluded accounts created recently as one might argue that they had a little time to get acquainted with Twitter. The total number of examined accounts was 23,669. Figure 6 shows that for accounts created before the COVID-19 pandemic, the median of tweets per month ranged from 0.5 to 2.5. This finding corresponds with the research on Twitter activity in the United States by Pew Research Center (Hughes and Wojcik, 2019) that found out that the median number of tweets per month is 2 in the United States. This number is quite low as Pew Research Center found that 10 per cent of users, that tweeted the most, created 80 per cent of the total tweets.

Twitter users that created accounts a few days before and after COVID-19 was declared a pandemic by the World Health Organization (WHO), on March 11, 2020, have significantly fewer tweets per month. For @GovCanHealth followers that created accounts in the week of March 9, 2020, and several of the following weeks, the median of tweets is around 0.25. This suggests that users who created a Twitter account during the pandemic period used Twitter mainly as an information source rather than as a platform for sending tweets. Twitter users can like tweets, and it is one of the forms of account interaction. I applied the same process
described above for liked or favourite tweets. Figure 7 shows a median of liked tweets per month for accounts created each week following @GovCanHealth. The like/favourite results are very similar to the number of tweets. Accounts created before the COVID-19 pandemic have the median of liked/favourite tweets ranging from 2 to 8 depending on the week, while for accounts created during the COVID-19 pandemic, the median of liked/favourite tweets drops to just 1. This implies that @GovCanHealth followers who joined Twitter during the COVID-19 pandemic have significantly different behaviour on Twitter. The limitation of this finding is that it is not possible to find out how many times newly joined Twitter users watch their feed or whether they connect after registration on Twitter at all. Therefore, it is not possible to determine whether passive behaviour was different.

Fig. 6. Median of tweets per month for accounts created each week among @GovCanHealth followers
To further examine users that joined Twitter during the spread of COVID-19, I collected data on the followers of @GovCanHealth and examined what other accounts they follow to look for common interests. I analyzed only the accounts that were created in March and April 2020. It was only possible to analyze accounts that were not set to private. The total number of examined accounts was 10,698. If, as hypothesized, these new Twitter users are primarily information-seeking citizens interested in information about the COVID-19 situation, then they should follow accounts that are likely to provide them with this information. I classified all Twitter accounts that were followed by at least 10 per cent of followers of @GovCanHealth into four categories: celebrities, governmental, news and politics. Governmental accounts are not necessarily connected with the Canadian government as I, for example, included @WHO and @CDCgov as governmental accounts. A total of 54 Twitter
accounts were followed by more than 10 per cent of followers of @GovCanHealth. The hypothesized assumption was that newly joined Twitter users would be most interested in news, politics and governmental Twitter accounts rather than celebrities as celebrities offer different kinds of information than relevant authorities. However, of course, they can also tweet about COVID-19. Figure 8 is a bar plot that shows the percentage of each account category. All 54 Twitter accounts with detailed information can be found in Table 2 of the Appendix. New followers of @GovCanHealth followed Trudeau’s account the most (57 per cent) and 46 per cent of those following @GovCanHealth also followed @CPHO_Canada. From all 54 Twitter accounts, only four celebrities were followed by more than 10 percent of the followers of @GovCanHealth; all other followed accounts were governmental, news or politics and news was the dominant category. This indicates that these newly joined Twitter users in March and April 2020, were primarily information-seeking users and interested in following updates about the COVID-19 pandemic.

However, it must be emphasized that these findings do not implicate that users that joined Twitter during the COVID-19 pandemic are significantly different than other Twitter users in their interests. In comparison to all Canadian Twitter users, it can be expected that @GovCanHealth followers are always skewed toward news-oriented Twitter accounts regardless of whether they joined Twitter during or before the COVID-19 pandemic. Therefore, these findings can not help us with the answer to what newly joined users on Twitter during the COVID-19 pandemic, not just followers of @GovCanHealth, are interested in and whether their preferences are systematically different across the board.
Discussion

The findings in this research suggest that Twitter has served as an information source for many during the COVID-19 pandemic. Several observations support this claim. First, a significant increase in people following the Twitter accounts of relevant authorities, Trudeau, Tam, Hajdu, and Health Canada and the PHAC, during the COVID-19 pandemic was noticed. Second, for all four accounts, the number of followers that created accounts at the beginning of the COVID-19 pandemic and in the following weeks is significantly overrepresented when compared to the pre-pandemic months. This means that during that period, a significant portion of new followers was using new Twitter accounts. Therefore, though many people were using Twitter before the COVID-19 pandemic, a significant number decided to join at this time. Third, I analyzed the followers of @GovCanHealth and followers that created an account during the COVID-19 pandemic had significantly different behaviour to users that joined Twitter before the COVID-19 pandemic; these new users posted fewer tweets and liked...
fewer tweets. This suggests that new users are more passive and interested in obtaining information rather than interaction. Fourth, I analyzed what other accounts followers of @GovCanHealth follow and determined that they were mainly drawn to Twitter accounts related to news, politics and governmental agencies and, to a much lesser degree, celebrities. This suggests that these new users turned to Twitter primarily as information-seekers rather than seeking entertainment. All findings suggest that, even in countries such as Canada where Twitter is highly popular, there is still room for growth. When people who do not normally use Twitter use it to seek information during a crisis, politicians and state agencies should recognize this behaviour and use social media as one of the platforms for spreading news and information. Also, this paper provides a counterpoint to the literature that emphasizes social media as a platform for spreading misinformation during the COVID-19 pandemic. Legitimate relevant authorities can provide legitimate information to citizens via social media, and the findings show that many citizens are indeed interested in this news.

It is important to note that Twitter is used by a minority of people in Canada. Twitter is still not the dominant source of news information. Only 16 per cent of the Canadian public uses Twitter as a source for political news. The dominant mode of news consumption in Canada is still television (Owen et al., 2020). Therefore, the statements of the relevant authorities from the television screens will reach a larger audience. The findings of this study must be considered in this context.

One of the limitations of the study is that it was not possible to determine that newly gained followers are Canadians and legitimate accounts. However, the same applies to the pre-pandemic months. At the moment, there is no reason to assume that the number of fake accounts should be significantly greater during the COVID-19 pandemic than before. The more detailed analysis of @GovCanHealth followers did not indicate this possibility. Further
research could continue in the analysis of Twitter accounts of federal and provincial political actors and authorities in different directions as the pandemic continues.

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