

Homeless population trends from 2020 to 2021*

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Abstract

Making the experience of homelessness rare and temporary in Toronto has long been a government effort. We used shelter system flow data from 2020 to 2021 to estimate changes in the number the homeless population in Toronto. We find that the number of people experiencing homelessness is increasing dramatically from 2020 to 2021.

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*Code and data are available at: <https://github.com/zihanjasmine/Toronto-shelter-flow>.

1 Introduction

The government takes extraordinary steps to eliminate homelessness. In the longer term, 150 modular support homes will be built for houseless people (City of Toronto, 2020). In the short term, homeless people can live in shelters, which provide food, beds, and mental health support. Reasons for homelessness include unemployment, poverty, inflation, etc. The COVID-19 pandemic may exacerbate the impact of these factors on the number of homeless people. The Toronto shelter system flow data from the City of Toronto Open Data Portal can tell us whether the government’s goal of reducing homelessness has been achieved.

In this report, I will analyze how the number of people using the Toronto shelter system changes in Toronto from 2020 to 2021. Moreover, I will discuss biases in the data and the underlying implications it might cause.

All analysis was done with an open-source statistical programming language R (R Core Team 2020).

2 Data

2.1 Data source

This paper utilizes data collected from Toronto shelter sites that use the Shelter Management Information System (SMIS). SMIS allows staff to accommodate homeless people more efficiently, greatly reducing the time staff spend dealing with paperwork.

Toronto shelter system flow data were obtained from the City of Toronto Open Data Portal, using the R package: `opendatatatoronto` (Gelfand 2020). This dataset provides an overview of the shelter’s intake of homeless people every month from 2020 to 2021. The data is ranked as silver due to its high quality. It refreshes monthly and is last refreshed on Jan 7, 2022.

All analysis was done with an open-source statistical programming language R (R Core Team 2020).

2.2 Data Characteristics

The Toronto shelter system flow data contains information about monthly inflow and outflow of people from 2020 to 2021. Descriptive characteristics such as gender and age group are also included.

Then show an extract of the dataset (Table 1). From the table, we can see that most of the homeless are young adults and middle-aged people. The aged population and youths only account for a small portion.

The new variable “inflow” represents the intake of people experiencing homelessness this month, which is the sum of individuals who enters shelter for the first time, individuals who didn’t use the shelter for three months and returns to the shelter, and people who moved to permanent housing and returns to shelter this month. We also created “outflow”, which is the sum of individuals who moves to permanent housing and people who haven’t used the shelter for three months. Then we use “inflow” minus “outflow” and get a monthly net change of Toronto shelters. The line graph was done using the R package: `ggplot2` (Wickham 2016). It shows how the net change in the number of people experiencing homelessness each month.

From figure 1, we can see that The net change in vagabonds reached its lowest point in April, then rapidly increased to a peak in July. After July, the net change in vagabonds generally showed a downward trend, although there were some fluctuations. To be more specific, the number of people leaving the shelters in the first half of 2020 is greater than the number of people entering the shelters, while in the second half of 2020, it was completely the opposite. In 2021, the net change in shelter numbers increased significantly, reaching its peak in June and then slowly declining. Overall, the number of people entering shelters in 2021 has been greater than the number leaving.

From figure 2, we can see that in 2020, the number of people actively experiencing homelessness greatly decreases from January to June and fluctuates around 7500. In 2021, the number of people actively experiencing homelessness drops slightly from January to May and increases from 7600 in May to 9200 in December.

Table 1: shelter flow

Date	Youth	Working age			Aged
	age under 16	age 16-24	age 25-44	age45-64	age 65 over
Jan-20	1440	1227	3893	2852	504
Jan-21	619	892	3165	2607	546
Feb-20	1434	1185	3909	2795	511
Feb-21	609	884	3226	2599	553
Mar-20	1380	1135	3854	2805	506
Mar-21	584	863	3186	2573	539
Apr-20	1234	1050	3518	2644	489
Apr-21	573	906	3010	2499	528
May-20	1093	964	3151	2523	476
May-21	569	901	3083	2492	530
Jun-20	993	889	2939	2381	466
Jun-21	618	979	3295	2594	551
Jul-20	911	878	2962	2331	470
Jul-21	673	972	3430	2682	565
Aug-20	879	891	3011	2336	463
Aug-21	701	972	3524	2701	581
Sep-20	806	895	2988	2390	493
Sep-21	787	1011	3588	2781	593
Oct-20	764	891	2904	2429	518
Oct-21	847	1052	3665	2833	595
Nov-20	710	889	3001	2482	504
Nov-21	849	1060	3753	2921	616
Dec-20	661	887	3090	2566	537
Dec-21	901	1054	3733	2930	637

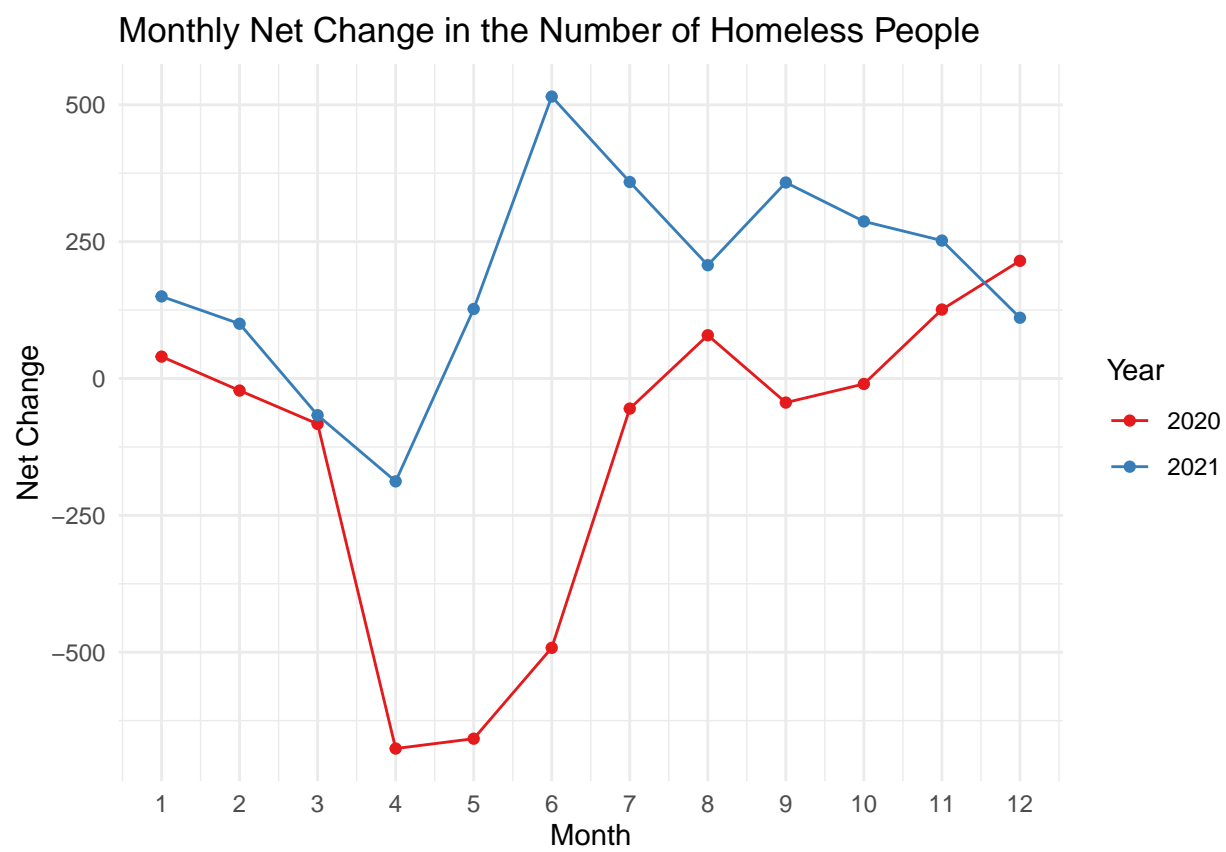


Figure 1: Monthly net change from 2020 to 2021

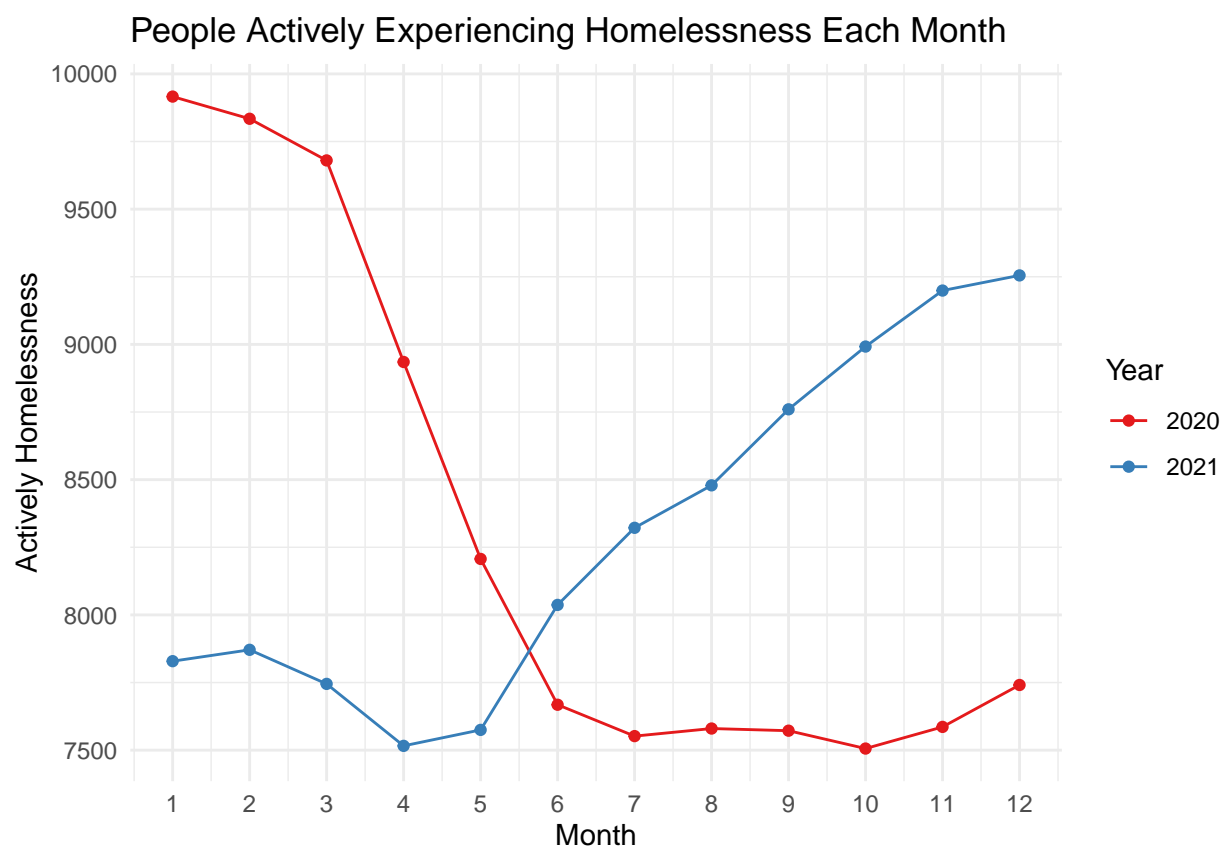


Figure 2: People actively experiencing homelessness in Toronto each month

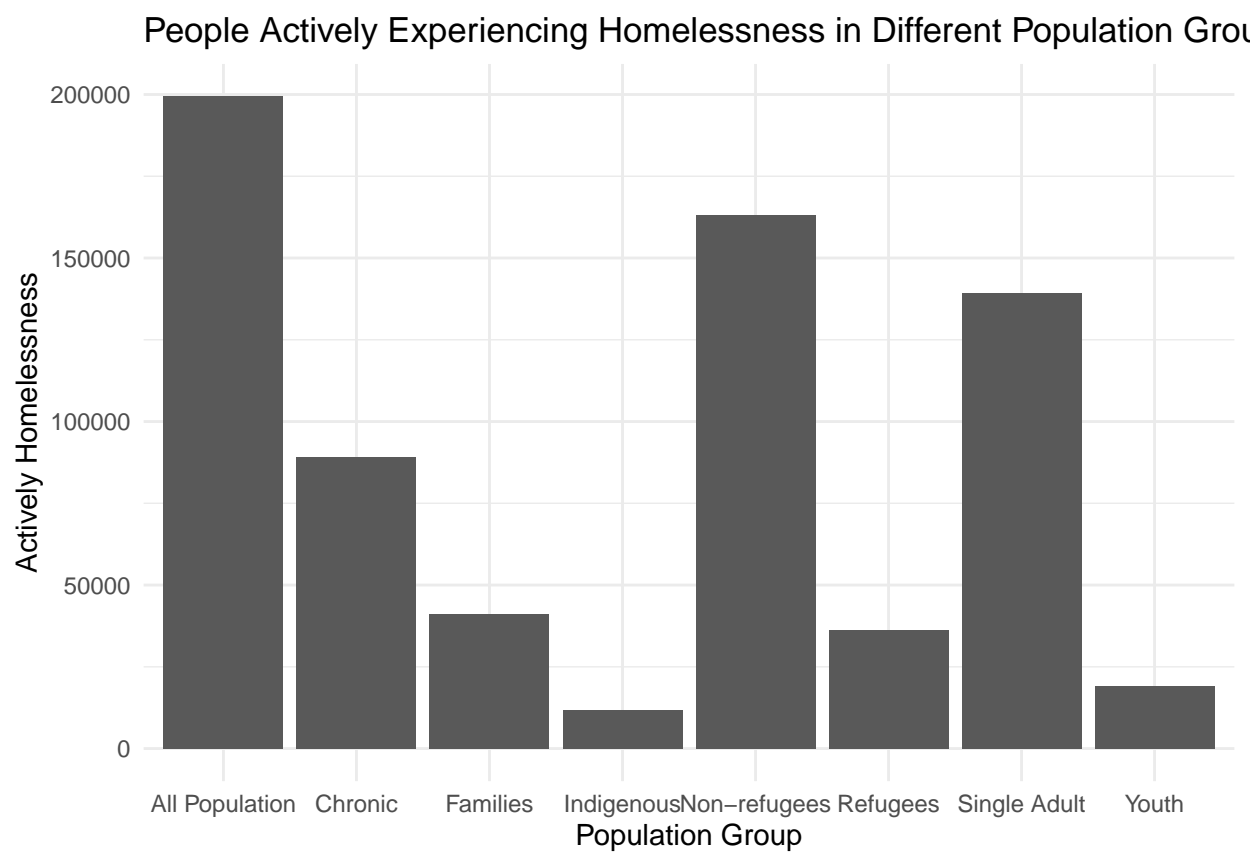


Figure 3: The number of people actively experiencing homelessness in different population group

The data divide homeless people into several categories: Indigenous, refugees, families, individuals, and children. From figure 3, single adults account for the largest share among people actively experiencing homelessness, while youth accounts for 1/10 of all. Refugees account for about one-sixth of the total.

3 Discussion

From tables and graphs above, we can conclude that people experiencing homelessness shrinks in 2020. However, there is an increasing trend for the number of homeless people in 2021. Based on shelter use, we estimate that the homeless population declined in 2020 and rebounded in 2021.

There are some ethical biases in our dataset. The data divide people into different groups including refugees and indigenous shown in figure 3. These categories aren't mutually exclusive and aren't of a single type like family status or racial identity. The data is not broken down by race, but it is separate indigenous and refugees, which seems inappropriate. This reflects people's subconscious belief that refugees and indigenous account for a very high proportion of the homeless population. However, as can be seen from Figure 3 non-refugees comprise a larger unhoused population. The truth is that refugees and Canadians have very little difference in tax, unemployment rate, and education level. For example, middle-aged refugees have an unemployment rate of 9%, which is close to that of Canadian-born citizens (6 %). (UNHCR, n.d.) What's more, the collection of data violates voluntary principles. Homeless people who receive shelter benefits do not have the right to opt-out of disclosing their race, age, and other information.

There is also some statistical bias in our data. First, only the data of shelters using the SMIS system were included in the data, and the information of shelters using other systems was not collected. Second, the Toronto shelters system flow dataset only collects information on people who have spent the night in shelters. Information on large numbers of people living outdoors is difficult to obtain.

4 References

- R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- H. Wickham. *ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York, 2016.
- Sharla Gelfand (2020). *opendatatoronto*: Access the City of Toronto Open Data Portal. R package version 0.1.4. <https://CRAN.R-project.org/package=opendatatoronto>
- Sam Firke (2021). *janitor*: Simple Tools for Examining and Cleaning Dirty Data. R package version 2.1.0. <https://CRAN.R-project.org/package=janitor>
- UNHCR. (n.d.). Refugees in Canada - United Nations Refugee Agency. UNHCR Canada. <https://www.unhcr.ca/in-canada/refugees-in-canada/>
- City of Toronto. (2020, December 3). City of Toronto continues to take extraordinary steps to help and protect people experiencing homelessness during COVID-19. City of Toronto. Retrieved February 4, 2022, from <https://www.toronto.ca/news/city-of-toronto-continues-to-take-extraordinary-steps-to-help-and-protect-people-experiencing-homelessness-during-covid-19/>
- Hao Zhu (2021). *kableExtra*: Construct Complex Table with ‘kable’ and Pipe Syntax. R package version 1.3.4. <https://CRAN.R-project.org/package=kableExtra>
- Gelfand, Sharla. 2020. *Opendatatoronto: Access the City of Toronto Open Data Portal*. <https://CRAN.R-project.org/package=opendatatoronto>.
- R Core Team. 2020. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. <https://ggplot2.tidyverse.org>.