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How Do Youth Use Homeless Shelters?

Ali Jadidzadeh[a,b] and Ron Kneebone[b]

[a]Department of Economics , University of Tehran, Tehran, Iran; [b]The School of Public Policy, University of Calgary Downtown Campus, Calgary, Canada

ABSTRACT

This paper uses a large administrative dataset providing 105,149 daily observations on 3,176 youth aged between 18 and 24 years using emergency homeless shelters from January 1, 2014, to December 31, 2019, in Calgary, Alberta, Canada. Using k-mean cluster analysis we classify youth who use emergency homeless shelters by their intensity of shelter use. In Calgary, most youth use homeless shelters as a temporary and infrequent refuge when housing is lost. For these youth, shelters are an effective and relatively inexpensive approach for helping them resolve their homelessness. A significant number, however, rely on shelters for much longer stays. For these youth, shelters are ineffective and expensive responses to their homelessness. To understand how youth are changing their use of shelters over time, we introduce time series measuring first admissions and readmissions to shelters. We show that how youth use shelters, and how that use has changed over time, differs for youth who self-identify as Indigenous, Caucasian and visible minority.

Introduction

In their review of the policies and practices of intervention to address youth homelessness, Gaetz et al. (2013) pose the question of whether it is necessary to study youth homeless as an issue separate from adult homelessness. They respond that yes, it is necessary, for the simple reason that unlike older adults experiencing homelessness for the first time later in life, young people experiencing homelessness are leaving or fleeing households where they were dependent on adults for food and shelter. Without experience at earning a living, securing shelter, paying bills, and everything else that forms the foundation for security of person and healthy relationships, many adolescents are overwhelmed and must scramble to establish themselves without very much in the way of support or prior experience. The unique set of circumstances they face is reason enough to recognize that research on the experiences of youth with homelessness deserves separate treatment. This paper is a contribution to understanding the problem of

CONTACT Ron Kneebone ✉ kneebone@ucalgary.ca 🖂 The School of Public Policy, University of Calgary Downtown Campus, Calgary, Alberta T2P 1H9, Canada.

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homelessness as it is experienced by youth trying to negotiate the transition to adult status.

An emphasis of the literature examining youth homelessness is that differences in experience and differences in personal characteristics play a role in how they meet their need for shelter. For example, Rossi (1991), and more recently Wusinich et al. (2019), show that youth who use shelters are more tolerant of rules governing their behavior, including rules that enforce gender segregation, attendance at religious services, and restrictions on pets. Hail-Jares et al. (2020) report that the characteristics of young people who couch-surf differ noticeably from those who experience homelessness by rough-sleeping or staying in institutions. Mallett et al. (2004) show that youth who are newly homeless are quite distinct from those who are chronically homeless in terms of characteristics such as age, school attendance, substance abuse, shelter use, and suicide attempts. Toro et al. (2011) summarize various typologies that have been used to describe the heterogeneous population of youth experiencing homelessness, typologies that are based on family relationships, the reasons for them leaving home, their history of abuse and neglect, their connectedness with institutions and their involvement in risky behaviors. Finally, Heinze et al. (2012) and Mallett et al. (2004) identify youth by their reasons for, and pathways into youth homelessness while Slesnick et al. (2008) identify youth by the different pathways used to escape homelessness and enter housing stability.

A broad conclusion to be drawn from this literature is that there is a good deal of heterogeneity in the characteristics of youth experiencing homelessness, a heterogeneity that shows up in how they manage their homelessness and how they negotiate their pathways into and out of homelessness. This suggests that effective responses offered by policymakers and social agencies must themselves be many and varied as for each to be most effective they should be targeted at distinct populations.

In this paper, we study how youth use emergency shelters. Our approach includes using cluster analysis, as first introduced by Kuhn and Culhane (1998), to characterize youth by the length and frequency of their shelter stays. In addition to the use of cluster analysis, we follow an approach introduced by Culhane et al. (1994) and applied to stays in homeless shelters by adults in New York and Philadelphia, to show how the size of the flow of youth into homeless shelters for the first time has changed over time. We compare these first admissions to the number of re-admissions following an extended stay outside the shelter system. In this way, we provide further insights into how youth make use of emergency shelters. To our knowledge, our application of this approach to the use of shelters by youth is unique.

We use these results to comment on the usefulness of homeless shelters as an option for addressing the problem of youth homelessness. If, as is often found in studies that focus on adults, 80% (Kuhn & Culhane, 1998) or more of

people experience only short and infrequent spells of homelessness, then an effective policy response to youth homelessness may be one that provides a short-term solution perhaps requiring very little in the way of services. Is this the case for youth who use shelters? Do youth use shelters as a temporary and infrequently utilized refuge, perhaps in response to an unexpected crisis, or do they use shelters as a permanent or semi-permanent source of housing? If the latter is true, shelters are more likely to represent expensive and less effective interventions relative to initiatives such as rapid housing or street outreach programs. As part of our analysis, we will investigate the extent to which answers to these questions vary by the ethnicity of youth using shelters and so the extent to which well-targeted responses must be sensitive to ethnicity.

We employ secondary use of anonymized administrative data describing the use of emergency shelters by youth aged 18 to 24 years of age in Calgary, Alberta, Canada. As we describe in detail below, the data set is large, describing the daily movements in and out of emergency shelters of over 3,000 uniquely identified youth over the period 2014 to 2019. The size and breadth of our dataset allows us to produce a detailed description of emergency shelter use by youth, to break down that response by ethnicity, and show how patterns and intensity of shelter use have changed over time. To our knowledge, this study examining youth homeless in Calgary, and the study by Jadidzadeh and Kneebone (2018) who examine shelter use by youth in Toronto, are the only applications of analyses like these to identify the patterns and intensity of use of emergency shelters by youth.

In the next section, we provide background relevant to understanding youth homelessness in Calgary. Following that we briefly describe the k-means cluster approach and then the data used in this study. After discussing the results of the cluster analysis, we turn to describing how first admissions and readmissions of youth into shelters has changed over time and how those changes can be interpreted as measures of the influence of the policies of the homeless serving sector and/or changes in community conditions that influence rates of youth homelessness. Finally, we offer a conclusion that summarizes our results and discusses their implications and offer suggestions for next steps to be taken to better understand what interventions might be most effective at addressing youth homelessness.

Background

In Calgary, the homeless serving sector is coordinated by the Calgary Homeless Foundation. The CHF plays a key role in funding and coordinating the responses of social agencies and shelter providers to changes in the needs of the population experiencing homelessness. To better understand the needs and challenges of the homeless serving sector, the CHF collects and maintains

a large dataset describing the daily movements into and out of shelters. Upon first entry into a homeless shelter in Calgary a person is assigned a unique identifier that makes it possible for the CHF to observe that person's movements between shelter operators and between the shelter system and the community. The data also identifies the person's age, gender, and ethnicity.[1] For this study we focus on the data describing shelter use by youth who were aged 18 to 24 years on the date of first entry into the shelter system. Prior to providing us with data, the CHF removed all identifying information so that the data we use is secondary use of anonymized administrative data.

In Calgary, there are currently four operators of emergency homeless shelters open to accepting youth aged 18 to 24 years of age; Mustard Seed, Salvation Army, Alpha House, and the Drop-In & Rehabilitation Center Society (DI).[2] Our data describe the patterns of stays by youth in these four emergency shelters.

It is important to note that our data set enumerates the number of youths making use of emergency shelters, not the total universe of all youth in Calgary experiencing homelessness. To gain insight into the latter, we need to rely on periodic point in time counts. Since 2014, four point in time counts have been conducted in Calgary. Each count reports the number of people experiencing homelessness by age and reports where on the night of the count they were found, whether in a shelter, in a public institution, or sleeping rough. Table 1 provides data on the total number of people, identified by age groups, experiencing homelessness on the night of each point in time count (PiT) and the number of people on each of those nights who stayed in an emergency shelter (Shelter). For each age group, we calculate what percentage of those experiencing homelessness on that night made use of an emergency shelter.

The table shows that youth who are experiencing homelessness make significantly less use of emergency shelters than do older adults. Whereas on the night of the point in time count only one in four youth experiencing homelessness were staying in an emergency shelter, one half of older adults were doing so.

Methodology

We employ k-mean clustering to examine the nature of shelter use by youth in Calgary. The method has been frequently used to describe the use of homeless

Table 1. Homeless shelter use by youth experiencing homelessness.

Date of Point in Time Count	Youth, aged 18–24 years			Adults, aged 25 years and above		
	PiT	Shelter	Shelter/PiT	PiT	Shelter	Shelter/PiT
January 15, 2014	339	84	24.8	2,862	1,572	54.9
October 16, 2014	271	66	24.4	2,850	1,511	53.0
October 19, 2016	300	54	18.0	2,751	1,434	52.1
April 11, 2018	216	62	28.7	2,392	1,301	54.4

Notes: Youth aged 18–24 years on day of count. Point-in-time count data are from Calgary Homeless Foundation (2014, 2016, 2018).

shelters by single adults. The seminal paper by Kuhn and Culhane (1998) examined shelter use by single adults in New York City and Philadelphia. Similar studies in Canada include the examination of shelter use by single adults in Calgary (Kneebone et al., 2015), Toronto, Guelph and Ottawa (Aubry et al., 2013) and Victoria (Rabinovitch et al., 2016). Less frequently, the approach has been used to examine the use of emergency shelters by families. Examples include Culhane et al. (2007), who examine family homelessness in four US cities, and Jadidzadeh and Kneebone (2018) who examine the use of family shelters in Toronto. To our knowledge, the only applications of k-mean cluster analysis to describe the patterns and intensity of homeless shelter use by youth is this current study and that of Jadidzadeh and Kneebone (2018) who examine data describing shelter use in Toronto.

Typologies of shelter use have traditionally identified three types of shelter users. Differences in shelter use have focused on the number of homeless episodes (or events) and the average stay (or length) associated with those episodes. Figure 1 defines the three types of shelter users frequently used: *transitional, episodic*, and *chronic*.

Transitional users of shelters do so only infrequently (few episodes) and the length of their typical stay is short. Episodic users of shelters make more frequent use the shelter system but, like transitional users, each episode of shelter use is relatively short. So-called chronic users of shelters have few episodes but the average length of stay in a shelter is long.

The unit of observation in our study is daily. Thus, a typical observation might identify person X as entering the shelter system on January 21 exiting on March 25, reentering on August 13, and etcetera. The methodology involves examining the information provided on entries and exits by every individual using the shelter system over an entire, appropriately defined sample period. Based on these histories, shelter users are classified as transitional, episodic, or chronic users of shelters. The separation of individuals into these groups is determined endogenously. That is, the method "clusters" individuals into groups in such a way that the shelter use of youth allocated to each of the groups is clearly different in length of stay and frequency of use.

Applying the clustering methodology requires the clarification of some definitional issues. One must, for example, define a shelter "episode." We follow the practice in the literature of defining an episode as a period in

	Few Episodes	Many Episodes
Short Stays	Transitional	Episodic
Long Stays	Chronic	--

Figure 1. Patterns of shelter stays.

a shelter that is separated from another period in a shelter by at least 30 days. Thus, if a person were to enter the shelter system on January 15, exit on January 25, enter again on February 2 and exit on February 24, the number of days in which this person stayed in shelters between January 15 and February 24 would define the number of days in a single episode. This is so because the exit on January 25 and the entry on February 2 is separated by less than 30 days. Were this person to enter the shelter system again on May 2, this would define the start of a second episode because this new entry is more than 30 days since the last exit.

The data and data cleaning

We employ secondary use of anonymized administrative data to classify youth shelter users in emergency shelters established by four providers: Mustard Seed, Salvation Army, Alpha House, and the Drop-In & Rehabilitation Center Society (The DI). The data provided to us spans the period January 1, 2014, to December 31, 2019, and describes the date and time of day that a youth entered and exited a shelter.[3] The full dataset contains 199,053 observations on 5,240 unique individuals aged between 18 and 24 years of age over this period.

Application of the cluster analysis requires that we omit some of these observations. That is, we must "clean" the data to remove observations that, for one reason or another, need to be excluded from the analysis so we can accurately identify patterns of shelter use. There are three adjustments we need to make. *First*, we left censor our data by excluding observations on shelter use by youth who first entered a shelter prior to January 1, 2014. The reason for excluding these observations is that we need to ensure we have full information on the shelter use of youth included in our sample. Someone in our data set on January 1, 2014, may have entered the shelter system at some unknown prior date making it impossible for us to accurately determine their pattern of shelter use. This adjustment causes us to lose 66,120 observations on the shelter use of 717 youth. *Second*, we right censor our data by excluding observations on individuals who first enter a shelter after December 31, 2018. We do this to ensure that individuals in our dataset have had at least 12 months to reveal their pattern of shelter use. This adjustment causes us to lose 6,769 observations on 676 individuals. *Third*, we exclude observations on youth whose times of entry into and exit from a shelter suggests they did not use a bed.[4] This adjustment means we lose 21,015 observations on 671 individuals. After these adjustments, we are left with what remains a very large sample of 105,149 observations on 3,176 youth using Calgary's shelter system over the period from January 1, 2014, to December 31, 2019.

Cluster analysis results

Table 2 shows that of the 3,176 individuals aged 18 to 24 years upon first entry into the shelter system by far the largest number – 2,743 or 86.4% of the total – used the shelter system infrequently and for relatively short stays. These youth experienced, on average, just 1.50 episodes of shelter use over the 6-year period. On average, these youth stayed a total of only 13.8 days over 6 years for an average of 9.1 days per episode. These youth used shelters for an average of 2.3 days per year.

Two-thirds of youth identified as transitional shelter users experienced just one episode over the 6 years of our sample and 18.9% experienced two episodes. While stays in shelters by transitional users were short and infrequent, the large number of transitional users means that they nonetheless filled 36% of all the shelter beds used by youth.

Of the 3,176 youth using the Calgary shelter system over the period 2014–19, only 320 – just 10.1% of all youth using shelters – can be classified to have been episodic shelter users. These youth experienced, on average, 7.03 episodes of shelter use over the 6-year period with the average episode lasting 12.31 days. The average episodic user of shelters stayed 77.89 days in total. Most (65.3%) of episodic users experienced 6 or more episodes of shelter use and all experienced 4 or more episodes. Episodic users occupied 23.7% of all beds filled by youth.

Finally, of the 3,176 youth who used the Calgary shelter system over the period 2014–19, only 113 – just 3.6% of all youth using shelters – can be classified to have been chronic shelter users. On average, these youth experienced just 4.8 episodes of shelter use over the 6-year period, but the average episode lasted just over 116 days. The average chronic shelter user stayed a total of 374.91 days over the 6-year period of our sample. Chronic users,

Table 2. Patterns of shelter use by youth, 2014–2019.

Clusters	Transitional	Episodic	Chronic	Total
Sample Size	2,743	320	113	3,176
Percentage of Clients	86.4	10.1	3.6	100
No. of Episodes	1.50 (0.83)	7.03 (2.69)	4.79 (3.16)	2.18 (2.16)
Total No. of Days	13.80 (28.58)	77.89 (65.45)	374.91 (174.77)	33.11 (83.04)
No. of days per episode	9.09 (20.86)	12.31 (11.79)	116.02 (102.27)	13.22 (33.91)
No. of days per episode (%)				
1–30	92.4	90.0	4.4	89.0
31–60	4.2	10.0	25.7	5.6
61–90	1.9	0.0	28.3	2.6
91 or more	1.5	0.0	41.6	2.7
No. of Episodes (%)				
1	67.6	0.0	7.1	58.6
2	18.9	0.0	15.0	16.9
3	9.3	0.0	22.1	8.8
4	4.2	10.0	17.7	5.3
5	0.0	24.7	6.2	2.7
6 or more	0.0	65.3	31.9	7.7
No. of occupied shelter sleeping beds	37,860	24,924	42,365	105,149
Percentage of occupied sleeping beds	36.0	23.7	40.3	100.0

Note: Numbers in parentheses are standard deviations.–

despite being only 3.6% of all youth shelter users, occupied 40.3% of all beds used by youth over the 2014–19 period.

Table 3 summarizes the demographic characteristics of the youth who fit the typology of each of the three categories of shelter user. The table reports a sizable difference in gender breakdown across the three definitions of shelter users. Males dominate the population of youth experiencing homelessness and using homeless shelters. This is particularly so when it comes to chronic users of shelters where over 80% of clients are male. The average age of youth in the three categories is nearly identical and there is not a noticeable difference is in terms of the age distribution in the three categories.

Youth who self-identify as Indigenous are over-represented among those utilizing shelters. The census for 2016 shows that of the 165,795 people living in Calgary aged between 15 and 24 years, only 4.2% identified as Indigenous.[5]

Jadidzadeh and Kneebone (2018) perform a similar analysis of the use of homeless shelters by youth in Toronto.[6] Observing the behavior of 8,000 youth over 6 years (2011–2016) they also found that most (81.8%) youth using shelters did so infrequently and for short periods and so could be classified as transitional shelter users. In Toronto, however, transitional shelter clients experienced much longer stays per episode (35.4 days) than in Calgary (9.1 days). Youth whose stays in shelters could be classified as chronic similarly differed in terms of average stays per episode in the two cities. In Toronto, the average length of stay per episode for a chronic user of shelters was 329.7 days, considerably longer than the 116 days in Calgary. How youth use homeless shelters is therefore quite different in the two cities.

Costing

In Calgary, 2,743 youths, or 86.4% of all youth making use of the shelter system over the period 2014 to 2019, stayed in shelters infrequently and for

Table 3. Demographic composition of youth users of shelters.

Clusters	Transitional	Episodic	Chronic	Total
Unique Clients	2,743	320	113	3,176
Gender (%)				
Male	69.6	65.9	80.5	69.6
Female	30.1	33.1	18.6	30.0
Transgender	0.3	0.9	0.9	0.4
Average Age	21.15 (2.01)	21.30 (1.98)	21.15 (1.95)	21.16 (2.00)
Age Groups (%)				
18	13.1	10.9	13.3	12.9
19	13.1	11.9	12.4	12.9
20	13.3	14.4	9.7	13.3
21–22	29.7	29.7	34.5	29.9
23–24	30.8	33.1	30.1	31.0
Ethnicity (%):				
Caucasian	50.0	39.7	45.1	48.8
Indigenous	31.5	45.0	28.3	32.6
Other	18.5	15.3	26.5	18.5

Notes: (1) Numbers in parenthesis are standard errors. (2) Age is defined by age on first entry into the shelter system.

short stays. These transitional users of shelters experienced, on average, just 1.50 episodes of shelter use and stayed for a total of just 13.8 days. We assume that in 2018, the average operating cost of providing an emergency shelter bed in Calgary was approximately 85 CAD per night.[7] Over the period of our analysis, then, it cost the shelter system an average of 196 CAD per year to assist a youth identified as being a transitional user of shelters in their efforts to navigate their way toward permanent housing. The annual shelter costs are higher for those youth whose use of shelters identifies them as being an episodic or chronic user because they stay in shelters for longer periods. Each episodic user cost the shelter system an average of 1,1039 CAD per year while each chronic user cost 5,311 CAD per year.

Similar calculations can be made for Toronto by using the results reported by Jadidzadeh and Kneebone (2018). Assuming the same nightly cost of providing a shelter bed, the calculations reported by those authors imply each youth identified as a transitional user of shelters imposed an annual cost of 646 CAD on the system, or 3.3 times the cost imposed on the shelter system in Calgary. Each episodic user of shelters cost the shelter system 2,962 CAD per year and each chronic user 7,677 CAD per year.[8]

This costing exercise illustrates two key results. First, for 86% of the youth in Calgary who use them as a means of dealing with homelessness, shelters are a very cost-effective response of the homeless serving sector. Second, this conclusion may not be appropriate for every community responding to youth homelessness. The cost of using shelters to assist youth in their adjustment toward permanent housing is 3.3 time higher in Toronto. This higher cost is due to the greater use of shelters by youth in Toronto and that, in turn, is the result of local conditions that cause youth to rely more heavily on shelters in Toronto than in Calgary. Appropriate policy responses to youth homelessness are likely to be most effective when tailored to local conditions.

First admissions and readmissions

Cluster analysis is useful for identifying people experiencing homelessness by the patterns and intensity of shelter use. However, the approach requires observing people over a period long enough to fairly evaluate how they use shelters. The approach does not allow an assessment of how shelter use may be changing over that period. Insights into these changes are possible, however, by use of calculations introduced by Culhane et al. (1994) and first applied to stays in homeless shelters by adults in New York and Philadelphia.

Our data enable us to identify, for each day over the period from January 1, 2014, to December 31, 2019, how many youths aged 18–24 years used a homeless shelter for the first time (first admission) and how many were returning to use a shelter following a first admission sometime in the past (readmission).

Measuring shelter use in this way provides a gauge against which one may evaluate efforts to reduce the inflow of youth into shelters and efforts to speed the exit of youth from shelters. These measures can also be used to evaluate the effects on shelter entries and exits of changes in community conditions influencing youth homelessness.

Over our sample period of January 1, 2014, to December 31, 2019, an average of 51 youth per month entered the shelter system for the first time and an average of 353 were readmitted each month. Dividing the average monthly inflow of new shelter admissions (51) by the average number of youths in the shelter system during an average month (379) gives us the percentage of shelter beds that were, on average, filled each month by youth newly admitted to the shelter system. Our calculations show that 13.4% of shelter beds used by youth were emptied and filled again each month by youth completely new to the system. This turnover rate varies slightly by ethnicity. For youth who self-identify as Caucasian, the turnover rate was slightly higher (14%) than the average and for youth who self-identify as Indigenous it was slightly lower (11.6%).

In Figure 2, panels (a) and (b) plot monthly values of total first admissions and readmissions of youth into homeless shelters over time. These data show a gradual fall in the average monthly number of first admissions from 2014 to 2017 to a constant trend thereafter. Readmissions similarly declined during the first half of our sample period but have grown since 2017.

Changes in measures of first admissions and readmissions are indicative of the success of efforts by the homelessness serving sector, and/or the impact of changes in community conditions impacting homelessness, at slowing the entry of youth into homeless shelters and speeding their exit. The data in Figure 2 suggest that during the early part of our sample period, the combined effects of these influences was to slow new entries into, and speed exits from, homeless shelters. After 2017, however, first admissions stopped falling and remained more or less constant while readmissions began to climb. The net effect was a gradual increase in the number of youths making use of shelters after 2017.

As with turnover rates, these patterns vary by ethnicity. The generally downward trend in monthly first admissions was driven mainly by Caucasian youth. Trends in first admissions for Indigenous youth and those identifying as visible minorities are also downward but noticeably shallower than the trend for Caucasians. With respect to readmissions, monthly readmissions of Caucasian youth show a statistically significant downward trend over the entire period while monthly readmissions of Indigenous youth show the opposite; a more or less steady and statistically significant increase over time. There is no discernible pattern of change in the readmissions of youth identifying as visible minorities. These results are useful for identifying the key influences on these movements. The fact that the increase in readmissions is
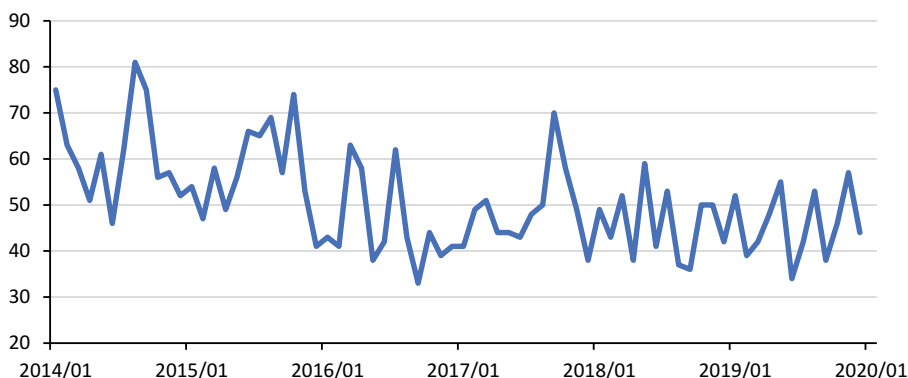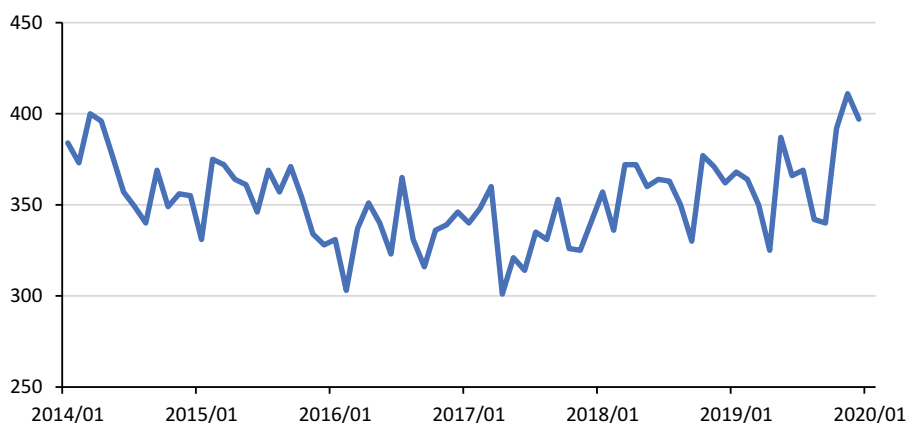
(a) First Admission

(b) Readmissions

Figure 2. First admissions and readmissions of youth into homeless shelters, all ethnicities, 2014–01 to 2019–12.

driven mainly by Indigenous youth is a helpful signal pointing to changes in causes of homelessness to which Indigenous youth are most susceptible.

Conclusion

This paper has examined an anonymized administrative data set containing 105,149 observations on 3,176 youth, aged 18 to 24 years, using Calgary's shelter system over the period from January 1, 2014, to December 31, 2019. The size and breadth of our dataset has allowed us to identify differences in shelter use according to the age and ethnicity of youth. Understanding differences in the pattern and intensity of shelter use along these dimensions is important to developing practical and well-targeted solutions to the problem of homelessness as it is experienced by youth.

To our knowledge, this paper and that of Jadidzadeh and Kneebone (2018) who describe the pattern and intensity of use of homeless shelters

by youth in Toronto, are unique in applying k-mean cluster analysis specifically to the issue of youth homelessness. Like that study of youth homelessness in Toronto, we find that over 80% of youth using shelters do so relatively infrequently and for short periods of time relative to their peers and so can be classified as transitional users of shelters. For the majority of youth then, shelters serve the purpose for which they are intended, namely, to provide a bed that is used for a very short time following an emergency that arises infrequently. For these youth, homeless shelters are a cost-effective response. We find that for over 86% of youth in Calgary, homeless shelters offer a very inexpensive response to the need of youth for an infrequently accessed and lightly used shelter option. For a significant minority of youth, however, shelters are an expensive way for the homeless serving sector to help youth as they struggle to establish permanent housing. Targeted interventions aimed at these youth have the potential to yield a substantial saving by closing 40% of beds currently used by youth.

A comparison of the patterns and intensity of use of shelters by youth in Calgary and Toronto indicates many similarities, particularly the similar distribution of youth across the transitional, episodic, and chronic classifications of shelter use, but important differences as well. Important here is the finding that the average episode of shelter stay by youth is much longer in Toronto than in Calgary. In Toronto, shelters are a noticeably more expensive way for the homeless serving sector to assist youth experiencing homelessness. An important conclusion is that appropriate responses to youth homelessness need to be tailored to local conditions.

In addition to describing the patterns and intensity of use of homeless shelters, we identified the size and change over time in first admissions and readmissions of youth into shelters. How first admissions and readmissions change over time is indicative of the influences of changes in the policies of the homeless serving sector and community conditions that impact youth homelessness. Our results suggest that in Calgary, influences on how youth make use of homeless shelters changed after 2017 and that the response differed by the ethnicity of youth. This is an important avenue for future research for these results are suggestive that any policy intended to influence youth homelessness needs to be well-targeted and well-timed and be sensitive to what may be the different responses of youth who identify as Caucasian, Indigenous, and visible minority.

We are conscious of having raised at least as many questions as we have answered but we are hopeful our results point others in the direction of fruitful research. Future research should seek to better understand how shelter use by youth changes over time, why shelter use varies by ethnicity, and most importantly, what interventions might be most appropriate for preventing youth from experiencing homelessness at all.

Notes

1. Upon first entry into the shelter system, people are asked to self-identify their ethnicity. We group youth into one of three ethnic categories: Caucasian, Indigenous, and visible minorities.
2. Other emergency shelters in Calgary are only open to families or to single pregnant women (Brenda's House and Inn from the Cold). Boys and Girls Clubs of Calgary provides emergency shelter for children aged 12–17 year and children aged 15–18 years with child welfare status. Our data set does not include violence against women shelters or shelters for older adults fleeing elder abuse. In Calgary, the YWCA maintains a small emergency shelter for single women without children, but we were unable to access these data.
3. We deliberately truncated our data to the end of 2019 to avoid any potential impacts of COVID-19 on shelter movements. First reports of COVID-19 cases in Calgary were not reported until early in March 2020.
4. Calgary's shelters provide beds but also provide meals and drop-in facilities that may be used by someone who does not stay the night and use a bed. This person may be a "rough sleeper" (someone who sleeps outdoors) and so someone we would like to include in our sample but may also be someone who is housed. To avoid including observations of youth who are housed we exclude these shelter entries and exits involving individuals who (i) both entered and exited a shelter before 4:00 am on the same day, (ii) entered the shelter before 4:00 am and exited less than 2 hours later, and (iii) entered a shelter after 4:00 am and exited less than 24 hours later.
5. The 15–24-year-old age category does not exactly match the definition of youth (aged 18–24) used in this study, but the calculation of over-representation is not likely effected. Data is from Statistic Canada, Aboriginal Peoples Highlight Tables, 2016 Census.
6. In that data set, youth were defined as aged between 16 and 24 years on first entry into the shelter system.
7. The amount various by shelter and services provided. For shelters operating in 2005, Pomeroy (2005) estimated a range of 25 to 110 CAD per night. The estimate we use is the middle of this range when expressed in 2018 dollars. CAD identifies Canadian dollar amounts. Multiplying by 0.8 is approximately correct for reporting in US dollars (USD).
8. Weare (2021) examines shelter use by youth in Sacramento, California, and reports an annual cost of 3,601 USD (approximately 2,881 CAD) for providing a shelter bed to one youth. Weare does not differentiate between transitional, episodic, and chronic users of shelters and so his figure should be interpreted as representing the weighted average of the cost of sheltering these three classifications of shelter users. Comparable figures for Calgary (469 CAD) and Toronto (1,541 CAD) are much lower mainly because at 45.2 days, youth making use of shelters in Sacramento have much longer average annual stays than in either Calgary (5.5) or Toronto (18.1). Weare uses an estimate of 68.50 USD as the cost of providing a shelter bed in Sacramento. At the equivalent of 85.60 CAD this is almost exactly the price we understand to be a fair representation of the cost of providing a shelter bed in Calgary and Toronto.

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