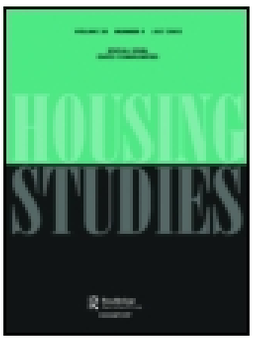

Housing Studies

ISSN: 0267-3037 (Print) 1466-1810 (Online) Journal homepage: http://www.tandfonline.com/loi/chos20

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To cite this article: Hannah Rabinovitch, Bernadette Pauly & Jinhui Zhao (2016): Assessing emergency shelter patterns to inform community solutions to homelessness, Housing Studies, DOI: 10.1080/02673037.2016.1165801

To link to this article: http://dx.doi.org/10.1080/02673037.2016.1165801

Published online: 28 Apr 2016.

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HOUSING STUDIES, 2016
http://dx.doi.org/10.1080/02673037.2016.1165801

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Assessing emergency shelter patterns to inform community solutions to homelessness

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ABSTRACT

The goal of this study was to examine individuals' emergency shelter stay records to gain insight into cycles of homelessness and strategies to end homelessness. We examined over 46 000 records of 4332 unique individuals from six of Victoria, Canada's adult emergency shelters from May 2010–May 2014. Individuals' stay records were clustered using the k-means cluster analysis, based on total days stayed and total number of episodes of homelessness over the four-year period. Consistent with other Canadian cities, three significant clusters emerged from the analysis: temporary, episodic and long stay. The episodic and long-stay cluster accounted for more than 50 percent of shelter bed nights. Age and gender were analyzed, with seniors more likely to be represented in the long-stay cluster. These findings highlight the need for prevention and rapid re-housing initiatives for those experiencing temporary shelter use, and housing with intensive supports for those in the episodic and long-stay clusters.

ARTICLE HISTORY
Received 26 October 2015
Accepted 21 February 2016

KEY WORDS
Homelessness; cluster analysis; emergency shelter; homelessness solutions; emergency shelter use patterns

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Background

Since the 1980s, rates of homelessness have been steadily rising across Canada (Gaetz *et al.*, 2013). Current estimates suggest that at least 235 000 people experience homelessness each year in Canada (Gaetz *et al.*, 2014). Some have called this a crisis or epidemic (Toronto Disaster Relief Committee, 1998). Homelessness is affecting a growing number of Canadians including women, youth, seniors, and families (Gaetz *et al.*, 2013; Segaert, 2012).

The Canadian Homelessness Research Network (2012) defines homelessness to include both those without permanent housing and those at risk of homelessness. The Canadian Homelessness Research Network typology of homelessness encompasses a range of possible circumstances, including a state of being unsheltered, emergency sheltered, provisionally accommodated, and at risk of homelessness. Explanations for the rising rates of homelessness in Canada include the loss of federal funding for affordable housing, lower provincial social assistance rates, deinstitutionalization, and decreasing housing affordability in relation to income (Aubry *et al.*, 2013; Gaetz *et al.*, 2014; Moore & Skaburskis, 2004).

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An important change in policy responses to this growing issue has been the shift from emergency management of homelessness to ending homelessness, with an emphasis on finding what solutions work for whom and in which situation (Dunn *et al.*, 2013; National Alliance to End Homelessness, 2012; Pauly *et al.*, 2014). In an effort to better understand the needs of a growing diversity of people who experience homelessness, and to inform program and policy directions, there is a need for meaningful information on group differences within the population of people who experience homelessness. One approach to generating meaningful data to inform homelessness interventions is the development of group typologies based on clustering patterns of shelter usage over time. This approach was first developed by Kuhn & Culhane (1998).

Kuhn & Culhane's seminal study (1998) clustered shelter use patterns into three typologies: chronic, episodic, and transitional. The transitional homelessness population was defined as experiencing homeless once, for a short period of time (Kuhn & Culhane, 1998). The episodic homelessness population was defined as people with the most episodes of shelter use, moving between shelters, jails, hospitals, and other settings over time (Kuhn & Culhane, 1998). The chronic homelessness population was defined as 'people who are likely to be entrenched in the shelter system, and for whom shelters are more like long-term housing than an emergency arrangement' (Kuhn & Culhane, 1998, p. 211). In their analysis, those in the episodic and chronic cluster tended to have more physical, mental illness and substance use problems than those in the transitional cluster (Kuhn & Culhane, 1998). This is not surprising, as homelessness has been found to contribute to these problems (Culhane *et al.*, 2010; Feng *et al.*, 2013; Hodgetts *et al.*, 2007; Hopper *et al.*, 2010; March *et al.*, 2006; Quigley & Raphael, 2001). These three typologies of homelessness have had a significant impact on increasing understandings of and developing targeted solutions to end homelessness based on length and type of shelter stay.

In the first Canadian study to examine typologies of shelter use, Aubry *et al.*, (2013) corroborated these categorizations in a Canadian context. In their study of homeless shelter usage in three cities in Ontario of varying sizes, Aubry *et al.* (2013) found clusters of shelter usage patterns that aligned with Kuhn & Culhane's (1998) typologies. Similar to Kuhn and Culhane's typologies, Aubry and colleagues (2013) found three similar clusters—temporary, episodic, and long-stay. In their study, temporary shelter use with short stays represented the highest percentage of shelter users, episodic shelter use made up between 8 and 10 percent, and long-stay use made up only 2–4 percent of shelter users (Aubry *et al.*, 2013). Episodic and long-stay users combined made up over 50 percent of all bed days, despite their low proportion of total shelter users (Aubry *et al.*, 2013). All of the cities included in this study were in Ontario and two of the three cities were large urban centers. Aubry *et al.* (2013) highlighted the need for similar research to be conducted in other Canadian cities, particularly mid-sized and smaller cities, as the smaller city included in their study had limited data availability.

Gaining deeper insight into shelter usage is crucial for generating effective policies and solutions to addressing homelessness. However, critics of this approach raise concerns that these three typologies have become axiomatic in homelessness research (McAllister *et al.*, 2011). The critics argue that typologies of shelter use should vary based on theoretical frameworks and research purposes, and should not be oversimplified by empirical accuracy (McAllister *et al.*, 2011). Further, these critics argue that just because previous data match the three typologies does not mean that they are the best method to explain and understand

nuanced differences in homelessness trajectories. McAllister *et al.* (2011) suggest a time-patterned approach for typologizing shelter use. Using this approach, they produced 10 distinct typologies of shelter usage by stay pattern. This includes a significant typology missing from previous analyses: users who stay for long periods over many episodes (McAllister *et al.*, 2011). Several variations within the episodic and temporary user typologies also emerged using the time-patterned approach (McAllister *et al.*, 2011). However, it is increasingly difficult to distinguish clearly between larger numbers of clusters, and the methodology is not yet fully developed for replication. Further, the use of this methodology would also limit the comparability of findings to other Canadian studies. For these reasons, we chose to use the approach developed by Kuhn & Culhane (1998) to gain a better understanding of shelter use patterns in a mid-sized city in British Columbia, Canada.

Community context

Homelessness is a significant concern in Victoria, BC, with approximately 1784 people using emergency shelters each year and 1050 homeless in a single night (Albert *et al.*, 2014; Pauly *et al.*, 2013). Victoria is a mid-sized city in western Canada with a population of approximately 344 000 people recorded in the 2011 Census (Statistics Canada, 2012). It is located on Vancouver Island and is the capital city of British Columbia. Homelessness has been identified as a high priority community issue for over 7 years (Victoria Foundation, 2013, 2014). In 2007, the City of Victoria, initiated the Mayor's Task Force on Homelessness, Mental Illness, and Addiction. The Mayor's Task Force resulted in the establishment of the Greater Victoria Coalition to End Homelessness (GVCEH) in 2008. Researchers from the University of Victoria and Simon Fraser University, in collaboration with the GVCEH, sought to analyze emergency shelter use patterns in order to advocate for more effective policies for reducing homelessness among those staying in emergency shelters in Greater Victoria, British Columbia. The key question guiding this research was: what proportion of people staying in Greater Victoria's emergency shelters over a four-year period experience temporary, episodic or long-stay homelessness?

This research was initiated as a priority project emerging from the GVCEH's collaboratively developed research agenda (Greater Victoria Coalition to End Homelessness, 2013). While this research is responsive to local research needs of the GVCEH, it also expands on empirical understandings of homeless typologies. This is one of the first studies to replicate the homeless typology cluster analysis methodology in western Canada. Results from this study have contributed to revising the GVCEH's Housing Procurement Action Plan (Elliott, 2015) to end homelessness in Victoria, BC. In this paper, we provide an overview of the methodology and findings to add to the knowledge of homeless populations in Canada and the use of cluster analysis to contribute to solutions to end homelessness.

Method

This study replicates the longitudinal cluster analysis method used by Aubry *et al.* (2013) and Kuhn & Culhane (1998). Data for this study were drawn from the Homelessness Individuals and Families Information System (HIFIS) from five adult shelters in Victoria, BC. These shelters use a bed management software program called HIFIS. Emergency shelter providers record client and bed use information in HIFIS. The administrative data in this study

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were collected from the Victoria Cool Aid Society, who operates five shelters in the City of Victoria. Ethical approval for the use of anonymized administrative data was obtained from Simon Fraser University and the University of Victoria.

Data sources

Data were obtained for the four-year period from 1 May 2010–31 May 2014 for five emergency shelters in Victoria, BC. This period was selected as it was the first time these longitudinal data were available. All but one of the adult emergency shelters in Greater Victoria were included in this study. The sixth shelter was excluded because data from this shelter were not consistently available through HIFIS as only some clients at the shelter were entered into HIFIS. Similarly, data from youth shelters, family shelters and violence against women shelters were not included in this study as the information was not available through HIFIS.

Data were anonymized by the data provider at the Victoria Cool Aid Society using an algorithm composed of letters and numbers to create a unique client identification number.

The algorithm was tested for quality to ensure it yielded the same number of unique individuals as the pre-anonymized list. Once anonymized, the data provider transferred the anonymized data to the researchers via an encrypted USB.

The HIFIS data include gender, date of birth, admission date, and discharge date for each record. After 2013, HIFIS data also includes First Nations, Inuit or Métis identification, as well as veterans status. Due to the time frame of this study, these data were not included in the analysis, as 4 years of data were not available.

The study data-set included 4332 individuals and 45 943 records of admission and discharge over the period. Seven clients (five males and two females—a total of seven records of admission and discharge) were excluded from the analysis due to a missing date of birth. A total of 4325 clients with 45 936 records of admission and discharge were included in the analysis.

Data preparation

Data preparation for this study replicated the data preparation methods of Aubry *et al.* (2013). Data were prepared through the following steps:

Identification of cases within the study period

Admissions that occurred prior to 1 May 2010 and admissions and discharges that occurred after 31 May 2014 were removed from the data file. Stays without admissions but with a discharge during the time period were included in the data file. For such files, 1 May 2010 was used as the admission date.

Restructuring of the data file

The data file was prepared for each individual's shelter use based on his or her admissions and discharges over the study period. The restructuring of the data file was completed using the unique identification code corresponding to each file. The restructured data file was used to calculate the total number of episodes and cumulative days stayed over the period. Concurrent or overlapping stays were merged into single stays.

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Categorization of age groups

Individuals' ages were categorized based on age at first admission to the shelter system. Age categories were divided into four groups: youth (15–19 years), young adult (20–39 years), middle age (40–59 years), and senior (60 years and older). Because the administrative data were from adult shelters only, the youth age category only includes youth from 15 to 19 years. Official policy dictates that adult shelters do not serve individuals under the age of 19. However, client files with ages under 19 at first admission were included in the data file, indicating that some youth were accessing the adult shelters.

Categorization by gender

Three gender groups (male, female, and transgender) were included in the analysis. The use of the gender variable in our analysis was limited by the smaller number of female and transgender files. Because the sample size in this study was significantly smaller than in the Kuhn & Culhane (1998) and Aubry *et al.* (2013) studies, analysis based on the gender variable was limited.

Creation of a total days stayed variable

A total days stayed variable was created by summing all length of stay values for all episodes of homelessness in each case over the study period, thus creating a variable that reflected cumulative number of days stayed in the shelter.

Creation of a number of episodes variable

A number of episodes variable was created to represent the total number of episodes of shelter stays over the study period. This variable was created by summing the number of times an individual was both admitted to and discharged from a shelter, or only discharged from a shelter if the admission occurred prior to the study period. Stays that were separated by less than 30 days were added together as a single stay, as being away from the shelter for less than 30 days was viewed as an indicator that the individual has not exited from the emergency shelter system. If two stays were separated by 30 days or more, they were considered two separate emergency shelter episodes in this variable. This method is consistent with the methodology of Aubry *et al.* (2013) and Kuhn & Culhane (1998).

This study does not include data on individuals experiencing homelessness outside of emergency stays. Thus, it did not include those who were exclusively sleeping outdoors, couch surfing, insecurely or inadequately housed (Canadian Homelessness Research Network, 2012). Stays with gaps of more than 30 days could imply individuals transitioning to another housing or homelessness situation outside of emergency shelter homelessness, such as becoming provisionally accommodated—couch surfing, or living in a motel for a period of time—or unsheltered—sleeping outdoors or in spaces not meant for human habitation. We recognized that emergency shelter stays may be separated not only by exits from homelessness but also by temporary transitions to other types of homeless living situations not captured in the data-set.

Creation of an average days per episode variable

An average days per episode variable was created to represent the average number of days per episode by dividing the total days variable by the total episodes variable.

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Normalizing the variables

The 'total days' and 'total episodes' variables were standardized to have a mean of zero and a standard deviation of 1 to ensure that all variables contribute evenly to a scale when items are added together (Aubry *et al.*, 2013).

Statistical analysis

The data analysis followed similar methods of analysis as Aubry *et al.* (2013). The k-means clustering method (Pollard, 1981) was used to construct unique clusters of shelter users using the standardized values of the 'total days' and 'total episodes' variables in the study. The analysis was completed using SAS 9.3 (SAS Institute, 2011). The SAS FASTCLUS procedure was used to construct the clusters.

The clusters were compared by sociodemographic variables based on information contained in the individual data-sets. Chi-square tests or Fisher's exact tests—when the sample was too small—were used to examine any statistically significant differences in the distribution of gender and age groups among the three clusters. *T*-tests were used to examine any significant differences in mean episodes, mean shelter days, and mean ages among three clusters (Woodward, 2000).

Results

The study sample consisted of 4332 individuals and 45 943 records of admission and discharge from 1 May 2010 to 31 May 2014. Using the k-means cluster analysis, three distinct clusters of shelter users were found. These clusters are: 'temporary,' i.e. staying in a shelter a few times for a limited duration, 'episodic,' i.e. staying in shelters more times for short durations, and 'long stay,' i.e. staying in shelters over long periods of time. Significant differences were found in any pairing of the three clusters. The names for these clusters is consistent with the cluster naming convention developed by Aubry *et al.* (2013), and referred to in other research (Gaetz *et al.*, 2013; Kuhn & Culhane, 1998; Segaert, 2012).

Table 1 shows the patterns of shelter stays of different clusters for clients in Victoria. As can be seen in Table 1, the temporary cluster made up 85 percent of the total sample and reflects the highest proportion of individuals in the study sample (n = 3670). This cluster had the lowest average number of episodes (M = 1.39), the lowest average days per episode (M = 17.63), and had the lowest mean total days in shelter (M = 23.61). The temporary cluster, while making up 85 percent of unique individuals in the sample, accounted for only 45 percent of occupied shelter beds over the period (n = 86,644). The minimum total days in the shelter was 1 and the maximum was 254 days. The maximum days stayed indicates the presence of outliers in the temporary cluster. The episodic cluster made up the second largest proportion of individuals in the study sample at 14 percent (n = 590). Those in the episodic cluster had the highest average number of episodes (M = 5.12), which was significantly larger than that in temporary cluster (t-test: $p < 0.001$) and in long-stay cluster (t-test: $p < 0.05$). Those in the episodic cluster had the middle average number of days per episode (M = 30.82) and the middle average total days in shelter (M = 125.59). While only accounting for 14 percent of all individuals in the sample, the episodic cluster accounted for 39 percent of all bed nights over the four-year period (n = 74,100). The long-stay cluster was the smallest cluster, making up the smallest proportion of individuals in the study

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Table 1. Patterns of shelter stays of different clusters in Victoria, British Columbia, 2010–2014.

	Cluster 1 (temporary)	Cluster 2 (episodic)	Cluster 3 (long stay)	Between cluster comparisons
Sample size	3670	590	65	
% of Clients	84.86	13.64	1.50	
Mean no of episodes (SD, MIN, MAX)	1.39 (0.68, 1, 4)	5.12 (2,10, 1, 17)	4.55 (2.89, 1, 14)	(1) Cluster 1 vs 2: $t_{(df=4258)} = -83.88, p < 0.0001 D = -3.73$ (95% CI: −3.82, −3.64) (2) Cluster 1 vs 3: $t_{(df=3733)} = -32.85, p < 0.0001 D = -3.16$ (95% CI: −3.35, −2.98) (3) Cluster 2 vs 3: $t_{(df=3735)} = 1.97, p = 0.0491 D = 0.56$ (95% CI: 0.01, 1.13)
No of episodes (%)				
1	70.90	0.51	12.31	
2	20.24	5.08	16.92	
3	7.82	11.19	16.92	
4	1.04	28.98	15.38	
5	0.00	22.37	3.08	
6	0.00	31.86	35.38	
	100.00	100.00	100.00	
Mean days (SD, MIN, MAX)	23.61 (31.49, 1, 254)	125.59 (74.20, 6, 318)	471.43 (179.73, 301, 1165)	(1) Cluster 1 vs 2: $t_{(df=4258)} = -57.19, p < 0.0001 D = -101.98$ (95% CI: −105.48, −98.49) (2) Cluster 1 vs 3: $t_{(df=3733)} = -91.54, p < 0.0001 D = -447.82$ (95% CI: −457.41, −438.23) (3) Cluster 2 vs 3: $t_{(df=653)} = -29.34, p < 0.0001 D = -345.84$ (95% CI: −368.93, −322.70)
Mean days per episode (SD)	17.63 (25.58)	30.82 (30.69)	179.61 (207.28)	(1) Cluster 1 vs 2: $t_{(df=4258)} = -11.29, p < 0.0001 D = -13.19$ (95% CI: −15.43, −10.90) (2) Cluster 1 vs 3: $t_{(df=3733)} = -34.85, p < 0.0001 D = -161.98$ (95% CI: −171.09, −152.87) (3) Cluster 2 vs 3: $t_{(df=653)} = -16.00, p < 0.0001 D = -148.79$ (95% CI: −167.05, −130.53)
% of Clients by days per episode				
1–30	82.53	64.24	0.00	
31–60	12.18	26.27	23.08	
61–90	3.19	4.41	12.31	
91+	2.10	5.08	64.62	
No. occupied shelter beds	86,644	74,100	30,643	
% of Occupied shelter beds	45.27	38.72	16.01	

sample at two percent (n = 65). This cluster had the middle average number of episodes (M = 4.55), which was significantly larger than that in temporary cluster (t-test: $p < 0.001$) (M = 1.39), though with such a long average length of stay (M = 179.61) this cluster had by far the largest average total days in the shelter (M = 471.43). Some clients had stayed in a shelter for almost the entire study period. The long-stay cluster represented only two percent of the study sample, though accounted for 16 percent of all bed nights over the four-year period (n = 30,643). In total, the episodic and long-stay cluster accounted for 55 percent of total bed night stays (n = 104,743).

Statistical analyses showed that clients stayed significantly more days (total mean and mean per episode) in the episodic cluster than in the temporary cluster (t-test: all ps < 0.001), and clients stayed significantly more days in the long-stay cluster than in both the temporary and episode clusters (t-test: all ps < 0.001).

Table 2 presents the demographic characteristics of the three clusters. Men accounted for over 70 percent of individuals in each cluster. Women accounted for 28.45 percent of individuals in the temporary, 26.61 percent in the episodic, and 29.23 percent in the long-stay cluster, respectively. There were no significant differences in gender among three clusters (Fisher's exact test: $p > 0.05$).

The mean age was 41.77 years old in episodic cluster, which was significantly higher than that in temporary cluster (40.65, t-test: $p < 0.001$). The mean age was 45.51 years old in long-stay cluster, which was significantly higher than that in both the temporary (t-test: $p < 0.05$) and episodic cluster (t-test: $p < 0.05$).

The temporary cluster had the highest proportion of young adults at 46 percent. The largest number of individuals in the temporary cluster (46 percent) were from 20–39 years old, with an average length of stay of 18 days. A similar proportion of individuals in the temporary cluster (46 percent) were from 40 to 59 years old. These individuals seem to have been able to find alternatives to staying in shelters over the period. The majority of individuals in the episodic cluster, 54 percent, were between the ages of 40–59. The long-stay cluster had the highest proportion of seniors at 14 percent. Youth were equally represented in both the temporary and long-stay clusters at three percent.

Study limitations

In this analysis, we are able to get a better understanding of the patterns of homelessness among people who used emergency shelters in Victoria at least once over the four-year period. This analysis only includes people who can and do access five of the six shelters in Victoria, BC, and does not include individuals experiencing homelessness that never stay in shelters throughout the year or that exclusively stayed in the sixth shelter not included in the analysis. Individuals may choose not to stay in shelters as they do not want to be indoors, they are banned, or they do not want to comply with the rules and structure of emergency shelters. Women in particular may choose not to stay in shelters due to fears related to safety or child apprehension.

In doing this kind of analysis, we are dependent on shelter records collected by a large number of staff, at several different sites for administrative rather than research purposes. Because staff may not see benefits in their work practices from the data analysis, they may be less concerned with data entry accuracy. Therefore, data collection may be inconsistent between sites and over time. As well, the HIFIS data-set the authors used for this study did

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Table 2. Characteristics of age and sex among clients in Victoria, 2009–2014.

Demographic characteristics	Cluster 1 (temporary)	Cluster 2 (episodic)	Cluster 3 (long stay)	Between cluster comparisons
Number of clients (%)	3670 (100.00)	590 (100.00)	65 (100.00)	
Males (%)	2614 (71.22)	430 (72.88)	46 (70.77)	
Females (%)	1044 (28.45)	157 (26.61)	19 (29.23)	
Transgender (%)	12 (0.33)	3 (0.33)	0 (0.00)	(1) Cluster 1 vs 2: $X_{(df=2)} = 1.27$, $p = 0.4656$ (Fisher's Exact test) (2) Cluster 1 vs 3: $X_{(df=2)} = 0.22$, $p = 0.9112$ (Fisher's Exact test) (3) Cluster 2 vs 3: $X_{(df=2)} = 0.51$, $p = 0.7521$ (Fisher's Exact test)
Mean age (SD)	40.65 (12.81)	41.77 (11.03)	45.41 (12.66)	(1) Cluster 1 vs 2: $t_{(df=4258)} = -2.01$, $p = 0.0442$ (2) Cluster 1 vs 3: $t_{(df=3733)} = -2.97$, $p = 0.0030$ (3) Cluster 2 vs 3: $t_{(df=653)} = -2.48$, $p = 0.0132$
Age groups				
Youth (%)	101 (2.75)	10 (1.69)	2 (3.08)	
Young adult (%)	1677 (45.69)	233 (39.49)	20 (30.77)	
Middle age (%)	1673 (45.59)	320 (54.24)	34 (52.31)	
Senior (%)	219 (5.97)	27 (4.58)	9 (13.85)	(1) Cluster 1 vs 2: $X_{(df=3)} = 16.37$, $p = 0.0009$ (2) Cluster 1 vs 3: $X_{(df=3)} = 10.28$, $p = 0.0163$ (Fisher's Exact test) (3) Cluster 2 vs 3: $X_{(df=3)} = 10.95$, $p = 0.0173$ (Fisher's Exact test)

not include information about income, mental health, substance use, or other health problems that are important to gain insight into barriers to housing and the need for supports. Cultural or ethnic background was also not available in the data-set. For example, we were not able to identify Indigenous and non-Indigenous participants. Given that Indigenous people are over-represented among those who are homeless in the region, this would be important for future analysis (Pauly *et al.*, 2013). Additionally, youth, families, and women are under-represented in this analysis as there are fewer emergency shelter beds available for these groups in the adult emergency shelters. For example, the largest shelter in the data-set, with 84 beds, has a majority of these beds dedicated for males, while the women's shelter only has 24 female dedicated beds. Youth specific emergency shelters, one adult emergency shelter and shelters for women fleeing violence were not included in the data-set as these shelters do not use HIFIS and their administrative data could not be included in the analysis. As youth-specific shelters were not included in the data-set, it is difficult to make any conclusions specific to youth. Additionally, the senior age category of 60 plus was selected for comparability of results with Aubry *et al.* (2013) paper, and because most seniors housing options are available at 60 plus. However, we recognize that this age grouping does not include all older adults experiencing homelessness, as homelessness is known to contribute to poor health and accelerated aging (Hodgetts *et al.*, 2007).

This study includes data from one small-sized western Canadian city. Analysis of clusters with small sample sizes, such as the long-stay cluster ($n = 65$), maybe less reliable than the larger temporary and episodic clusters, and less comparable to Aubry *et al.*'s (2013) analysis of larger samples in Ottawa and Toronto, Canada.

Discussion

In this replication study, three statistically significant clusters emerged similar to those in the Aubry *et al.* (2013) and Kuhn & Culhane (1998) studies. The proportion of temporary shelter use is similar to that found in Toronto, Ottawa, and Guelph. It is important to note that because there are some small numbers of people who may never access shelter or access shelters only under extreme conditions, some people included in the temporary cluster may actually be experiencing episodic or chronic homelessness.

The episodic cluster in the Aubry *et al.* (2013) study made up 10 percent of the sample and 26 percent of bed nights in Ottawa, and 8 percent of the total sample and 21 percent of bed nights in Toronto. In Victoria, the episodic group made up 14 percent of the sample and used 39 percent of bed night stays. Additionally, the mean length of stay in Toronto was higher ($M = 181$) than the episodic cluster in Victoria ($M = 126$). This may be a reflection of shelter capacity and current shelter policies that limit length of stay.

In the previous research, Kuhn & Culhane (1998) found a higher proportion of physical, mental health, and substance use problems among people in both episodic and chronic homeless clusters. They suggested that because of the episodic nature of their shelter use, individuals in this cluster may 'slip through the cracks,' and have less opportunity to access necessary health and social supports (Kuhn & Culhane, 1998). The use of HIFIS did not allow for accurate information related to mental health and substance use problems. In future studies, it would be important to obtain this type of information in order to determine if these problems differ between the temporary, episodic, and long-stay or chronic group. As well, given previous research on the impacts of homelessness, it is possible that

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people in the episodic and long-stay clusters are more likely to be experiencing poor health, including poor mental health and substance use problems, as homelessness is implicated in the development of health inequalities (Baker *et al.*, 2011; Hodgetts *et al.*, 2007).

The pattern of episodic and long-stay clusters making up a greater proportion of bed nights is consistent with the findings in Ottawa, Toronto, and Guelph. However, the long-stay cluster in the Aubry *et al.* (2013) study made up 39 percent of bed nights in Toronto and 27 percent of bed nights in Ottawa, versus 16 percent of bed nights in Victoria. This disparity is also demonstrated in the large difference between the mean number of days per episode in the Aubry *et al.* (2013) study and the present study. The long-stay cluster in Toronto and Ottawa had mean number of days per episode of 304 and 489 (Aubry *et al.*, 2013), whereas the long-stay cluster in Victoria had a mean number of days per episode of 180.

The smaller percentage of total bed nights among the long-stay cluster in Victoria is likely a result of shelter policies, as well as the lack of available beds and high incidence of turnaways at shelters in Greater Victoria (Pauly *et al.*, 2013). In Victoria, there are limitations on the maximum number of consecutive nights a person can stay in shelters. During the study period, those using emergency shelters could only stay for 30 consecutive nights at one shelter, after which they would have to have a minimum of 7 days out of the shelter. In 2012/2013, there was an average of 450 incidences of turnaway per month at just one emergency shelter in Greater Victoria (Pauly *et al.*, 2013). Individuals in Greater Victoria therefore are likely unable to stay in emergency shelters long enough to fall into the long-stay cluster, and thus are categorized in the episodic cluster. It is likely that the number of individuals falling into the long-stay cluster is an underestimate of the number of individuals who experience persistent homelessness in Greater Victoria over a long period.

There were few statistically significant gender differences among the groups. The episodic cluster however had the highest proportion of men, indicating that men may be more likely to move in and out of the emergency shelters episodically. In Victoria's emergency shelters, a majority of shelter spaces are allocated to men. Men may be more willing to leave the shelter to pursue temporary accommodation, whereas women may continue to stay in the shelter for fear of not being able to regain a bed.

Youth were equally represented in both the temporary and long-stay clusters. Young adults were the most likely to be temporarily sheltered and seem more able to quickly find new long-term housing arrangements. Middle-age individuals were the most likely to cycle in and out of the emergency shelters. Seniors were disproportionately more likely to use the emergency shelters over an extended period of time. This indicates that some seniors face particular difficulties securing housing. Overall, middle-age adults and seniors had a higher likelihood of being among those who experience episodic and chronic homelessness. Thus, experiencing the greatest difficulty exiting homelessness. In this study, we used age 60 and over as being a senior. However, it is well known that people on the street age prematurely (Hwang, 2001; McDonald *et al.*, 2009) and thus it may have been more accurate to categorize seniors at age 55 and over.

Implications

We suggest that the results of this study be used to inform solutions to homelessness in the Greater Victoria region, and for the GVCEH in particular, as well as for other communities with a focus on ending rather than managing homelessness. In addition to replicating

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the findings of Aubry *et al.* (2013), the study points to the need for a range of solutions to homelessness based on an individual's experience of temporary, episodic or chronic homelessness. Homelessness can be understood as a consequence of structural (e.g. lack of housing, inadequate income), systemic (racism, discharge into homelessness from hospital, corrections, and foster care), and individual factors (personal crisis such as illness, job loss, eviction) (Gaetz, *et al.*, 2013). The finding of the three clusters of shelter use can be used to provide support and insight into the range of solutions needed to end homelessness. If the majority of those who use shelters do so temporarily, this points to important short-term emergency solutions such as crisis grants, short-term rental assistance, and the need for rental supplements that can help bridge income and housing gaps. For those experiencing episodic and chronic homelessness, longer-term solutions such as permanent affordable housing, adequate income, mental health, and substance use supports are needed. For example, Housing First, which prioritizes the provision of permanent housing along with appropriate supports, would be a more intensive strategy appropriate for those who are episodically and chronically homeless. As evidenced by the At Home/Chez Soi Study, the success of this strategy requires an available supply of affordable permanent housing (Nelson *et al.*, 2014). Thus, prioritizing the building of social housing, and permanent and ongoing rent controls or rental supplements in market housing are needed for these groups. Additionally, assertive and intensive case management is needed for some high needs individuals experiencing episodic and chronic homelessness. A range of harm reduction services also needs to be available and/or incorporated into housing given that Housing First does not require participants to be free of drugs or alcohol (Pauly *et al.,* 2013).

Aubry *et al.* (2013) recommend focusing initially on addressing the needs of the chronically homeless. While this is an essential and compassionate intervention, it is important to note that ending homelessness for this small group will not stop the flow into homelessness or end homelessness. It will prioritize support for the worst-off to exit homelessness, but does little in terms of upstream actions to prevent the continuing flow into homelessness. In Greater Victoria, housing those who are already homeless and most in need, has not led to measureable progress in ending homelessness over time. For example, while housing providers have consistently continued to house people who are homeless, there has been little progress in reducing the number of people who use emergency shelters year-to-year (Pauly *et al.*, 2013). Upstream actions that address broader structural conditions, such as the availability and cost of housing, and shelter and income assistance rates, are key to stopping the continued flow into homelessness. A range of actions that address both upstream prevention and downstream solutions to homelessness are required.

Conclusion

The results above indicate that patterns of homelessness in Victoria, BC are comparable to the patterns found by Aubry *et al.* (2013) in Ottawa, Toronto, and Guelph, and those found by Kuhn & Culhane (1998) in New York and Philadelphia. This study contributes new knowledge by comparing patterns of homelessness in a west coast moderate climate, with patterns found in colder eastern cities in Canada and the United States. The consistency between the patterns of shelter use suggests that the perception that more people are chronically homeless in coastal British Columbia due to the availability of services and more moderate climate is groundless.

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Acknowledgment

We gratefully acknowledge the in-kind support of the Victoria Cool Aid Society and their contributions to this research, particularly that of Helma Libick, Strategic Planning and Information Analyst.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This research was supported by funding from the Greater Victoria Coalition to End Homelessness and the MITACS Accelerate Internship [grant no IT03795]. The research was also supported by administrative assistance from Simon Fraser University's School of Public Policy and the University of Victoria's Centre for Addictions Research of British Columbia.

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