Who is Reported Missing from Canadian Hospitals and Mental Health Units? An Exploratory Study

Abstract:

International literature on missing persons suggests a significant volume of missing person cases originate from hospitals and mental health units, resulting in considerable costs and resource demands on both police and health sectors (e.g., Bartholomew, Duffy, & Figgins, 2009; Sowerby & Thomas, 2017). In the Canadian context, however, very little is known about patients reported missing from these locations – a knowledge deficit with profound implications in terms of identifying and addressing risk factors that contribute to this phenomenon. The present study is one such preliminary attempt to try to fill a significant research and policy gap. We draw on data from a sample of 8,261 closed missing person reports from a Canadian municipal police service over a five-year period (2013-2018). Using multiple logistic regression, we identify, among other factors, who is most likely to be reported missing from hospitals and mental health units. Results reveal that several factors, such as mental disabilities, senility, mental illness, and addiction, are significantly related to this phenomenon. In light of these findings, we suggest that there is a need to develop comprehensive strategies and policies involving several stakeholders, such as health care and social service organizations, as well as the police.

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The phenomenon of going missing from hospitals and mental health units has been reported in the literature for decades, yet has generated significantly less scholarly attention than other types of missing person cases (Bartholomew et al., 2009; Parr & Stevenson, 2013). For instance, decades ago Niskanen, Lonnquist, Achte, and Rinte-Manty (1974) and Crammer (1984) noted increased rates of harm experienced by those who leave from hospital wards without permission, and more recently Hayden and Shalev-Greene (2018) observed cause for alarm in the professional care practices regarding patients as a large number of people go missing from these locations. High rates of individuals reported missing from hospitals and mental health facilities *should* warrant concern, as it represents a significant health issue with substantial economic, social, and health impacts (Muir-Cochrane & Mosel, 2008). Some of these effects, for example, are increases in suicide rates (Crammer, 1984; Niskanen et al., 1974), the potential for overdose deaths (Bowers et al., 2005), missed or loss of treatments (Bowers et al., 1998; Dickens & Campbell 2001), self-neglect and self-harm (Hunt, Windfuhr, Shaw, Appleby, & Kapur, 2010), loss of contact with health services, and increases in violence and aggression (Muir-Cochrane & Mosel, 2008).

Going missing from these locations also has negative consequences beyond the individual, as fears for safety can impact other patients, family members and friends, as well as service providers (Wilkie, Penney, Fernane & Simpson, 2014). For example, after a missing incident, community and family members are reported as experiencing a decreased sense of confidence in the security measures and care being provided. There is also often a heightened perception of risk to public safety after a missing incident, especially for those reported as missing from these locations due to the high incidence of mental illnesses among these cases

(Hayden & Shalev-Greene, 2018; Wilkie et al., 2014). These episodes also have adverse impacts on the health and public safety sectors involving, as they do, the consumption of time and resources that are often at a premium (Hayden & Shalev-Greene, 2018; Muir-Cochrane & Mosel, 2008). In particular, hospitals and mental health units are reported as commonly without the time, knowledge, or resources to locate the missing person (Hayden & Shalev-Greene, 2016), thereby often displacing this responsibility onto the police. As a result, the police are often the first to be called to handle such incidents. Similarly, the police in many countries, including Canada, are dealing with multiple resource demands and diminishing personnel and budgets. Missing person cases can be time intensive, and may require costly resources, such as officer time and the deployment of tracking equipment to find and return people. When we consider that police may be called to hospitals and mental health facilities multiple times due to high rates of people going missing repeatedly from these locations (Bowers, Jarret, Clark, Kiyimba, & McFarlane, 1999; Smith & Shalev Greene, 2015), we begin to see how much of a potential resource burden such cases might represent for both systems. Factoring in competing demands for police responses, we can see how some individuals who go missing or wander away might fall through the cracks.

Despite the concerns articulated above, there is a shortage of research examining who goes missing from hospitals and mental health units, what factors may lead these occurrences, and what types of cases typically make up these reports in Canada. In light of the current economic climate and rise in austerity policing (author cite), there is a need to better understand the potential risk factors and vulnerabilities related to going missing from these locations, as they require strategic partnerships with health services to develop targeted, informed interventions. Additionally, there is a complex network of personal, environmental, and situational factors that

may contribute to these incidents. As such, there is a need for research on predictive variables for going missing to forecast the duration, severity, and chances of harm related to a missing episode from hospitals and mental health units.

Aim

Given this gap in the current literature, this paper examines whether any demographic, health, and/or incident characteristics of the missing cases reported to the police from 2013 to 2018 influence the phenomenon of going missing from hospitals and mental health units. By drawing attention to these understudied cases of missing persons, we hope to provide a framework for the development of a risk assessment that identifies the probability of a person going missing from these locations, as well as offer information that may assist with producing targeted initiatives aimed at reducing the overall volume of missing person reports from hospitals and mental health units. We also seek to offer some first insights on the profile of the missing from these locations, which can help with the creation of distinguished risk profiles of who goes missing from institutional locations when compared to other location types. Thus, looking at these strong patterns of institutional contact serves as an important starting point for answering questions about who goes missing from these locations and the factors related to these incidents.

Background

Recent figures on missing people in Canada estimate there are anywhere from 70,000 to over 100,000 missing reports generated each year (Canada's Missing, 2018). Existing literature highlights that most of these are, in fact, repeat missing cases, whereby people are reported as missing to the police multiple times. Although there are no Canadian rates on how many times people go missing repeatedly, international estimates from the United States (U.S.), the United Kingdom (U.K.), and Australia highlight that repeat cases typically constitute up to 50% of all

missing person investigations. Multiple missing reports particularly occur for those cases that originate from institutional locations, such as hospitals and mental health units (Hayden & Shalev-Greene, 2018; Shalev Green & Pakes, 2013). In an Australian study linking missing person incident reports and mental health service use, Sowerby and Thomas (2017) found that people went missing six times on average from these locations, with one individual alone being reported missing 129 times. A recent study by Hayden and Shalev-Greene (2018) discovered that 84% of the repeat missing person reports were from institutional facilities, of which 54% were hospital and mental health units. Lastly, Muir-Cochrane, Oster, Drummond, Fereday, and Darbyshire (2011) found that over half of all absconding incidences were repeat cases and the most significant predictor for going missing multiple times is a previous history of eloping from institutional care. This is consistent with findings from the Meehan, Morrison, and McDougall (1999) and Bowers, Jarret, Clark, Kiyimba, and McFarlane (2000) studies. These findings suggest that not only do people go missing from hospitals and mental health facilities, a pertinent problem in-and-of-itself, but they do so frequently and multiple times. Given these findings, it is expected that *those reported as missing one to ten times will be strongly associated with going missing from these locations (Hypothesis 1)*. As well, we hypothesize that *repeat and habitual/chronic missing reports will be positively associated with going missing from hospitals and mental health units (Hypothesis 2)*.

When individuals go repeatedly missing from these locations, Rees and Lees (2005) note that it often indicates that there is something wrong with their current situation or location, and/or that they want to be somewhere else or with someone else. Given the vague reasons behind why people go missing from these locations, as well as the high incidence of reports generated, a large body of research has emerged from the U.K., U.S., and some grey literature

from Canada that identifies the various risk factors related to going missing. These include: being a vulnerable person, especially a young adult (Sowerby & Thomas, 2017; LePard, Demers, Langan, & Rossmo, 2015; Puzyreva & Loxley, 2017; Welch, 2012); having mental health problems, such as depression (Biehal, Mitchel, & Wade, 2003; Holmes, 2017; Stevenson et al., 2013); having a substance use and abuse problem (Shalev Greene, 2011); having a history of family conflict (Whitbeck, Hoyt & Yoder, 1999); and having a history of conflict with the law (Shalev Greene, 2011). Other authors have highlighted that being female (Kiepal, Carrington, & Dawson, 2012; Puzyreva & Loxley, 2017), having an Indigenous identity (Pearce, 2013), mental and physical disabilities (Pearce, 2013), and medical conditions/dependencies (Cohen et al., 2008) are all factors that are said to increase the risk of being reported as missing substantially. Specific to going missing from hospitals and mental health units, multiple studies have found that young adults and males typically go missing from these locations (Muir-Cochrane & Mosel, 2008; Bowers, Alexander, & Gaskell, 2003), and, as such, are the most at risk. Based on this, it is predicted that *young adults and males are more likely to go missing from hospitals and mental health settings (Hypothesis 3)*. Additionally, given that only one race classification was noted in the existing literature as a risk factor, we expect that *the race of the missing will not emerge as related to who goes absent from these locations (Hypothesis 4).*

To expand on the above, there is a high incidence of reported mental health issues among missing people, as previously mentioned, which is documented to range somewhere between 40% to 80% (Gibb & Woolnough, 2007; Holmes, 2017; Holmes, Woolnough, Gibb, Lee, & Crawford, 2013; Woolnough, Alys, & Pakes, 2016). One U.K. study, which interviewed people who had previously been reported missing, found that just under 85% either had a diagnosed mental health disorder or experienced undiagnosed mental health issues, with most describing

mood disorders and several psychotic disorders (Stevenson, Parr, Woolnough, & Fyfe, 2013). International literature on missing persons details that some of the common reasons for why people go missing are depression, anxiety, severe emotional distress, and issues pertaining to suicidality (Biehal et al., 2003; Foy, 2006; James, Anderson, & Putt, 2008; Sowerby & Thomas, 2017). Several studies also note that a vast majority of those who go missing suffer from substance dependency and/or addictions (Shalev Greene & Alys, 2017; Sowerby & Thomas, 2017; LePard et al., 2015), especially those who go missing from hospitals and mental health units (Muir-Cochrane & Mosel, 2008). This indicates that those with mental health and addiction issues constitute a significant proportion of missing person reports. In light of these existing findings, we hypothesize that *those documented as having a drug/alcohol dependency and mental illness/possibly suicidal are more likely to go missing from hospitals and mental health units when compared to any other documented health concern and those without health issues (Hypothesis 5)*. As shown, there is a multifaceted web of factors that may contribute to a person going missing, especially from hospitals and mental health units, which can exacerbate the problems that are related to these cases.

Despite these complexities adding challenges to missing person investigations, scholarship highlights that most missing people are found or returned within two days of being reported as missing, regardless of incident characteristics or the characteristics of the missing person (Kiepal et al., 2012; Cohen et al., 2008). Considering this, we predict that *most people who go missing from hospitals and mental health units will be found within two days, and no other categories regarding the number of days missing will be associated with the outcome variable (Hypothesis 6)*. Another convolution is the significant variance in the incident outcomes reported across existing scholarship. For example, to provide some Canadian research and grey

literature, Cohen et al. (2008) reported that, in their study, most people who went missing were classified as an accident, then suicide. In contrast, the least classified probable cause designations were parental abduction, runaways, and repeat missing persons. According to Cohen et al. (2009), most of their studied cases were noted as accidents and kidnappings, followed by being pronounced dead, unknown, suicide, and lastly, wandered off/lost. Similarly, according to Patterson (2005), the probable cause explanations of the cases from 1950 to 2004 overall were mostly an accident, followed by unknown/other, runaway, wandered off or lost, missing information, parental, and lastly, parental abduction. Finally, according to RCMP (2015), most case outcomes were unknown or foul play suspected, followed by runaway or lost/wandered off. As can be seen, most are unknown, and it is not currently possible to determine probable cause patterns. Consequently, it is expected that *most cases will have a none/unknown probable cause noted, and, subsequently, any probable cause explanations aside from none/unknown will not emerge as significantly associated with these cases (Hypothesis 7)*. Lastly, given the difficulties associated with these cases, the high rates of psychiatric illnesses, the sweeping negative consequences, and the prevalence of these cases, we expect that *cases classified as either emergency and urgent will be positively associated with going missing from hospitals and mental health units (Hypothesis 8)*.

Data and Variables

To examine these empirical predictions, we use data obtained from the record management system (RMS) of a Canadian municipal police service[1]. As part of a larger five year project aimed at improving understanding of, prevention of and response to missing persons cases,

[1] Canadian police RMS data consists of all details of an incident reported to local police. In this instance, information includes: the original occurrence report, follow up steps taken by officers, additional information acquired through interviews, and relevant case details used to construct a risk profile.

anonymized data[2] were extracted from all closed missing person reports for five years (2013 to 2018) by a crime analyst at the agency, who provided a total of 8,519 reports concerning missing persons. Due to a small number of cases having missing data, we used listwise deletion on the included variables, whereby cases were removed if there were any missing values. This resulted in a final sample of 8,261 individual records of missing persons.

Dependent Variable

To measure who goes missing from hospitals and mental health units, we use the location type documented by the police service in the RMS (i.e., retirement home, school, etc.). From this, we generated a binary dummy variable representing whether a person had gone missing from a hospital or mental health setting, where 0 = not missing from a hospital or mental health unit and 1 = missing from a hospital or mental health unit. To account for potential discrepancies in the classification of places, we verified the coding by cross-referencing addresses one was reported as missing from with the hospital and mental health unit addresses within the city in which the police service is situated.

Independent Variables

For missing person characteristics, we include the following demographic predictors: *race*, *age group*, and *gender*. For *health information,* we incorporate any documented health-related concerns, issues, or statements throughout the 'remarks' and 'synopsis' sections of the data, as well as any RMS-generated variables. Lastly, for incident characteristics, we only include the *probable cause*, *history*, if they were *reported missing before*, the *assigned urgency level*, and the *number of previous missing reports*.

[2] All data were collected and handled in accordance with guidelines established by the Canadian Tri-Council Agencies and our University's Research Ethics Board, from which we had received approval to conduct this research. Further, the results of this study were reviewed by the police service, which had granted us approval to study their data pursuant to a signed Memorandum of Understanding that included guidelines as to maintaining confidentiality.

Concerning demographic information, the missing person's *race* was coded based on the categories of White, Aboriginal (Indigenous peoples), Black, and Other. This latter group was created by collapsing those racial categories with smaller sample sizes, such as Asian, Middle Eastern, and East Indian, into one variable. A dummy variable for *gender* was created, where 0 = male and 1 = female. A limitation of this data is that an individual's exact age is not noted, so the age of each missing person is not known. Instead, their age was reported as within a range. Adult age categories (aged 22 and above) were coded just as they were created by the RMS, which involved the following groups: 22 to 29 years, 30 to 49 years, 50 to 65 years, and over 65 years. However, for youth, alterations were made for the youngest age groupings. For those aged eight years and younger, the three original categories (0 to 3 years, 4 to 5 years, and 6 to 8 years) were collapsed into one category: 0 to 8 years. This was performed as there were very little reports generated within this age range, and keeping the existing categories resulted in too small of a sample size to produce reliable and stable results. The remaining age groups are 9 to 11 years, 12 to 13 years, 14 to 15 years, 16 to 17 years, and 18 to 21 years.

Examining the data revealed several variables pertaining to the missing individual's health, such as comments related to alcoholism, drug use, mental illnesses, and/or Alzheimer's. *Health information* was coded according to the following classifications: drug/alcohol dependency (e.g., 'drug abuser' or 'alcoholic'); medical dependency (e.g., 'diabetic, needs insulin'); mental disability/senile (e.g., 'brain injury – low/no functioning' or 'suffers from severe dementia'); mental illness/possibly suicidal (e.g., 'suicidal note left' or 'ADHD and defiant disorder'); other (e.g., 'is 7.5 months pregnant'); and none reported.

Lastly, we include incident characteristics that inform on the types of cases that this dataset consists of. These involve *probable cause* explanations, which are the reasons noted for

why the person was reported as missing. This produced three categories: runaway, wandered off/lost, and other (i.e., 'suspected on vacation,' 'misunderstanding,' etc.). *History* was coded based on the three RMS-generated categories of a missing individual's history, which are: no previous history, repeat, and habitual/chronic[3]. For *reported missing before*, we created a dummy variable on the number of previously reported missing reports documented in this dataset, where 0 = no (not previously missing) and 1 = yes (previously missing). The *urgency level* assigned by the police service was coded as non-emergency, emergency, and urgent. Lastly, *previous missing count* involved the creation of a continuous variable to examine if there is a tipping point at which the number of prior reports a missing individual has makes them more likely to go missing from these locations. This occurred as leaving the variable as continuous produced too many observations and did not allow each count to have a different relationship to the outcome. Through this, the following classifications emerged: 1 to 10 reports, 11 to 20 reports, 21 to 30 reports, 31 to 40 reports, 41 to 50 reports, and over 50 reports.

Models

This study employs multiple logistic regression to analyze who is more likely to go missing from hospitals and mental health units. Logistic regression is appropriate when the dependent variable involves bounded, dichotomized categories. As such, the use of this model was selected given that the dependent variable in the analysis is binary in nature and utilizing a linear probability model violates standard OLS assumptions. For a missing person *i*, the full model estimating the probability of going missing from hospitals and mental health units is:

$$\log \frac{\pi\,(missing\ from\ hospitals\ and\ mental\ health\ units)_i}{1-\pi\,(missing\ from\ hospitals\ and\ mental\ health\ units)_i} = \beta_0 + \beta \boldsymbol{x}'_i + \beta \boldsymbol{z}'_i + \varepsilon_i,$$

[3] In using this language, we are replicating the categories found within the RMS data. In other words, 'runaway', 'habitual', and so on, are how the officers responding to these cases classified the incident based on their knowledge of the case.

where $\beta \boldsymbol{x}'_{\boldsymbol{i}}$ represents the set missing person characteristics controls added, $\beta \boldsymbol{z}'_{\boldsymbol{i}}$ signifies the set of incident controls included, and ε_i captures residual variation. Below we analyze two types of models: first, models split by the missing person and incident characteristics of the missing cases to provide baseline estimates, and second, a model estimated on all the predictors. That is, one model examines the likelihood of going missing from hospitals and mental health units regarding those characteristics specific to the person reported as missing, the second explores the incident characteristics, and the final model is estimated on all of the previously mentioned covariates. The purpose of this is first to provide baseline estimates on *who* is the most at-risk of going missing from these locations, then to show what *types of cases* are the most likely. Then, after this, to provide information on the relationship between all of the predictors to the outcome. Results from this analysis will be useful for informing targeted risk assessments that can help with developing more fiscally efficient approaches to dealing with the missing from these locations, as well as providing evidence to inform prevention and collaboration strategies better.

Results

Descriptive Information

Table 1 presents a descriptive overview of the missing person and incident characteristics of all closed missing person cases from 2013 to 2018. As shown, those who are White make up 71.0% of these cases, with Indigenous people being the second most frequently recorded at 14.8%. That said, the latter group is disproportionality represented given that Indigenous persons only account for about 2.97% of the population in this city (Statistics Canada, 2016) and 2.6% of the Canadian population (Statistics Canada, 2011). Both genders were generally accounted for, with females signifying 56.5% of these cases. With respect to age, the majority of reports fall within the 14 to 15 years (n = 2274; 27.5%) and 16 to 17 years (n = 2647; 32.0%) groups, with 30 to 49

years being the next most represented at 11.8% (n = 975). Lastly, the majority of cases have no and/or unknown health issues (n = 6081; 73.6%), followed by mental disabilities and senility (n = 951; 11.5%).

Turning to the incident characteristics, 11.4% of these cases went missing from hospitals and mental health units (n = 942), in contrast to the 88.6% that did not (n = 7319). A large majority were reported as running away (n = 5796; 70.2%), which suggests that police frequently viewed individuals as leaving these locations intentionally. Most were reported as habitual/chronic (n = 4460; 54.0%) and as going missing previously between 1 to 10 times (n = 5401; 65.4%). The urgency level assigned to the majority of cases was non-emergency (n = 7654; 92.6%), with very little being classified as emergencies (n = 228; 2.8%) or urgent (n = 379; 10.7%). Lastly, most cases were closed within two days (n = 6594; 79.8%), with the next most represented group being three to five days (n = 855; 10.3%).

Table 1. Descriptive Overview of Who Goes Missing From Hospitals and Mental Health Units, 2013 to 2018 (N = 8261)

Variable	Frequency (%)	Variable	Frequency (%)
Missing Person Characteristics		*Incident Characteristics*	
Demographic		Missing from Hospital Care	
Race		Yes	942 (11.4)
White	5863 (71.0)	No	7319 (88.6)
Aboriginal	1224 (14.8)		
Black	471 (5.7)	Probable Cause	
Other	703 (8.5)	Runaway	5796 (70.2)
		Wandered Off/Lost	359 (4.3)
Gender		Other	683 (8.3)
Male	3595 (43.5)	None/Unknown	1423 (17.2)
Female	4666 (56.5)		
		History	
Age Group (Years)		No Previous History	1861 (22.5)
0 to 8	130 (1.6)	Repeat	1940 (23.5)
9 to 11	198 (2.4)	Habitual/Chronic	4460 (54.0)
12 to 13	349 (4.2)		
14 to 15	2274 (27.5)	Previous Missing Count	
16 to 17	2647 (32.0)	1 to 10	5401 (65.4)
18 to 21	334 (4.1)	11 to 20	1080 (13.1)
22 to 29	713 (8.7)	21 to 30	654 (7.9)
30 to 49	975 (11.8)	31 to 40	394 (4.8)

50 to 65	352 (4.3)	41 to 50	252 (3.1)
Over 65	289 (3.5)	Over 50	480 (5.8)
Health		Assigned Urgency Level	
Health Information		Non-Emergency	7654 (92.6)
Drug/Alcohol Dependency	513 (6.2)	Emergency	228 (2.8)
Medical Dependency	107 (1.3)	Urgent	379 (4.6)
Mental Disability/Senile	951 (11.5)		
Possibly Suicidal/Mental Illness	259 (3.1)	Number of Days Missing	
Other	350 (4.2)	0 to 2 days	6594 (79.8)
None	6081 (73.6)	3 to 5 days	855 (10.3)
		6 to 8 days	315 (3.8)
		9 to 11 days	103 (1.2)
		Over 11 days	394 (4.8)

Going Missing from Hospitals and Mental Health Units

Table 2 displays the estimates of three logistic regression models. Model 1 uses only those characteristics of the missing individual for each case. Model 2 represents the inclusion of just the incident characteristics pertaining to each report. Lastly, in Model 3, all of the predictor variables are added to fully estimate who is more likely to go missing from hospitals and mental health units when compared to other location types.

Model 1 reveals that those with health-related issues are the most likely to go missing from hospital and mental health care sites, as well as those who are older. As shown, those who are reported as drug/alcohol dependent, senile, and/or as having a mental disability, having a mental illness and/or being possibly suicidal, and other health-related concerns all increase the odds of being reported as missing from these locations. Similarly, for every one-year increase in age, the chances of being reported from hospitals and mental health settings increases by 1.613. That is, older adults have the highest likelihood of being reported as missing from these sites. In contrast, females, when compared to males, and other racial classifications, when compared to White individuals, are significantly less likely to go missing from these locations. To expand on this, females are 0.564 times or 43.6% less likely to be reported as missing from hospitals and

mental health facilities in comparison to males. Those classified under the "other" race category, such as Asian and Middle Eastern, are also significantly associated with the likelihood of going missing these sites, whereby those in this group are 0.540 times or 46.0% less likely when compared to White missing people.

Model 2 only includes the incident characteristics regarding the missing from hospitals and mental health units that might be expected to predict the chances of going missing from these places. As can be seen, other probable cause explanations, such as ‘misunderstanding,’ are significantly more likely to go missing from hospitals and mental health units when compared to unknown reasons. Otherwise, the chances of going missing from these places are significantly less for the cases that are habitual/chronic missing people and are classified as emergency cases.

In Model 3, all of the variables expected to predict the chances of going missing from hospitals and mental health units are added. Most race classifications did not emerge as significant, with the exception of “other” being 0.628 times or 37.2% significantly less likely to go missing from these sites. This finding supports Hypothesis 4. That is, one’s race does not affect the chances of going missing from these locations when controlling for the other variables. Regarding gender, females are 0.549 times or 45.1% significantly less likely to go missing from these locations when compared to males. Age is positively associated with these incidents, whereby every one-year increase in age translates to a 2.289 or 128.9% increase in the chances of going missing from hospitals and mental health facilities. This suggests that males and older adults are more likely to go missing from these sites, which indicates that Hypothesis 3 is only partially supported. Most notably, the individual’s health characteristics remained the strongest predictors of going missing from these locations across the models. To expand on this, those with a mental disability/senility are 6.060 times or 506.0% significantly more likely to go

missing from these places, followed by mental illness/possibly suicidal (4.954 times or 395.4%) and drug/alcohol dependency (3.258 times or 225.8%). Thus, Hypothesis 5 is not supported, given that mental disabilities and senility are the strongest predictors of going missing from hospitals and mental health units. This may be explained by the global population aging, whereby there are a growing number of adults with cognitive impairments, such as dementia (Woolnough, Alys, & Pakes 2017).

Regarding the incident characteristics, the relationship of the probable cause variable to going missing is inconsistent with Hypothesis 7. That is, those reported as running away are 2.745 times or 174.5% more likely to missing from hospitals and mental health units when controlling for the other predictors, followed by 'other' probable cause explanations at 1.566 times or 56.6% more likely. This highlights that people are significantly more likely to be seen by police as intentionally leaving from these places than wandering off, getting lost, and/or other related explanations. As Hypothesis 2 predicts, those reported as repeat or habitual/chronic missing persons are both significantly more likely to go missing from these places when compared to those with no previous history of going missing. What this suggests is that people are predicted to be reported missing multiple times from these locations. Consistent with Hypothesis 1, those who go missing more than ten times are significantly less likely than those reported as missing one to ten times to go missing from hospitals and mental health units. However, despite the significant relationship of mental disabilities, mental illnesses, addiction, and multiple reports to these locations, these cases are significantly less likely to be reported as either emergency or urgent when compared to non-emergency cases. This highlights that they are more likely to be reported as non-emergency, which is surprising given the above findings and previously discussed complexities. Resultantly, Hypothesis 8 is not supported. Lastly, cases that

are not closed (i.e., located and returned) within zero to two days are not significantly related to the chances of going missing from hospitals or mental health units, which supports Hypothesis 6. This suggests that those who are reported as missing are predicted to return or be returned to hospitals or mental health facilities within 48 hours.

Table 2. Logistic Regression Models Predicting Who Goes Missing From Hospitals and Mental Health Units

	Model 1	Model 2	Model 3
Race *(Ref = White)*			
Aboriginal	1.016		0.948
	(0.134)		(0.144)
Black	1.031		0.850
	(0.188)		(0.188)
Other	0.562***		0.628*
	(0.091)		(0.118)
Female	0.560***		0.549***
	(0.048)		(0.054)
Age *(Years)*	1.609***		2.201***
	(0.039)		(0.083)
Health Information *(Ref = None)*			
Drug/Alcohol Dependency	4.766***		3.511***
	(0.609)		(0.514)
Medical Dependency	1.811*		1.707†
	(0.518)		(0.550)
Mental Disability/Senile	6.248***		6.930***
	(0.678)		(0.886)
Mental Illness/Possibly Suicidal	5.103***		5.613***
	(0.871)		(1.141)
Other	2.318***		2.184***
	(0.418)		(0.451)
Probable Cause *(Ref = None/Unknown)*			
Runaway		1.057	2.580***
		(0.111)	(0.333)
Wandered Off/Lost		1.173	0.323***
		(0.247)	(0.080)
Other		1.855***	1.593**
		(0.261)	(0.269)
History *(Ref = None)*			

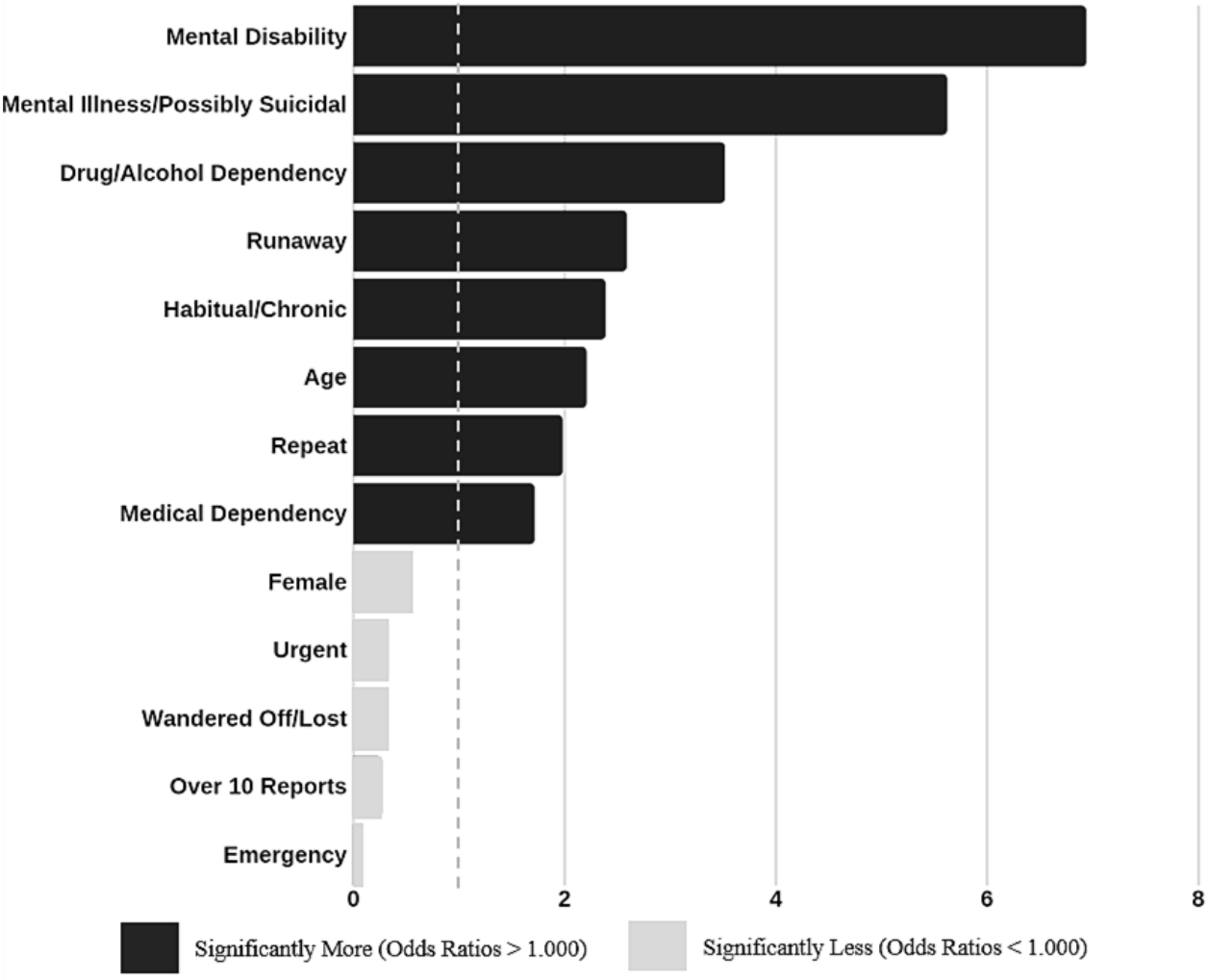
Repeat		1.398**	1.974***
		(0.142)	(0.245)
Habitual/Chronic		0.801	2.380***
		(0.801)	(0.341)
Urgency Level *(Ref = Non-Emergency)*			
Emergency		0.329***	0.082***
		(0.106)	(0.030)
Urgent		1.124	0.325***
		(0.175)	(0.062)
Previous Missing Count *(Ref = 1 to 10 Reports)*			
11 to 20 Reports		0.708**	1.207†
		(0.090)	(0.196)
21 to 30 Reports		0.146***	0.261***
		(0.044)	(0.089)
31 to 40 Reports		0.040***	0.129**
		(0.028)	(0.093)
41 to 50 Reports		0.032***	0.095*
		(0.032)	(0.096)
Over 50 Reports		0.032***	0.100***
		(0.023)	(0.072)
Number of Days Missing *(Ref = 0 to 2 Days)*		1.041	0.977
		(0.040)	(0.046)
Constant	0.004***	0.141***	0.002***
Log likelihood	-2016.596	-2293.693	-1511.074
Pseudo R-squared	0.305	0.085	0.397
Number of Observations	8261	8261	8261

Note: Standard errors are in parentheses below parameter estimates. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Figure 1 presents a visual representation of the significant coefficients in Model 3 to explore whether the missing person or incident characteristics are more likely to influence the incidence of going missing from hospitals and mental health units. It appears as though that when controlling for the incident covariates, the missing person characteristics are more likely to predict missing incidents from these locations. However, producing targeted interventions aimed at reducing the overall volume of reports based on specific missing people would not be sufficient, given that several incident covariates are also significantly associated with the chances

of going missing from hospitals and mental health units. That is, risk assessments and future strategies should not only take into consideration those who have been identified as at a higher risk of going missing from these sites (e.g., those who are older, drug/alcohol dependent, have a mental disability and/or are senile, and have a mental illness and/or are possibly suicidal), but also should consider the incident characteristics that are at an increased risk (e.g., runaways and repeat and habitual/chronic missing persons).

Figure 1. Visual Presentation of Reporting Odds Ratios for Factors Significantly Related to Going Missing from Hospitals and Mental Health Units



Discussion

There is a critical need for research on the locations from which people go missing. Why? In the instant case, baseline knowledge on rates of missing incidents from hospitals and mental health units and related factors can help both the police and health sectors develop more effective strategies to prevent future missing incidents and to identify specific individuals and/or cases to monitor. As there is very little research on this topic available, specifically in Canada, the present study attempts to identify the factors which affect the phenomenon of going missing from hospitals and mental health units. For this purpose, we utilized data gathered by a municipal police agency in Canada on individual's reported missing between the years of 2013 to 2018. The sample consisted of all missing reports over this period of time, which produced 8,219 individual missing cases.

Results from the multiple logistic regression models identified that missing person characteristics are more likely to influence the chances of going missing from hospitals and mental health units and found several key factors significantly associated with these missing incidents. Findings revealed that females, older adults, runaways (i.e., those viewed as missing intentionally), and repeat and habitual/chronic missing persons are at a higher risk of going missing from these locations. Most notably, it was also discovered that all documented health-related concerns, such as mental disabilities and senility and drug and alcohol dependency, significantly influenced this phenomenon. In other words, those with these particular health-related issues are the most at-risk for going missing from these locations as opposed to individuals with other types of health concerns (i.e., being treated for cancer or other serious/chronic illnesses[4]). These findings highlight cause for concern regarding the handling of

[4] A separate qualitative study of this same data by the authors reveals that in a small fraction of selected cases, individuals do abscond from hospitals as a result of stressors linked to significant health issues – most notably over

persons in the care of hospitals and mental health units as most suffer and live with health concerns yet are going missing intentionally from these locations and are more likely to do so multiple times. Thus, there is a significant incentive to improve the current rates of going missing from these locations. In essence, we need better strategies, interventions/preventions, and policies to address these issues, which requires collaboration, education, and strategic partnerships. Given the scarcity of research on this phenomenon in Canada, it would be instructive to explore the measures taken by other countries to deal with the issue of missing reports generated from hospitals and mental health units.

Despite the urgency to address missing person incidents, Hayden and Shalev Greene (2018) assert there is a general lack of policy or protocols regarding situations involving vulnerable persons who are at risk of going missing. In the case of people missing from hospitals, these authors question the level of responsibility assigned to the hospital versus the police and suggest that there be clear guidelines regarding the role of all stakeholders in dealing with missing patients. This is because every case assigned to the police without the care facility attempting to locate the individual is likely to strain police resources. What the findings of our study indicate is that a large proportion of missing incidents from hospitals and mental health units intersect with factors related to vulnerability (i.e., the elderly and health issues), which signifies that current professional practices need to be improved to see a reduction in these incidents. Police investment in collaborating with health providers on such strategies would significantly help to reduce their call volume, while simultaneously reducing stress and time also spent by health practitioners in making such reports. As discussed by Hayden and Shalev Greene (2018), education and communication between services, generating an informed risk assessment

actual or potential cancer and HIV diagnoses and treatment (author cite). However, as both that research and the present study make clear, such cases are generally the exception.

with health and care providers, and collaborating on more productive use of police resources, may address this phenomenon. That said, we need to be clear: the most important benefits, however, are for those vulnerable and at risk people, who might otherwise come to harm.

In terms of how to begin constructing such strategies, for health services, existing research identifies several ways in which missing person incidents from hospitals can be avoided, such as by ensuring the security of patients with mental illnesses (Bowers et al., 1999) and taking further precautionary measures (i.e., erecting high perimeter fences). These measures could, however, run the risk further exacerbating the negative consequences associated with these situations (Bowers, 2007). Similar to a preceding suggestion for the police, ensuring staff roles within these institutions are clear, as well as making sure they are experienced with and trained in handling people with the issues found to be related to going missing from these locations (i.e., senility and mental illness), can also assist with this phenomenon. Moreover, staff can provide a safe, nurturing environment, as well as relay an understanding to the person for why they are there (Hayden & Shalev-Greene, 2018; Muir-Cochrane & Mosel, 2008). Through this, the issue of absconding due to misunderstandings and wanting to escape could be reduced.

Providing patients with psychosocial support by staff and other practitioners may also be more effective in lowering missing incidents. Research suggests that such assistance is particularly crucial for patients at the time of admission (Bartholomew et al., 2009; Hunt et al., 2010). In the U.K, joint protocols developed by police and health services that address this recommendation have been mostly successful in preventing missing incidents of patients with mental health issues (Shalev Greene & Alys, 2017). Targeted follow-up of sensitive cases and establishing standard practices of conducting return interviews with missing persons are also considered effective measures in dealing with these cases (ACPO, 2010). Supporting agencies

can play an essential role in preventing missing person incidents by monitoring signals that may indicate a potential to go missing (Holmes, 2017). As well, providing vulnerable and at risk adults with information regarding support services in case they do leave helps ensure their safety and eventual return. In the U.K., the Missing Persons Bureau framework and the 2009 National Mental Health Development Board Toolkit are resources that help and assess such individuals in need of support and may serve as examples of what can be introduced in Canada (Bartholomew et al., 2009).

In Australia, a preventive approach has been adopted to develop a plan of action for missing person incidents, especially repeat cases and those who go missing from hospitals and mental health units. The framework integrates the public health model with criminal justice, and crime prevention approaches to develop a collaborative model, including all stakeholders (James et al., 2008). Using an evidence-based approach, the public health model starts with defining the problem, identifying causes, testing ways to deal with the issue, and applying measures that work. The interventions developed are primary, secondary, and tertiary and involve community engagement. Primary or universal intervention is not targeted to any specific group and includes all members of the general public, such as running media campaigns for public awareness or school curricula. Secondary interventions are more focused on potential at-risk groups, such as families of individuals displaying risk factors. Tertiary interventions are targeted towards individuals with a history of going missing to prevent further occurrences (James et al., 2008). Another vital measure likely to prevent missing persons is to conduct post-return interviews with missing persons and their families to understand the reasons for going missing and their experiences during that time. Such explanations would help develop preventive strategies and

identify the type of support needed to deal with the problem of repeat missing persons (James et al., 2008).

Overall, much more needs to be done to prevent and reduce the high incidence in the missing reports generated from hospitals and mental health units. By utilizing the information found in this study and previous literature, police agencies and health services in Canada are provided evidence that suggests which individuals should be targeted for interventions due to their likelihood of going missing from these locations.

Limitations

The present study has some limitations that must be acknowledged. First, our data does not allow us to address the issue of causality in any type of meaningful way. Future research focusing more specifically on individuals who have been reported missing is clearly needed. Second, there are several missing values which were excluded through listwise deletion, and, as a result, these data were not utilized in the dataset. Third, data were only available for the last five years as this is the maximum data retention period for this file type, which did not allow analysis over an extended period. Another notable limitation is that hospital locations and mental health units were coded as the same by the service we obtained this data from, which has important implications for the findings. For instance, we are unable to differentiate the results for each respective location as they are regarded as the same within this study. Future research would benefit from examining predictive factors for each location. Finally, we obtained data from only one police agency, which may prevent us from generalizing our findings to other regions in Canada and elsewhere in the world. While this may be the case, our results align with previous literature, which suggests that these findings show significant patterns that do not occur by

chance alone. Future studies would benefit from including data across Canada and possibly other countries to establish a comparison and generalizability of findings.

Conclusion

As persons going missing from hospitals and mental health units can place strains on the resources of health services and police, more research is required in this area to design effective strategies and measures to prevent such occurrences. The present study is one such preliminary attempt to try to fill a significant research and policy gap. The results reveal the importance of several factors, such as age and mental illness and addictions, as they have been found to have a significant impact on missing incidents from hospitals. Since there appears to be a strong relationship between health-related issues, specifically mental disabilities, senility, mental illnesses, and addiction, to the incidence of going missing from hospitals and mental health units, concrete efforts are required to address this issue. There is a need to develop comprehensive strategies and policies involving several stakeholders, such as health care and social service organizations, as well as the police. Such measures would enable police organizations to free up resources assigned to these occurrences and develop more practical and effective solutions with the help of experts in the field.

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