



URBAN PUBLIC HEALTH NETWORK
RÉSEAU POUR LA SANTÉ PUBLIQUE URBAIN

APRIL 2022

Defining Frequent Emergency Room Use in Canada

A Flash Review

AUTHOR:

Sharalynn Missiuna



The UPHN is a national organization established in 2004 which today includes the Medical Officers of Health in 24 of Canada's large urban centres. Working collaboratively and with a collective voice, the network addresses public health issues that are common to urban populations. Research operations of the UPHN are conducted in partnership with the University of Saskatchewan.

UPHN flash reviews are for discussion and comment purposes. They have not been peer reviewed nor been subject to review by the UPHN members or executive.

Any opinions expressed in this paper are those of the author(s) and not those of the UPHN.

© 2022 Authors. All rights reserved.



Defining Frequent Emergency Room Use in Canada: A Flash Review¹²³

Sharalynn Missiuna

Medical Student, University of Saskatchewan

¹ Correspondence: Dr. Cory Neudorf, Urban Public Health Network Research Group, 107 Wiggins Road University of Saskatchewan, Saskatoon, Saskatchewan, E-mail: cory.neudorf@usask.ca

² Acknowledgements: This paper was reviewed by Charles Plante and Thilina Bandara. This project was funded in part by the Urban Public Health Network. The authors declare that they have no conflict of interest.

³ Suggested Citation: Sharalynn Missiuna. 2022. "Defining Frequent Emergency Room Use in Canada: A Flash Review." Urban Public Health Network Flash Review Series. Retrieved from <https://research-groups.usask.ca/uphnresearch/publications/uphn-research-publications.php#FlashReviews>.

Defining Frequent Emergency Room Use in Canada: A Flash Review

Keywords

emergency medicine, review, analysis, patient admissions

Question

Frequent emergency room(ER) users are a common occurrence throughout Canada and contribute to crowded and overcapacity hospitals as well as heightened system-wide costs.¹⁻³ Adapting services or policies to reduce the number of frequent ER users may decrease the overall number of visits, improve patient care and help to alleviate some of the strain on Canada's overburdened healthcare system.⁴⁻⁷ However, although "frequent user" is a term understood by providers, "frequent" is not well defined operationally in the literature. A consistent definition is needed to investigate frequent users effectively. In this flash review, we answer the question: what defines frequent use in emergency rooms in Canada? Based on prior literature, it describes the methods that Canadian researchers have previously used and suggests a definition to use going forward.

Review/search strategy

We used the database PubMed and searched for papers that contained the terms "heavy use*" or "repeat use*" or "frequent use*" and "emergency" and "Canada" in their title or abstract. At the time of this writing (early 2022), the search produced 41 articles, which we screened for relevance. We found 16 articles that described characteristics of frequent ER users in Canada or included a definition of frequent ER users and were published using Canadian data. We extracted the study type, location, data source, years studied, method used to calculate frequent use, and an explanation for why the method was chosen. Finally, we evaluated the methods used and decided on a preferred definition.

Findings

The 16 articles utilized a variety of ways to define frequent. In general, articles used a cut-off percentile (the top 1% or 10% of ER users) or a set number of visits (over a certain number of visits to the ER per year). The most common cut-offs used were 3 visits/ year (3 articles),^{8,9} 4 visits/year (2 articles)¹⁰⁻¹² and the top 10% of users (4 articles).¹³⁻¹⁶ Other articles used 10+ visits/ year,¹⁷ 12+ visits/year,¹⁸ 15+ visits/year,¹⁹ the top 1% of visits,^{20,21} the top 5% of users,²² and a mix of methods.²³ CIHI defines frequent ER use as the top 10% of users, in line with their data from the National Ambulatory Care Reporting System.²⁴ There is no documentation on why CIHI chose the 10% cut-off. A few studies offered an explanation beyond prior literature for their choice of cut-off, these explanations included physician recognizability,¹⁸ frequency distribution,^{8,22} and patient characteristic differences.^{19,23} A full listing and summary of how each paper operationalized frequent ER use is provided in [Appendix A](#) .

Conclusions and recommendations

We suggest defining frequent ER users as individuals in the 90th percentile of users. This terminology aligns with CIHI's definition of frequent use²⁴ and is the most used cut-off in Canadian research. Additionally, we agree with Moe et al's²² rationale in that the distribution-based definition allows for a more accurate comparison between institutions. When

additional differentiators are required, we suggest defining highly frequent ER users as users in the 95th percentile and the highest frequency ER users as the 99th percentile of users.

References

1. Anderson M, Revie CW, Quail JM, Wodchis W, de Oliveira C, Osman M, et al. The effect of socio-demographic factors on mental health and addiction high-cost use: a retrospective, population-based study in Saskatchewan. *Can J Public Health*. 2018 Dec;109(5-6):810–20.
2. Canada: health system review 2020 [Internet]. [cited 2022 Apr 19]. Available from: <https://eurohealthobservatory.who.int/publications/i/canada-health-system-review-2020>
3. Foley M, Kifaieh N, Mallon WK. Financial impact of emergency department crowding. *West J Emerg Med*. 2011 May;12(2):192–7.
4. Ouyang H, Wang J, Sun Z, Lang E. The impact of emergency department crowding on admission decisions and patient outcomes. *Am J Emerg Med*. 2022 Jan;51:163–8.
5. Ben-Yakov M, Kapral MK, Fang J, Li S, Vermeulen MJ, Schull MJ. The Association Between Emergency Department Crowding and the Disposition of Patients With Transient Ischemic Attack or Minor Stroke. *Acad Emerg Med*. 2015 Oct;22(10):1145–54.
6. Kreindler S, Aboud Z, Hastings S, Winters S, Johnson K, Mallinson S, et al. How Do Health Systems Address Patient Flow When Services Are Misaligned With Population Needs? A Qualitative Study. *Int J Health Policy Manag* [Internet]. 2021 Apr 26; Available from: <http://dx.doi.org/10.34172/ijhpm.2021.36>
7. Finamore SR, Turris SA. Shortening the wait: a strategy to reduce waiting times in the emergency department. *J Emerg Nurs*. 2009 Nov;35(6):509–14.
8. Hudon C, Courteau J, Krieg C, Vanasse A. Factors associated with chronic frequent emergency department utilization in a population with diabetes living in metropolitan areas: a population-based retrospective cohort study. *BMC Health Serv Res*. 2017 Aug 4;17(1):525.
9. Moe J, O’Sullivan F, McGregor MJ, Schull MJ, Dong K, Holroyd BR, et al. Characteristics of frequent emergency department users in British Columbia, Canada: a retrospective analysis. *CMAJ Open*. 2021 Jan;9(1):E134–41.
10. Dufour I, Chiu Y, Courteau J, Chouinard M-C, Dubuc N, Hudon C. Frequent emergency department use by older adults with ambulatory care sensitive conditions: A population-based cohort study. *Geriatr Gerontol Int*. 2020 Apr;20(4):317–23.
11. Dufour I, Dubuc N, Chouinard M-C, Chiu Y, Courteau J, Hudon C. Profiles of Frequent Geriatric Users of Emergency Departments: A Latent Class Analysis. *J Am Geriatr Soc*. 2021 Mar;69(3):753–61.
12. Gruneir A, Cigsar C, Wang X, Newman A, Bronskill SE, Anderson GM, et al. Repeat emergency department visits by nursing home residents: a cohort study using health administrative data. *BMC Geriatr*. 2018 Jul 5;18(1):157.
13. Chambers C, Chiu S, Katic M, Kiss A, Redelmeier DA, Levinson W, et al. High Utilizers of Emergency Health Services in a Population-Based Cohort of Homeless Adults. *Am J Public Health*. 2013 Dec 1;103(S2):S302–10.
14. Chen A, Ospina M, McRae A, McLane P, Hu XJ, Fielding S, et al. Characteristics of frequent users of emergency departments in Alberta and Ontario, Canada: an administrative data study. *CJEM*. 2021 Mar;23(2):206–13.
15. Rosychuk RJ, Chen A, McRae A, McLane P, Ospina MB, Stang AS. Characteristics of Pediatric Frequent Users of Emergency Departments in Alberta and Ontario. *Pediatr Emerg*

- Care [Internet]. 2021 Nov 10; Available from:
<http://dx.doi.org/10.1097/PEC.0000000000002569>
16. Chen A, Fielding S, Hu XJ, McLane P, McRae A, Ospina M, et al. Frequent users of emergency departments and patient flow in Alberta and Ontario, Canada: an administrative data study. *BMC Health Serv Res*. 2020 Oct 12;20(1):938.
 17. Meng X, Muggli T, Baetz M, D'Arcy C. Disordered lives: Life circumstances and clinical characteristics of very frequent users of emergency departments for primary mental health complaints. *Psychiatry Res*. 2017 Jun;252:9–15.
 18. Chan BTB, Ovens HJ. Frequent users of emergency departments. Do they also use family physicians' services? *Can Fam Physician*. 2002 Oct;48:1654–60.
 19. Geurts J, Palatnick W, Strome T, Sutherland KA, Weldon E. Frequent users of an inner-city emergency department. *CJEM*. 2012 Sep;14(5):306–13.
 20. Shergill Y, Rice D, Smyth C, Tremblay S, Nelli J, Small R, et al. Characteristics of frequent users of the emergency department with chronic pain. *CJEM*. 2020 May;22(3):350–8.
 21. Kim J, Kwok E, Cook O, Calder L. Characterizing Highly Frequent Users of a Large Canadian Urban Emergency Department [Internet]. Vol. 19, *Western Journal of Emergency Medicine*. 2018. p. 926–33. Available from:
<http://dx.doi.org/10.5811/westjem.2018.9.39369>
 22. Moe J, Bailey AL, Oland R, Levesque L, Murray H. Defining, quantifying, and characterizing adult frequent users of a suburban Canadian emergency department. *CJEM : Journal of the Canadian Association of Emergency Physicians*; Pickering. 2013 Jul;15(4):214–26.
 23. Doupe MB, Palatnick W, Day S, Chateau D, Soodeen R-A, Burchill C, et al. Frequent users of emergency departments: developing standard definitions and defining prominent risk factors. *Ann Emerg Med*. 2012 Jul;60(1):24–32.
 24. Government of Canada, Canadian Institutes of Health Research, Institutes, Institute of Population, Public Health. Dynamic cohort of complex, high system users – 2011-2015 [Internet]. 2017 [cited 2022 Apr 20]. Available from: <https://cihr-irsc.gc.ca/e/50129.html>

Appendix A. Summary of select features of papers reporting on frequent emergency room use in Canada.

Paper	Study Type	Location (Population)	Data Source	Years Studied	Definition	Frequent Use	Rational for Definition Used
Characteristics of frequent users of the emergency department with chronic pain	Cross-Sectional Study	Urban tertiary care academic medical center in Canada (chronic pain)	Medical records	2012-2013	12+ visits/year (top 1% of the population)	1% of the population	Resource limitations
Frequent emergency department use by older adults with ambulatory care sensitive conditions: A population-based cohort study	Retrospective Cohort Study	Quebec (community dwelling individuals aged 65+ who consulted ED at least once)	Régie de l'assurance maladie du Québec	2012-2013	4+ visits/year (top 6.6% of the population)	6.6% of the population	The most accepted definition
Profiles of Frequent Geriatric Users of Emergency Departments: A Latent Class Analysis	Retrospective Cohort Study	Quebec (individual aged 65+ living in the community who consulted an ED 4+ times in the previous year and who had received a diagnosis of ambulatory care-sensitive conditions in the 2 years preceding the index date)	Régie de l'assurance maladie du Québec (RAMQ)	2012-2013	4+ visits/year	Generally used definition	
Factors associated with chronic frequent emergency department utilization in a population with diabetes living in metropolitan areas: a population-based retrospective cohort study	Retrospective cohort study	Quebec (patients living with diabetes)	Régie de l'assurance maladie du Québec: RAMQ	2007-2009	3 visits/year for consecutive years (top 2.6% of the population)	Distribution of visits	
Characterizing Highly Frequent Users of a Large Canadian Urban Emergency Department	Retrospective Chart Review	Ottawa	The Ottawa Hospital Data Warehouse	2014	99th percentile (7+ visits/year)	No explanation provided	
High utilizers of emergency health services in a population-based cohort of homeless adults	Population-based prospective cohort	Toronto (homeless adults)	Survey, 2006 Census of Canada, National Ambulatory Care Reporting System (NACRS)	2004-2005	Top 10% of the population (4.7 visits/year)	No explanation provided	
Frequent users of emergency departments. Do they also use family physicians' services?	Population-based, observational, cross-sectional study	Ontario	OHIP data, Census Canada, Postal Code Conversion File	1997-1998	12+ visits (top 0.3% of the population)	"Ultimately arbitrary" relatively conservative cut-off, month visits easily recognized by ER physician	
Repeat emergency department visits by nursing home residents: a cohort study using health administrative data	Cohort Study	Ontario (age 65+, visited ED at least once)	provincial administrative data (CCRS, NACRS, DAD, RPDB)	2010	4+ visits/year (top 11% of the population)	Consistency with prior literature	
Characteristics of frequent users of emergency departments in Alberta and Ontario, Canada: an administrative data study	Cohort Study	Alberta and Ontario	NACRS	2015-2016	Top 10% of the population	No explanation provided	
Characteristics of Pediatric Frequent Users of Emergency Departments in Alberta and Ontario	Cohort Study	Alberta and Ontario	NACRS	2015/2016	Top 10% of the population	No explanation provided	
Frequent users of emergency departments and patient flow in Alberta and Ontario, Canada: an administrative data study	Cohort Study	Alberta and Ontario	NACRS	2011-2016	Top 10% of the population	Consistency with CIHI definition	
Defining, quantifying, and characterizing adult frequent users of a suburban Canadian emergency department	Retrospective Chart Review	Alberta (Westview ED)	NACRS	2010-2011	95th percentile (5+/year)	Frequency distribution used for comparability across institutions, 95% conceptually similar to two standard deviations, 99% captures extremes	
Disordered lives: Life circumstances and clinical characteristics of very frequent users of emergency departments for primary mental health complaints	Retrospective thematic analysis	Saskatoon Health Region	electronic administrative data	2012	10+ visits>MH (34 pts)	No explanation provided	
Developing Standard Definitions and Defining Prominent Risk Factors	Retrospective Chart Review	Winnipeg Health Region	Health care use records	2004/2005	Less frequent: 1-6 visits, frequent: 7-17 visits (3.6% visits), highly frequent 18+ visits	"Select patient characteristics were viewed by ED visit frequency, and "breakpoints" in these trends were sought"	
Frequent users of an inner-city emergency department	Retrospective Chart Review	HSC Winnipeg	Chart review	2005	15 + visits/year (Top 0.36% of the population)	Literature suggests characteristic differences between users with less than and more than 20 visits per year, but to ensure complete capture of the population, used 15	
Characteristics of frequent emergency department users in British Columbia, Canada: a retrospective analysis	Retrospective Analysis	British Columbia	NACRS	2012-2016	3+ visits/year (top 13.8-15.3% of the population) increase over time	Consistency with CIHI definition	