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Title	**Characteristics in healthcare related to mental health and substance use amongst clients of Community Health Centres in Ontario, Canada: a population-based cohort study**
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Reviewer 1	Danielle Rice
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General comments (author response in bold)	Throughout the Paper 1. Revisions to the language should be considered when referring to mental health and substance use. These are conditions/disorders that are being referred to from my understanding, but this is not clear. It makes aspects of the paper unclear. As an example, the following sentence reads that CHC clients have “higher rates of mental health” which is not clear. Mental health is not considered in rates, although mental health conditions are. The sentence is […] “would appear that both UR and NUR CHC clients have higher rates of mental health and/or substance use than community control” **--Thank-you for the comment. We have swept through the paper and edited a few indications of ‘mental health’ to ‘mental health conditions’ when described by rates. p10** 2. Using less colloquial language throughout the paper would improve the readability. **--We have swept through the paper and removed/edited anything we consider colloquial.** Abstract 1. The interpretation of the abstract could be improved by being more specific. Noting that “special attention” should be paid does not provide a clear sense of actionable next steps based on the study findings. More directive future next steps could be presented instead. For example, perhaps a next step is to ensure that medically complex individuals have access to the services they deem necessary. **--Thank-you for the comment. At this point in the research, we still believe that special attention should be afforded to the CHC cohorts described in this study. As some of the most vulnerable populations in Ontario which has been historically excluded from various types of healthcare administrative database research, we believe the denotation of ‘special attention’ is still warranted. We have edited a bit of the ‘Interpretation’ section of the abstract to stress a bit more targeted actions that we are comfortable tabling in light of the study findings.** Introduction The introduction is an appropriate length and provides important background information. I have two considerations for the introduction: 1. It would be helpful to consider the following article about capacity building for mental health/substance use (I , Khenti et al., 2017, Cam Fam Physician). **--Thank-you for the suggestion. We have added the Khenti et al. reference to the mid-section of the Introduction p4** 2. On page 4 line 40 where rationale for the study is presented, additional information should be added. A sentence or two noting why the increasing rates of mental health and

addictions in Ontario relate to the need to present information about CHC clients would strengthen the introduction.
--Thank-you for the comment – we have added another sentence to this paragraph located on page 4 to help with the justification. p4

Methods
It is not stated why the specific exclusion criteria for age was applied. Why was the cohort restricted to individuals that were at least 21 years old? The rationale for this decision should be added to the methods section.
--We have provided rationale to the <21 exclusion – namely, in order to ensure we obtained a comprehensive 3 year look back window for selected comorbidities that were used as covariates in our analysis. p6

Details related to the inclusion criteria should be provided in relation to the "history of mental health and substance use related disorder in the preceding two years". Were these most responsible diagnoses? Or reason for presenting at the CHC (for example)? Or were new patients who had a previous episode of major depression (for example) still included? This should be clarified to improve the transparency of reporting and ensure that methods could be replicated by others to allow for future trending data.
--Due to word space limitations in this work, we are unable to fully describe all the diagnostic codes and definitions used to help generate the cohorts. We have inserted another reference to the 'Supplement Appendix A' in this section of the Methods which contains all the codes used in this study so that others can replicate the methods. p6

It would be helpful to have the list of urban at risk and non-urban at-risk sites provided as appendix.
--Thank-you for the comment. In an effort to avoid any potential privacy breach and/or targeted stigmatization toward the CHC populations in this study, we have purposefully elected to not provide the list of sites as an appendix. This decision was made consciously by the research team prior to submission of the first version of this study.

Suffice to say, all the urban at risk CHCs (*PPCHC) are within large urban centres in the province. We have stressed this aspect in the description of the urban at risk CHC (*PPCHC), without specifying identifying the CHC's name. We have also identified in the body of the manuscript that there are 18 urban at risk CHCs (*PPCHCs) in the province.

The supplemental appendix is helpful, adding an additional column that notes if variables were outcomes, predictors, etc would also be helpful for readers.
--In an effort to keep the appendix clear, we have added asterisks to the study outcome variables, and added a footnote denoting as such. see Supplemental appendix A

Were the CHC comparator groups matched on any other criteria aside from a past history of mental health and/or substance use related issues? This should be noted more clearly in the methods section (e.g., age, sex?).
--You are correct. The comparator was arguably a crude comparator, but given the study purpose and resources allocated to this study, we felt the current approach to be a pragmatic approach as a first inquiry to the CHC population.

Given the intent of our comparator in this study (to provide a reference to the two CHC

	cohorts) we believe the current comparator is sufficient for the purposes of the study – but will take this consideration forward when we evolve elements of this study in the future using more specific methods. The authors could have considered applying propensity score matching approaches to this work. Is there a reason this wasn't done? **--Due to study resources, we were unable to attempt propensity score matching approaches (i.e., cost prohibitive due to the increased amount of analyst time required to complete the analysis within the secured research environment operated by ICES). That said, a propensity score approach would have been ideal in order to generate a comparator for a study like this. For future studies, we plan to undertake this approach, although it is largely based on available resources.** Are there exclusion criteria that were applied for any cohorts? There are none listed in the methods, however, the figure/flow diagram of patients includes exclusions. These should be clearly listed in the methods section to enhance replicability and transparent reporting. **--We have heavily edited the Study Population section of this paper and believe that we have normalized our methods more so with the revised study Figure. We hope this is sufficient to address this query. see p6 and Figure 1** The reasons for selecting the outcomes of interest are unclear. Why was cardiologist, endocrinologist etc selected for visits? This should be noted in the methods section to understand this choice of outcomes. **--Given the lack of understanding regarding CHC cohorts, we selected a subset of specialists to gain some insights to their utilization. We have attempted to provide some rationale for these specialist selections within the Outcome Measure section, in that in order to obtain "an initial understanding of the CHC cohorts and their related health system use, including basic markers of quality of care and client complexity" were selected.** **p7** In the variables section of the methods the "type of mental health or substance use" related health condition is discussed as a predictor variable. How were type of mental health or substance use diagnoses defined and categorized? This should be presented in the methods. **--Thank-you for the comment. We received a similar comment from another reviewer requesting the same addition. In the Study Population section we have attempted to very briefly describe this. Given the word limitations of CMAJ Open, we are unable to further describe the diagnoses in detail. Our Supplemental Appendix A provides the codes and categorization of our variables. p6, 7** The data analysis section should include all relevant information to repeat the analysis conducted. In its current format, on page 15 adjusted odds ratios are mentioned but the list of variables being adjusted for are not provided. **--Thank-you for the comment. We attempted to add this level of detail into the main manuscript, but due to word limitations we were unable to. In the footnotes of all tables where adjustments were made, a listing of the covariates can be found. We hope this is sufficient as our 2500 word limit, especially including the requested revisions, has forced us to move various elements of the manuscript to footnotes or Supplemental Appendix B.** Interpretation

	Some of the language in the interpretation section could be improved to be more objective. The value of “painting a deeper picture” is difficult to understand and does not lend itself well to those who do not speak English as their first language. **--Thank-you for the comment. We have modified this idiom. p10** Revisions should be considered for the interpretation section to ensure that various perspectives and possibilities are being considered for the results. While the authors note that CHC clients are more intense users of clinical specialists, perhaps a consideration is that these individuals are now better connected and have better access to specialists based on their visits to the CHC. On the other hand, additional visits to the ED may suggest that these patients are not receiving the services necessary at the primary care level and are requiring more acute services despite this not being the optimal setting for mental health care management. Considering the findings from various perspectives could help with future work in this area. **--We agree – our hesitation to offer more targeted implications arises from desire to avoid over-stepping our findings. Given this is a first study of the CHC mental health/substance use population, we did not have the evidence to suggest that these individuals are better connected to the healthcare system (although, we believe they probably are). Future planned studies we have earmarked will be targeting many of the ideas presented in your comment, so they will live-on in future works.** **For the purposes of this study, we have offered a possible considerations in the implications section (i.e., to explore larger patterns of use across the health system), but given the limitations of this study, we would rather be more cautious in offering implications based on the findings to avoid any over-stepping of our data. p11** The first sentence of the conclusion could synthesize the findings in a way that does not re-repeat information from the interpretation section. The authors should consider the main takeaway and how the characteristics may link together. **--Thank-you – we have revised the first sentence of the conclusion to attempt a higher level combination of the findings and interpretation, and how these characteristics may link together. p13** **In the conclusion, the last sentence notes that the findings have important policy and practical implications but the implications are not stated. These details should be added either to the conclusion alone or in the conclusions and the interpretation.** **--Thank-you for the comment. While we agree and would like to offer further details, the word limit of this manuscript (2500 words) has prevented us from being more verbose in either the implications or conclusion section, especially as related to policy implications.** Title 1. It would be beneficial to consider revising the manuscript title. I think rather than “trends” the paper is presenting “characteristics” of clients. Further, I wonder if also adding a word after “healthcare” would be clearer. Perhaps it could read something like: “Characteristics of clients with mental health and/or substance use related healthcare disorders who use Community Health Centres (CHC) in Ontario, Canada: A population-based cohort study”. **--Thank you for the suggestions. In combination with this comment and**

	suggestions made by the Editor, we have changed the title of this paper to: **Characteristics in healthcare related to mental health and substance use amongst clients of Community Health Centres in Ontario, Canada: A population-based cohort study** **We hope this addresses both critiques. We think this title better captures the essence of the work. p1** 1. It would be helpful to define the acronyms AOR and CI on their first use. **--Thank-you for the comment. We have revised AOR usage throughout the paper. p10** Introduction 1. The following sentence requires a citation "Mental illness and substance use disorders are prevalent within the Ontario population, especially in vulnerable and marginalized populations." **--Thank-you for the comment. We have added supporting citations to this statement. p4** Methods 1. Page 14 line 40, "impatient diagnostic codes" should be changed to "inpatient". **-Thank-you for catching this typo! We have changed this on page 14 and swept the paper for any other typos related to 'impatient'. p14**
Reviewer 2	L. Reifels
Institution	Centre for Mental Health | University of Melbourne
General comments (author response in bold)	ABSTRACT 1. Could more clearly refer to cohort (3) as "community controls" **--Thank-you for the comment. We have added this to the methods section of the abstract p2** INTRODUCTION (1st sentence): would benefit from a supportive reference outlining the prevalence of mental illness and substance abuse issues in Ontario **--We have added two references to the first sentence to support the prevalence of mental illness/substance in Ontario p4** (p.4 Line 31): check grammar of sentence starting "While there has been…" **--Thank-you for the comment. We have revised the sentence. p4** The role of CHCs in relation to the care for mental health and substance use issues remains somewhat unclear (e.g., triage, diagnosis, treatment, support services). Could clients presenting to the CHC with such issues for the first time (and no prior history) be diagnosed at the CHC as such, and would they be inclined to approach the CHC for these issues specifically in the first place (rather than for other co-occurring health issues)? **--Thank-you for the comment. The CHC model of care in Ontario is a wrap-around primary-healthcare service that encompasses many types of medical care, healthcare, and psycho-social supports. We have attempted to describe the CHC in extreme brevity due to the word limitation of CMAJ Open (2500 words). We have**

	provided references to that better describe the CHC model of care and hope that these can be used to better describe the variety of services afforded by the numerous CHCs in the province. **Further, while we have some anecdotal understanding that CHC clients generally prefer to use CHC services for various elements of their healthcare, there is no formal research completed to date to help fully support these assertions – this study, being the first to our knowledge that focuses on exploring the healthcare utilization of distinct CHCs cohorts. In future work, we plan to use the findings arising from this study to help better target cohorts within the CHC for deeper exploration, including time-order studies that trace individual users through their CHC navigation and other social network approaches that can show how CHCs 'fit' within the larger healthcare ecosystem within the province.** METHODS (Data sources): if "ICES" is an acronym, it could be spelled out in full at first use **--In 2018, the institute formerly known as the Institute for Clinical Evaluative Sciences formally adopted the initialism ICES as its official name. This change acknowledges the growth and evolution of the organization's research since its inception in 1992, while retaining the familiarity of the former acronym within the scientific community and beyond. As such, ICES is no longer considered an acronym. p5** (Study population): if "non-urban at risk (NUR)" includes both CHCs in urban and rural areas, then I'm not certain that "non-urban" is quite the right term to fully capture the defining characteristic of this population **--Thank-you for this comment. In an effort to reduce confusion, we have changed 'urban at risk' (UR) to 'Priority population CHC' (PPCHC); and, 'non urban at risk' (NUR) to Non-priority Population CHC (NPPCHC).** **We hope this is a clearer method to describe the two different cohorts. We have normalized this change throughout the manuscript, including all text, tables, and figures – and where applicable, in the Editor/Reviewers' comments also.** (Study population): to better illustrate the typical "NUR CHC" target population, examples of such non-priority groups who experience barriers in access to care could be listed here **--We have added a few short examples of non-priority groups who experience barriers. Due to word limitation on this paper, we have not been able to be more verbose and hope that the reference to the technical report describing CHCs will be helpful. p7** Further detail could be provided on how you derived the sample of community controls. **--We have added a section to the end of the Study Population section briefly describing PCPOP – a derived ICES dataset that contains Ontarians and their healthcare use/demographic information p7** It appears that the defining inclusion criteria for both CHC cohorts were: a) first-time CHC use and b) prior healthcare history, whereas for the community controls it was merely the latter b). If that is correct, it raises questions about the direct comparability of CHC and control subjects, as it would suggest that the CHC cohorts are more likely (by definition) to be using services. This should be critically reflected upon in the interpretation of results in the discussion.

	--Thank-you for the comment. The CHC cohorts were 'first time' CHC users during the accrual time period. These clients may have been previous users of CHC (prior to 1 April 2014). Essentially, we wished to obtain new interactions with the CHC of people who had previous system interaction for mental health/substance (whether this previous interact was with the CHC or another PHC structure). **The community control cohort excluded individuals who accessed the CHC, as we wished to see if the CHC cohorts were different from a community comparator.** **While we appreciate that the comparator isn't exacting, we felt it was sufficient given this was the first study we know of that attempted to quantify various dimensions of CHC populations. In future studies, we hope to attempt more detailed analyses of the CHC cohorts and generate more robust comparators.** **In an effort to compromise, we have added notations of this aspect of comparability into the limitations section. p12** RESULTS (First paragraph): the structure of the first paragraph is slight confusing and internally contradictory. The first sentence describes the three cohorts of CHC UR, NUR and community controls as having "a history of mental health and/or substance use related healthcare", whereas the second sentence qualifies that only a small proportion of each had in fact fulfilled that defining criterion. This seems to contradict the definition of these three groups in the Method (Study Population) section which was predicated on prior mental health or substance abuse related service use over the past two years (see also Figure 1). This paragraph should be clarified, and the defining criteria for inclusion within each group clearly outlined in the Method section. **--We have edited the first paragraph of the Results related to another comment; also, we have edited sections of the Methods where the three cohorts are described. We hope that these edits have clarified the confusion described in your comment. p6 & 9** **(p.9, Line 17): "NUR CHC clients were generally female, rural, more middle-incomed…"; suggest rephrasing to: "NUR CHC clients were more likely to be…"** **--Thank-you for the suggestion. We have changed this section. p9** DISCUSSION 12. Could you: a) clarify the rationale for why the study solely focused on first-time CHC users <u>with</u> a prior history of mental health and/or substance use related healthcare, and b) comment on the implications of excluding first-time CHC users <u>without</u> prior mental health and substance use care history (e.g., in terms of the representativeness of your resulting CHC client profiles and related study findings). **--Thank-you for the comment. While we could have completed a study where mental health and substance use was an outcome, we elected to generate our cohorts (and study purpose) specifically examining people who have mental health and/or substance use healthcare. The objective of our study outlines our desire to "identify CHC clients with a history of mental health and/or substance use related healthcare, and describe their demographics…"** **That said, for future works examining CHC populations, we may attempt broader examinations of the CHC client population. For the purposes of this study, we sought to examine populations with mental health/substance use.**

	13. One of the key roles of primary health care typically involves linking people in with relevant specialist services. Greater mental healthcare and substance service use of the two CHC cohorts observed during the follow up period may therefore not only be a reflection of greater case complexity, but also potentially a function of relatively greater or increased service access (i.e., as a consequence of being involved with the CHC). Could you reflect on the extent to which this may have played a role in this context. **--Thank-you for this comment. We had originally attempted to provide a bit of discussion around this 'linking' aspect that CHCs can provide in terms of connecting individuals with services. Due to word limitations and discussion/reflections that began to border on anecdotes, we elected to avoid overt discussion of your described comment.** **From the insights gained in this study, we plan to follow CHC patients through their health system utilization using more specific methods, so we are able to better describe the linking of services that occur in/around/through the CHC. Unfortunately, the methodology of this study does not provide use enough insights to enter into this level of discussion without going beyond the analyzed data.** (p.19, Line 12, Limitations): check grammar of sentence starting "While were we able to account for…" **--Thank-you – we have revised this sentence. p12** Despite the table footnote, would suggest rephrasing the following section headings: "… within 3 years" "… within 2 years" and "… within 1 year" to more clearly indicate that these events happened in the past (prior to entering the cohort or the index date) and to better distinguish these from identical wording used for the follow-up period (see Table 2). **--Thank-you for the comment – we have updated Table 1 significantly and hope that our changes (i.e., added "within X years prior to the index date; added new footnotes) addresses this comment. see Table 1**