Article details:	**2017-0152**
Title	Trends in treatment of problematic cannabis use in Ontario's specialized addiction treatment system from 2010/11 to 2015/16: a repeated cross-sectional study of a health administrative database
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Reviewer 1	Dr. Fiona Clement
Institution	Department of Medicine, University of Calgary, Calgary, Alta.
General comments (author response in bold)	This is a very important topic with many physicians and the general public hungry for good research on cannabis. However, this paper needs improvement. I outline a few areas of focus below. **Thank you for acknowledging the importance of the research, as well as providing comments for improvement. The concerns outlined have been addressed below.** The background mixes up medical cannabis use and recreational. I think the rationale for the study would be strengthened if the authors focused on their argument for recreational cannabis as opposed to bringing in medical cannabis. **Discussion pertaining to medicinal cannabis legislation has been removed from the introduction, whereas further details have been provided concerning recreational cannabis legislation, including the Cannabis Act tabled last year by the federal government (Page 4).** In addition, the authors need to very carefully scrutinize their language throughout the paragraph on page 6 - cannabis use, cannabis use disorders and addictions are three distinct concepts and the authors should take care to be exact in their language about which one they mean. **The language in the paragraph on page 6 has been revised. The literature cited from Ontario was based on previous analyses from the Drug and Alcohol Treatment Information System. As such, "treatment utilization for cannabis use disorders" has been changed to "clients in treatment for problematic cannabis use" (Pages 4 - 5). Also, the term addiction severity has been replaced throughout the manuscript with cannabis use frequency.** In table 1, it appears that the characteristics of people accessing cannabis substance disorder support has changed over time. This is an important finding worthy of further discussion. **It has been added in the interpretation that since the characteristics of clients in treatment for problematic cannabis use have changed, continued monitoring of these changes is required for the adequate tailoring of treatment programming for clients (Page 12).** In table 2, it would appear that ~13% of respondents each year claimed they did not use cannabis. Given that the entire cohort is selected based on cannabis substance disorders, this points to a very significant bias in the use of self-report or the health data records. This at least must be discussed in the limitations section. **It has been added that the time frame for cannabis use frequency pertained to the past 30 days (Page 7).** **It was possible for clients to report no cannabis use because they may have continued with treatment even though they were not using cannabis to maintain prior treatment gains. However, the potential of social desirability or misclassification biases could not be ruled out. As such, this specific scenario has been elaborated upon in the limitations (Page 13).**
Reviewer 2	Dick Bijl
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General comments (author response in bold)	The present study relates to an interesting and possibly important public health issue, the use of cannabis in Ontario, Canada. The authors conclude that there may be reductions in unnecessary treatment of cannabis use disorders. This conclusion might have some impact on public health if it could be substantiated enough. This is an observational study, in fact a data-base study and I have some problems with these kind of studies because the conclusion might be flawed. Apart from that I have some other comments which I will describe in detail below. The page numbers I refer to are the ones at the bottom line, therefore the first page is page 0. **Thank you for acknowledging the importance of the research, as well as providing comments for improvement. The concerns outlined have been addressed below.** Page 0-1 The keywords on page 0 are not the same as page 3. **The keywords have been revised (Page 3).** Page 4. Line 53. The authors use an indirect indicator of cannabis use disorders which might also flaw the conclusions but is not addressed in 4.3 Study strengths and limitations. **The purpose of the present study was not to estimate the prevalence of cannabis use disorder through prevalence of treatment for problematic cannabis use. As such, there was no related discussion concerning this matter in the limitations. This sentence has been removed.** Page 5. Line 12. It is desirable to refer also to the data from the EU and especially the Netherlands because there is much experience with the cannabis problem. **Response: Trends in the prevalence of daily cannabis use among first-time treatment entrants for cannabis problems in the European Union have been described (Page 5). However, the analogous data for the Netherlands was not available.** Line 22. The authors do not clarify why they started in 2010/11. **Reporting of data by treatment agencies to the Drug and Alcohol Treatment Information System became a mandatory provincial funding requirement in 2008/09, with further standardization of procedures thereafter. As such, the start date was chosen to be 2010/11. This has been described in the methods (Page 5).** Line 48. DATIS is not the only data-system for drug use in Canada. The authors should point out the differences with the other system(s) and explain how representative this system is. **It has been described that the Drug and Alcohol Treatment Information System is the reporting system for**

	provincially funded addiction treatment services in Ontario. It includes all clients that receive non-medical, community funded services (i.e. excluding physician and hospital funded services). Reporting of service utilization data by the agencies to this system is a mandatory funding requirement set by Ontario's Ministry of Health and Long-Term Care (Page 5). **Each province and territory in Canada has its own system for the reimbursement of publicly funded addiction treatment services. Performing comparisons with all other systems is beyond the scope of the present study. Therefore, the National Treatment Indicators Reports have been referenced for further information, which briefly describe such systems across other provinces and territories (Page 6).** Line 53. DATIS is part of a health administrative database. The diagnoses in this database have not been validated by blood and urine measurements. This is not clearly stated in the article yet this means a risk of flawed data. I would also like to know whether there have been validation studies related to whether DATIS is really based in the general population. **It has been stated in the methods that there was no confirmation of problematic cannabis use and problematic cannabis and other substance use classifications by blood or urine measurements (Page 6).** **No validation studies have been conducted to examine the population covered the Drug and Alcohol Treatment Information System. As described in the methods, all clients that receive non-medical, community funded addiction treatment services through the province of Ontario (i.e. excluding physician and hospital funded services) are included in this database (Page 5).** Page 6. Line 8. A number of services are not included. We need to know how much of the population is excluded then. **Comprehensive data describing the extent of addiction treatment services received by types of services are not available. The National Treatment Indicators 2013-2014 Report has also discussed the overall dearth of data on this topic as an area for improvement. They noted that it is not possible to determine the total number of clients accessing addiction treatment services in Canada, partly because the numbers of private and public services providers are unclear, as well as the client capacity and wait times for treatment programs are not known.** Line 20. The clients provide data. This could lead to bias. So, are there any studies regarding the reliability of these data? If this has not been checked this could lead to misclassification of the CO and CP-groups. **No validation studies have been conducted to examine the reliability or validity of the data from the Drug and Alcohol Treatment Information System. A section on data quality has been added to the appendix, which describes safeguards in place to address these concerns. These include validation measures (business and logic rules) and usage of pick lists during the data entry, as well as an annual data quality review (Page 23). Furthermore, potential of social desirability, recall and misclassification biases have been noted as limitations in the interpretation (Page 13).** Line 45. A correlation is actually a meaningless statistical association and should not be used. **The word correlation has been removed. Importantly, correlations were not conducted in the present study.** Page 7. Line 3. It is not completely clear what admissions refer to? Admission in a hospital or elsewhere or does it refer to admission in the data-base? **It has been described in the methods that admissions referred to admissions in the database, irrespective of the treatment agency (Page 6).** Line 48. The authors performed multiple comparisons but they did not use corrective analysis like Bonferroni. Why not? **This was a population-based study involving all clients with problematic cannabis use that received non-medical, community funded addiction treatment services through the province of Ontario (i.e. excluding hospital and physician funded services). Since the present study was not based on a recruited sample, adjustments for multiple comparisons were not needed.** Page 8. Line 43. There is no information on the results of the statistical significance of the data in these lines. **The p-value from the linear trend test has been added for the number of admissions starting between 2010/11 and 2015/16 (Page 8).** Page 10. Line 22. There is no information on the results of the statistical significance of the data in these lines. **The p-values obtained from the chi-square tests are included in Table 2 (Pages 18 – 19). They were not included in the text to prevent redundant presentation.** Page 11. The interpretation is sometimes difficult to understand. **The manuscript overall has been revised for clarity.** Line 36. There are only absolute numbers, but percentages should be added. Are these data from the same data-base? **The study by Urbanoski et al. is based on the same database, albeit with a different methodology. The corresponding percentages for the absolute numbers have been added (Page 11).** Line 50. For foreigners it is difficult to understand what NTIR stands for and what is the relationship to DATIS. **It has been detailed that the National Treatment Indicators Reports compile data from various publicly funded addiction treatment systems in Canada, including Ontario's through the Drug and Alcohol Treatment Information System (Page 11).** Line 55. Have these differences been tested statistically? **These estimates were extracted from two separate, published reports. As such, they were not tested statistically.** Page 12. Line 8. It is not possible to verify this statement because no data on statistical significance are shown. **The statement concerning the consistency of findings from the present study and previous findings from the National Treatment Indicators Reports has been removed.**

	Line 41. This is not clear because the study design is not explained. **The study design has been described as repeated cross-sectional design (Page 5).** Page 13. General. There are quite a few limitations that can lead to flaws in the data and conclusions. Yet, there are more as I have explained above like case-ascertainment problems, diagnostic problems, and problems with the generalization. **Both case-ascertainment and diagnostic concerns stem from self-reported data, which has been noted as a limitation in the interpretation (Page 13).** **This was a population-based study involving all clients with problematic cannabis use that received non-medical, community funded addiction treatment services through the province of Ontario (i.e. excluding hospital and physician funded services). Hence, the findings are generalizable to this population.** Line 8. The authors have given no proof that their data-base can be regarded as population-based and therefore their statement that it can be generalized is not warranted. **This was a population-based study involving all clients with problematic cannabis use that received non-medical, community funded addiction treatment services through the province of Ontario (i.e. excluding hospital and physician funded services). Hence, the findings are generalizable to this population.** Line 27-31. This really is quite a big limitation of the study. **Utilization of withdrawal management services has been removed as a secondary outcome.** In conclusion, apart from the limitations the authors discuss there are more limitations that could seriously distort the conclusion. **The limitations described in the peer review have been addressed in the interpretation.**