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Title	Emergency department use by pregnant women: a retrospective population-based cohort study in Ontario
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Reviewer 1	Lucy Barker
Institution	Psychiatry, Women's College Hospital, Toronto, Ont.
General comments (author response in bold)	1.　　Overall, this is a very clear, methodologically sound paper that provides valuable information. 2.　　One area that could be expanded around the diagnoses at the index ED visit, since it will be important to know what the presenting concerns are in order to understand what care is actually needed by these women. **Although it is feasible to describe the discharge diagnoses of this cohort, it was beyond the scope/intent of this study. As mentioned in Response #8 above, most Ontario ED triage documentation and CEDIS complaints are documented on paper-based systems. Electronic triage documentation is slowly being introduced across Ontario, but was only started in 2017. Therefore, the requested details are largely missing for this Ontario-based cohort.** a.　　The paragraph on page 8, lines 36-46 was unclear to me: "The most frequent diagnoses at the ED visit were threatened abortion (7.7%), unspecified hemorrhage in early pregnancy (6.4%) and spontaneous abortion (4.5%). Additionally, the most prevalent diagnoses for ED visits within 42 days after a recognized pregnancy were spontaneous abortion (13.2%), missed abortion (4.9%) and threatened abortion (3.8%). Of all recognized pregnancies in the cohort, only 106,989 (3.9%) had an injury-related ED visit." -> Does "within 42 days after a recognized pregnancy" mean postpartum (or within 42 days of a first record of a pregnancy in the data, or something else)? If postpartum, then these diagnoses do not make sense to me. **We have revised as follows: "For the purposes of this study, the 42-day postpartum period was defined as the 42 days following the documented end of the pregnancy, whether that was a livebirth, stillbirth, miscarriage, induced abortion or a threatened abortion in the absence of a subsequent documented healthcare visit."** b.　　It would be helpful to see a longer list of the most common diagnoses, since only a minority of the presentations are captured in this short list. A table with common diagnoses by time period (first trimester, second trimester, third trimester, postpartum) would be particularly interesting if possible. **Please see response directly above. We hope to conduct such a future study once the requisite variables are available.** c.　　Clark et al (AJOG 2010) reported on ED use in the postpartum period (with diagnoses categorized as pregnancy-related and unrelated to pregnancy) and may be a helpful paper to include in the discussion of results. **We thank the reviewer for this suggested reference. We have included it as part of the interpretation of the results.** d.　　In the discussion, it may be worthwhile adding a discussion of which ED presentations are potentially preventable with better connection to outpatient care, and which are not. You write "only a very small proportion of ED visits appeared to be for conditions such as injury, for which an ED is most equipped to assess and treat." It

seems that there are many diagnoses that are not easily managed in outpatient clinic settings beyond injury and which the ED is best equipped to assess and treat (eg severe acute illnesses, major bleeds, etc).

We thank you for this suggestion for the discussion section. However, we feel this discussion is beyond the scope of the current study given we did not explore the indications or detailed diagnoses of the ED visits. We look forward to conducting future studies to explore preventable visits and their relationship to outpatient services.

3.   In the discussion, I would be interested to hear about any explanation for the findings in Figure 2.

We appreciate your interest in the results of this manuscript. We have provided further description of this relationship, within the word count limitations, to the interpretation section of the manuscript.

a.   Although you allude to the scarce resources in rural areas, some of the other findings would be interesting to explore. I wonder if the lower ED use for immigrant women is related to higher urbanicity in this population?

The relation between ED utilization and immigrant status is likely multi-factorial. Urbanicity undoubtedly plays a role, but also immigrants' perceptions of EDs may differ from Canadian-born populations.

b.   The relationship between antenatal care provider and ED use varies depending on the period looked at. I would be interested in hearing an explanation for these results. I imagine that some of this is because women whose pregnancies end in the first trimester would be more likely to visit EDs and would not yet be connected to an obstetrician.

As noted in our response to 10a, given a large proportion of women in the cohort had miscarriage or a threatened abortion without a subsequent outcome, many of these patients would not have seen an early obstetrical care provider before complications occurred. The same may be true for a patient who had an induced abortion, as women may have seen an abortion care provider without having seen an antenatal care provider.

Reviewer 2	Kathleen Decker
Institution	Research Institute in Oncology and Hematology, CancerCare Manitoba, Winnipeg, Man.
General comments (author response in bold)	Thank you for the opportunity to review this well-written, easy to read paper. 1. Why did you choose a modified Poisson regression over alternative count models such as a negative binomial or a gamma distribution? This could have an impact on the p values that were calculated. Response: Modified Poisson is actually not designed to model a counts-based outcome. Rather, M-P generates RRs, and, furthermore, tends to produce models without convergence issues that are sometimes seen with other methods used to generate RRs. The M-P approach allows permits the combined use of generalized estimating equations that account for clustering, specifically more than one pregnancy per woman during the study period. Please see https://academic.oup.com/aje/article/174/8/984/155441. 2. Why was age included as a categorical variable. By including age as a

continuous variable, you increase the power and accuracy of the analysis. Also, age appears to be non-linear in figure 2 so should be continuous.

A priori, maternal age was categorized in a manner that would be consistent throughout the paper. That is, age was presented in Table 2 and Figure 2 as 25-34, ≥ 35 and < 25 years. We wanted to align with these categories in the multivariable Poisson models. There was no concern about statistical power within the multivariable models, and the age groups that we used, while more restrictive than is sometimes seen, is like that used by others (e.g., https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002307).

3. Why did you only adjust for ADGs? If this was the research question (i.e., what is the impact of co-morbidity on ED use), this would make sense, but why not adjust for all variables in the model? The very narrow 95% CI in the results section suggest that there may be a lot of over-dispersion that is not being accounted for (see the top of page 8).

First, overdisperson is not a concern in our modeling approach, which is not a counts-based model (see #1 above). Second, the current study "was undertaken to quantify and characterize ED utilization among all Ontario women who had a recognized pregnancy, including by trimester and within 42 days after pregnancy, and further stratified by pregnancy outcome, namely, livebirth, stillbirth, miscarriage and induced abortion; as well as women who had a threatened abortion in early pregnancy without a subsequent recognized pregnancy outcome." The study offered a novel view of ED use during and after pregnancy, including by the type of recognized pregnancy. Complex modeling was not something we considered, as neither causal nor mediated pathways were of interest, and handling of potential confounding would not have altered the material findings of the main analyses related to the main objectives. Instead, we largely present the main findings further stratified by variables like age, parity, income quintile, etc. We admit that the study was not ADG-focused, and that we adjusted for ADG because we thought that this variable would have the largest influence on a woman's intrinsic tendency to need ED care. If the editors press us, then we can run some models with all covariates included, but our study message is unlikely to change, namely, that "Nearly 40% of women in Ontario had an ED visit around the time of pregnancy. ED utilization was significantly more likely to occur in first trimester and in the first week postpartum. Overall, the most common ED diagnoses were for conditions arising in the first trimester: threatened abortion, unspecified hemorrhage in early pregnancy, and spontaneous abortion."

4. Why did you not look at time interactions?
We could have done so, but this study was not really focused on time trends in ED use. Whether we found an upward or downward trend in ED use over time, we do not think that the main findings would carry a different degree of weight for health policy planners around obstetric care or ED systems. The clear message herein is that ED use is very common at different phases of pregnancy, and by pregnancies with different outcomes.