Author's response to reviews

Title: Emergency department utilization among recently released prisoners: a retrospective cohort study

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Author's response to reviews: see over
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Dear Ms. Costoy

Thank you for your ongoing review of our manuscript entitled “Emergency department utilization among recently released prisoners: a retrospective cohort study”. We again appreciate the thoughtful suggestions of the reviewers and have made every effort to incorporate their suggestions in the revised manuscript.

To summarize revisions, we have attempted to clarify the definition of our study cohort as well as the limitations of our novel though imperfect dataset. We also revised our Figure to present greater detail on visit timing. We believe that our findings are an important addition to the literature addressing the health and healthcare of a large, vulnerable population. We acknowledge that our study does leave open interesting next questions and plan to address these in our future work.

As noted in Response 8, we were not able to involve the study’s primary programmer in this round of revisions in time for the current deadline. If the Editors would prefer that we pursue alternative modeling strategies prior to accepting our manuscript, we will gladly and promptly do so if provided a short extension. As the Corresponding Author, I look forward to working with you moving forward. If more expeditious, I can be reached by phone at (317) 509-0071 or by email at josephwfrank@gmail.com

Below you will find a response to each of the reviewers’ suggestions as well as the corresponding references to the revised manuscript.

Referee 1 (Sheila Bird):

Comment 1:
1. Description of ex-prisoner cohort is careless, and this carelessness is carried into Abstract.

1.1 1434/6046 ex-prisoners (24%) had at least one ED visit in the 1st year after index release; and these 1434 accounted for 5145 1st-year ED visits, an average of 3.6 visits per person who visited ED; or of 0.85 1st-year ED visits per ex-prisoner.

Response 1:
It appears that this comment stems from a lack of clarity on our part regarding 1) the cohort being studied as well as 2) the limitations of the dataset being analyzed. We apologize for the confusion.

1) We have limited our analyses to those ex-prisoners with at least one encounter in the hospital system of interest during the year following release (N=1434). The state of Rhode Island offers a unique opportunity to study an ex-prisoner population as it is the smallest state in the United States (~1500 square miles) and therefore most ex-prisoners are released to a limited geographic area. We studied utilization within the state’s largest hospital system but several other healthcare systems are present in Rhode Island and nearby states. Our data do not capture utilization at these other
facilities. We therefore focus our attention on the 1434 ex-prisoners whose healthcare utilization occurred within the healthcare system of interest and have added a note in the Methods to clarify this point.

2) We have avoided presenting rates of utilization for a similar reason. As we lack utilization data for many of the individuals released during the study period, we felt that rates would be misleading and potentially biased if utilization at other facilities differs from the utilization seen in the healthcare system of interest.

We certainly agree with the reviewer that a comparison of utilization rates will be an important addition to the literature. We continue to work with the state’s Department of Health to pursue access to more comprehensive data that would facilitate such a comparison.

Location: Page 8; Page 15

Comment 2:
1.2 Ex-prisoners 1st year ED-visit rate of 0.85 per ex-prisoner compares with 328,224 visits in 3-years by general population aged 18-70 years of 1,048,309 persons, an average of 0.10 ED-visits per person per annum. By ED-visit type, ex-prisoners’ annual rate per 100-persons: for b) mental health was 5.4 per 100 ex-prisoners vs 0.4 per 100 persons aged 18-70 yrs in general population; for c) substance use was 13.4 per 100 ex-prisoners vs 0.4 per 100 persons aged 18-70 yrs in general population; and for d) ACSC was 11.6 vs 1.4 per 100 persons aged 18-70 yrs in general population.

Response 2:
We find these comparisons compelling but, as noted in Response 1, we have opted not to present such comparisons as they may be biased in unpredictable ways given the limitations of our data.

Location: N/A

Comment 3:
1.3 Of the 6045 ex-prisoners, 455 (7.5%) had 3 or more ED visits and 102 (1.7%) had 10 or more. [EDIT ABSTRACT!]

1.4 Of 6045 ex-prisoners, only 338 (5.6%) were re-incarcerated in the 1st year after index-release

Response 3:
As noted in Response 1, we have restricted our analyses to the 1434 ex-prisoners with at least one encounter in the hospital system of interest during the year following release. In an effort to avoid confusion, we now present the raw numbers rather than proportions in the Abstract. We also more explicitly define the denominator when presenting proportions in the Results.
Comment 4:
2. REVISE Table 1 & Figure 1 - the rest of this paper is about 3 types of ED visit or 1st-ED visit.

2.1 Present Figure 1 as 4 mini-figures, the first a) (as now) for 1st ED-visit of any type - add to mini-figure the number of such visits in 1st fortnight; 2nd fortnight, next 8 weeks [219; 135; 316, I think] & note that if week 3-12 rate had applied in 1st fortnight, you'd have expected 90.2 1st ED-visits in weeks 1+2, not 219 (2.4 times as many):

ADD to ABSTRACT. Now show the same information but separately for 1st ED visit for b) mental health; c) substance use; d) ACSC. I'd expect multiplier c) to be higher than multiplier a) which is 2.4.

Response 4:
We have made the suggested changes to Figure 1, which now depicts timing of first visit both overall and for each of the three diagnosis types of interest. Additionally, we have calculated multipliers as suggested and present these findings in the Results section. We find these calculations to be an improvement over our previous presentation and quite helpful in interpreting Figure 1.

Location:
Page 8, 1st paragraph; Page 10, 1st paragraph; Figure 1;

Comment 5:
2.2 Present Table 1, as now, for all ED-visits and all ex-prisoners but also re-present Table 1 separately for the majority demographic among ex-prisoners, eg Males aged 18-34 years at index-release; and for Males aged 35-70 years at index release. In these sub-tables, provide number of ex-prisoners/persons in general population as well as number of ED-visits by these prisoners/persons. Edit row heading to 'mean age at ED-visit' as older ex-prisoners will tend to have more ED-visits than older compatriots.

Response 5:
Unfortunately, limitations in our data preclude a statement of the number of unique individuals in the general populations who accounted for the ED visits recorded. It is for this reason that Table 1 presents demographics and visit characteristics at the level of the visit (rather than at the level of the individual).

We have edited Table 1 to more precisely present age values as suggested by the Reviewer.

Location:
Table 1

Comment 6:
3. REPEAT Table 3 for males only. Repeat Table 3 for males aged 18-34 years only. Repeat Table 3 for males aged 35-70 years only. Do all inferences stand?
The reason for above suggestion is that I’m very sceptical about assumed age-linearity for all three outcomes. I’d much prefer to fit indicator variables such as for 18-24 years versus 25-34 years (as baseline) vs 35-44 years, 45-54 years, 55-64 years, and 65-70 years.

Response 6:
We agree with the reviewer that delving more deeply into our findings is an important next step. However, during the course of this analysis, we have opted not to pursue a secondary analysis stratified by age as it was deemed beyond the scope of the initial research question. We have reproduced Table 1 stratified by age as recommended by the reviewer. We have uploaded these supplemental tables as an Appendix.

Location:
Appendix

Comment 7:
Discussion does not explain why Hospital B is the more obvious one for ED-visits by reason of mental health or substance use (for which hospital C is relatively shunned). Zip code seems to suggest that mental health and ACSC visits are more likely in high population density locations (if I understand the covariate correctly - little Discussion by authors).

Response 7:
The reviewer correctly notes that mental health and substance use visits were more common at Hospital B. Hospital B is the state’s large, urban, tertiary care hospital and is located closest to the state’s correctional facility among the three study hospitals. Both factors may contribute to use of the ED for these conditions. In the authors’ experience, the ED at Hospital B typically receives higher acuity patients including those with overdose, intoxication or other urgent mental health issues. We have noted the nature of Hospital B in the Methods section.

Regarding our use of zip code population, we do describe the inclusion of this covariate in the Methods section. Given space limitations, we have opted to forego greater discussion of the association between hospital location/urbanicity and ED utilization though this would be of interest for future inquiry.

Location:
Page 5, last paragraph; Page 7, last paragraph

Comment 8:
The fact that authors made elementary errors in section 1 above makes me a little nervous of their correct use of more sophisticated statistical methods. Hence the need to see repeats of Table 3 to allow reader to have greater confidence that interactions are properly handled & likewise whether age is best modelled as linear effect. NB Multifactorial, not multivariate.

Response 8:
We appreciate the reviewers concerns but respectfully disagree. The elementary errors referred to above required only minor revisions to clarify our Methods as described in Response 1. The sophisticated statistical methods underlying our findings were designed and implemented by multidisciplinary group with advanced
training in the techniques employed (Christina Andrews, PhD, MSW, Traci Green, PhD, MSc, Peter Friedmann, MD, MPH and Joseph Frank MD, MPH). All assumptions and interactions were appropriately examined as described in the Methods section. Decisions regarding the handling of specific covariates were made purposefully and we are confident in the accuracy of our findings.

We would be willing to pursue the suggested revisions to our modeling strategy but would kindly request a short extension. All authors have relocated to new institutions since the initial analysis and drafting of the manuscript, and we have not yet been able to secure time for Dr. Andrews to resume her efforts as the study’s primary programmer.

Finally, we are reassured by the fact that Reviewers 2 & 3 appear to approve of our analyses as presented and the improvements made to the manuscript during the first round of revisions.

Referee 2 (Jaimie P. Meyer):
Comment 1: The authors did an excellent job of addressing the many issues raised by the reviewers from the previous review. The manuscript is now much clearer and better written. While there remain limitations, particularly the lack of individually identifiable data for some of the datasets, the authors now adequately address this issue in the Discussion section. No further revisions suggested at this time.

Response 1: We appreciate the referee’s thoughtful review initially and repeated review of our work.