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
April 3, 2013

Dear Ms. Costoy

Thank you for your review of our manuscript entitled “Emergency department utilization among recently released prisoners: a retrospective cohort study”. We appreciate the thoughtful suggestions of the reviewers and have incorporated their suggestions in the revised manuscript. To summarize major revisions, we have added a descriptive analysis of the ex-prisoner cohort studied and, where feasible, a more detailed description of patterns of ED utilization. We have revised the Background to more clearly lay out the rationale for the study. Finally, we have worked to clarify the comparison being made in this analysis (i.e. diagnosis-specific proportions of ED visits rather than rates of ED visits) and to interpret our findings accordingly.

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

Executive Editor Requests:

Comment:
The Executive Editor has also requested for you to include the following:
Full name of the Institutional Committee that granted ethical approval for this study.
Response:
The full name of the study’s Institutional Review Board has been added to the text. We apologize for this oversight.
Location:
Page 8, last paragraph

Referee #1 (Sheila Bird):

Comment 1:
The utilization discussed is within the first year post-release, and this should be clear from Abstract.
Response 1:
This is an important point, and we have revised the text of the Methods in the Abstract to state this explicitly.
Location:
Abstract

Comment 2:
Methods do not clearly explain how the authors distinguished & analysed the following:
i) 1st ED admission
ii) 1st mental-health-related ED admission
iii) 1st substance-misuse-related ED admission
iv) 1st ACSC-related ED admission
v) Repeated ED admissions per ex-prisoner
vi) Repeated cause-specific ED admissions per ex-prisoner.
The authors appear to have analysed repeated admissions but how they allowed for the induced within-prisoner correlation structure is not – especially as, in Discussion (p12), repeated events per individual were not available to the authors for the reference population. However, I assume that the time-sequence of subsequent ED-admissions was available for ex-prisoners.

Response 2:
We have added additional analyses examining the timing of first ED visits. However, given limitations in our data stemming from the human subjects protections put in place by our institutional review board, we were not able to examine repeated visits and so parts ii-vi are not currently feasible. Our models accounted for clustering at the level of the ZIP code but not at the level of the individual ex-prisoner.

Location:
Page 9, 1st paragraph

Comment 3:
Methods & Results should clearly distinguish when population-rates are/are not being taken into account. It would seem that TABLE 2 does take reference individuals into account BUT for how long . . . for comparability, the reference population might have been followed up for 1 year from their 1st birthday in 2008 to ensure that only 1-year’s data were analysed per control-subject.

Response 3:
In this study, we have compared diagnosis-specific proportions of ED visits by the ex-prisoner group to that of the general population. We are unable to examine visit rates in either population given the data available. We have made revisions throughout the manuscript to emphasize the nature of the comparison and its limitations.

Location:
N/A

Comment 4:
Unacceptably, Table 2 does not document all-covariates and their associated odds ratios that were adjusted for, nor does it explain how each covariate was coded . . . linear effect of age might have been better reported as effect per 10 years of age (rather than per single year).

Response 4:
We have revised Table 2 to include all covariates for our three models. Additionally, we have added explanatory text in the Methods section to clarify how all covariates were coded.

Location:
Pages 6-7; Table 2

Comment 5:
The subject-matter is important but the authors could do better with the data they hold, and should be encouraged so to do. In particular, analyse each of i) to vi) without heed to controls; report admission rates in first year post-discharge per 1,000 pys for a) Males [# males; # person-years; # relevant ED-admissions; # deaths]
b) Females
c) Males aged 18-34 years
d) Males aged 35-44 years
e) Males aged 45-54 years
f) Males aged 55+ years
g) White males
h) Black males
i) Latino males
j) Other-ethnicity-males

Response 5:
As noted, we are unable to examine ED visit rates. We also have not linked these data to state death records (see Response 6 below). Where feasible, we pursued the above analyses. We were able to describe time to first visit, stratified as suggested. We present the most salient findings from these analyses in a new paragraph in the Results section titled “Description of ex-prisoner visits”.

Location:
Page 9, 2nd paragraph

Comment 6:
In short, basic descriptive data are poorly reported. It is not even clear that authors have linked to the state’s deaths register to establish the survival-status of each released-prisoners at 1 year after index-release and, if dead, date & cause of death.

Response 6:
It is true that our analysis does not include linkage to death records and so we are unable to describe mortality rates in our study population. As the focus of the current study is emergency department utilization as a relevant outcome in itself, mortality is beyond the scope of this work, though certainly an important next step for this work.

Location:
N/A

Comment 7:
Methods do not discuss how re-incarceration of previously-released prisoners was dealt with. The answer may be ‘ignored’ but say so & if possible indicate the prison-re-admission rate for subgroups a) to j) and 1-year death-rates OR explain why you can’t do so.

Response 7:
Our models do not account for re-incarceration during the year following the index release during the study period. Of the 5,145 ED visits by the ex-prisoner cohort, <1% of visits occurred while the individual was re-incarcerated and so we do not believe these visits are likely to have a large impact on our findings. We have revised the Methods to provide greater detail on this point.

Location:
Page 7, 2nd paragraph

Comment 8:
Paper is well-referenced and authors are correct that there is too little published on state or national basis about cause-specific hospitalisations of ex-prisoners. Merrall et al. (2012)
have recently published on the cause-specific hospitalizations of Scotland’s (nearly 70,000) drug-treatment clients recruited & followed up in 1996-2006. Merrill gained surprisingly little from careful analysis of repeated episodes versus concentration on 1st.

Response 8:
This is a very interesting point. We appreciate the direction to this important study. With this recommendation in mind and within the constraints of the available data, we have added an analysis of first visits and now describe characteristics associated with a first visit within 2 weeks of release from prison.

Location:
Page 9, 2nd paragraph

Comment 9:
Initial p-values in Abstract (relative to general population) owe more the sex. Ethnicity and age demographic eccentricity of prisoners than to anything else. Authors could have focused more keenly on hospitalisations within 1st 4 or 12 weeks of release versus rest of first year: does hospitalisation pattern mimic DRD/suicide pattern?

Response 9:
As noted above, we have added a descriptive analysis of the timing of first visits as well as a Figure to display these findings.

Location:
Figure 1

Comment 10:
TABLES need to quote basic data, not just % or OR (95% CIs).

Response 10:
The suggested changes have been made in Table 1, which now contains basic data detailing the demographic characteristics and primary diagnoses of ED visits.

Location:
Table 1

Referee #2 (Margot Kushel):
Comment 1:
Major Compulsory Revisions:
The authors should clarify, throughout the manuscript, that the unit of analysis throughout is the ED visit. With this, the authors are unable to comment on rates of visits per person.

Response 1:
This is an important point and we have made revisions throughout the manuscript to highlight the nature of the comparison between ex-prisoner and general population groups.

Location:
Pages 6-7

Comment 2:
The manuscript would be greatly improved by improving the clarity of the research question. This manuscript described the comparative proportion of all ED visits for former prisoners
(as compared to the general population) for three classes of conditions (mental health visits, substance abuse visits, ambulatory care sensitive conditions). The introduction led me to believe that the study would examine rates of visits, not comparative proportions of visits for selected conditions.

Response 2:
We have revised the Background section to provide additional context for our study question. Additionally, we have restated the study’s aims to clarify the comparison of proportions of visits between the ex-prisoner and general population groups.

Location:
Pages 4-5

Comment 3:
The finding of such a small increase in proportion of visits for ACSC conditions is somewhat surprising; the authors should be more modest about conclusions drawn about ACSC conditions as the finding barely reached statistical significance. This could potentially be due to crowding out by high levels of other causes of ED visits (e.g. unintentional injuries) which could be explored. However, the authors should consider deemphasizing this finding in the discussion as the effect size is very small.

Response 3:
We have added a sentence to the Discussion to note the small effect size of this association.

Location:
Page 12, last paragraph

Comment 4:
It is difficult to interpret the meaning of the elevated proportion of visits for these three causes without knowing what made up the other reasons for admissions. For example, if former prisoners had higher absolute rates of visits for unintentional injuries than the general population (see Wang et al AJPH 2012), then the relative proportion of visits for ACSC could be lower than expected among former prisoners. The authors should be careful to not confuse rates of ED visits with comparative proportions of total visits.

Response 4:
We have revised the text in several places to better emphasize the comparison of proportions in our analysis. We have added text to the Limitations section to highlight this point.

Location:
Page 15, 1st paragraph

Comment 5:
The authors could improve the clarity of the writing throughout by reducing their use of the passive voice and by being clear as to what are the relevant comparisons.

Response 5:
We have reduced the use of passive voice throughout the manuscript with particular attention paid to the Methods section. As noted above, we made substantial revisions to clarify the comparisons being made and their interpretations.

Location:
Comment 6:

Minor essential revisions
The authors make statements about the proportion of visits by men and African-Americans. If the authors would like to include these, they should frame them for the reader by noting what the proportion of prisoners who were in these groups. While a larger proportion of visits to the ED among former prisoners were by men, it is unclear if this reflects the proportion of men among the former prisoners. What proportion of former prisoners in this sample were men?

Response 6:
With the addition of a descriptive analysis of the ex-prisoner cohort, we believe the revised manuscript better addresses this issue. Additionally, when comparing visits between ex-prisoners and the general population, we now note that ex-prisoner visits “reflect the composition of the ex-prisoner population”.

Location:
Pages 9-10

Referee #3 (Jaimie P. Meyer):
Comment 1:

Major Revisions
While the Background section gives a nice overview of the CJS, it does not make a clear enough argument for why one should specifically examine ED use in this population. Is it an issue of equitable distribution of limited resources? Cost? Cost-effectiveness? Or a marker of need in an otherwise vulnerable population? Or some combination?

Response 1:
We agree with the reviewer that there are multiple compelling reasons to study ED utilization by this population. The authors pursued this question with interest in both the potential negative impact of increased ED utilization on care continuity and quality as well as the potential effects on overcrowding and costs for health systems. We have added text to the Background to provide this context for the study question.

Location:
Page 4, 2nd paragraph

Comment 2:

Methods section
Under Study Population, missing is an overview of the study population. It would be helpful to give a brief description of the criminal justice system in Rhode Island, how it is organized (jails, prisons, healthcare delivery), and some general overview of the demographics of the CJS population.

Response 2:
This is an excellent point, particularly as the state of Rhode Island and its correctional system are uniquely suited to the present analysis. Rhode operates a single correctional campus for all jail and prison inmates located several miles from the
main medical center. We have added this overview in the Methods as well as a demographic description of the population in the Results.

**Location:**
Page 5; Pages 9-10

**Comment 3:**
The existing paragraph under “Study Population” should be retitled Study Protocol. It is a bit confusing how many separate datasets were used and which were merged with which. An accompanying figure or diagram may help clarify. The authors might also consider labeling each of the datasets (A, B, C, D) or (1, 2, 3, 4) for ease of reference.

**Response 3:**
This suggestion was very helpful. We have renamed this section of the Methods and identified each of 4 data sources with a label as suggested (i.e. A, B, C & D)

**Location:**
Pages 5-6

**Comment 4:**
Some key information was missing from this section:
1) How was the chart review performed? What information was extracted and how? By whom?

**Response 4:**
Text has been added to the Methods section to describe data extraction procedures. Additionally, we now acknowledge in the Limitations that an individual-level chart review was not part of our data collection plan.

**Location:**
Pages 5-6; Page 14, 2nd paragraph

**Comment 5:**
2) Privacy protections. Was IRB approval obtained from the Department of Corrections? Informed consent from participants (I’m assuming not, but how was that rationalized)? What other measures were in place to protect prisoners given that the initial dataset contained unique identifiers? Was data deidentified prior to analysis? The sentence on IRB approval from the hospital system should be moved from the Data Analysis to the Methods section.

**Response 5:**
IRB approval was obtained both from the Miriam Hospital and from the correctional system. Informed consent was not obtained. As the record review was retrospective, it was determined by the IRB that such consent would not have been feasible. A sentence has been added to the Methods section to clarify the study’s IRB approval. Data was de-identified prior to analysis as a condition of IRB approval.

**Location:**
Page 9, 1st paragraph

**Comment 6:**
Results section
It is concerning that ED visits for ex-prisoners were examined over 2 years, while those for the general population were examined over 3 years. This difference in denominators makes it difficult to draw meaningful comparisons between the two groups.

**Response 6:**
The 3-year time frame was chosen for the general population group to encompass the entire period available for utilization by the ex-prisoner cohort. Individuals released between 1/1/07 and 12/31/08 were included in the study. Visits during the year after release were sampled, spanning the 3-year period from 1/1/07-12/31/09. Ex-prisoner visits are not evenly distributed across the 3-year time period though we aimed to address this by adjusting for year of visit in our models. We did not have an a priori hypothesis positing a change in proportions of across study years. Additionally, we compared proportions of visits rather than utilization rates or total utilization and so the denominator in both groups is “all visits”.

**Comment 7:**
It seems there would be a great deal of collinearity among explanatory variables, given that ex-prisoners are likely to be younger, male, and Black, compared to the general population. Were interaction terms included in the model? Or, at a minimum, were explanatory variables checked for collinearity? It would be nice to know what proportion of the outcome variance and model fit was due to ex-prisoner status.

**Response 7:**
We explored interaction terms based on a priori hypotheses of effect modification. We found no statistically significant interactions and so these terms were not included in the models reported in the manuscript. A sentence has been added to the Methods to reflect this aspect of the analysis. Additionally, we conducted checks for collinearity, which was particularly problematic for available ZIP code-level variables. We included variables in our final models after consideration of the impact of collinearity. Finally, model fit was assessed iteratively using the likelihood ratio test. As the aim of this analysis was to estimate the effect of ex-prisoner status on ED utilization rather than to develop a model to maximally explain variability in ED utilization, we have chosen to not report measures of model fit in the manuscript.

**Comment 8:**
Discussion
While the Discussion accurately summarizes the findings and places them in the context of existing literature, it remains somewhat superficial. It would be more provocative to address some of the following issues:
Some conditions resulting in ED visits are more common among people in the CJS and the authors accurately describe this. What is important, though, is that they are under-managed in the community, especially during the transition from the CJS. It is critical to point out that ED visits by ex-prisoners are not necessarily inappropriate- but likely reflect real need. This is particularly key for an emergency medicine journal readership.
Response 8:
We agree wholeheartedly with the reviewers comment and appreciate the eye toward the interests of the journal’s readership. We have added text in the Discussion to emphasize this point.

Location:
Page 14, 2nd paragraph

Comment 9:
To that end, the authors suggest the need for “ex-prisoner-specific management of chronic conditions.” What does this mean?
Response 9:
This text was unclear and has been revised to emphasize the importance of care coordination during community re-entry.

Location:
Page 13, 3rd paragraph

Comment 10:
Minor Essential Revisions
The term “recently released ex-prisoners” is used throughout (including the title) but is redundant. Consider instead: released prisoners, former prisoners, prisoners transitioning to the community, or (simply) ex-prisoners.

Response 10:
We now use the terms “recently released prisoners” or “ex-prisoners” throughout the manuscript.

Location:
Title page

Comment 11:
Use consistent and appropriate terminology: Substance use (or substance use disorders or substance abuse only when indicated), instead of substance use conditions, diseases of addiction, addiction; Mental disorders, instead of mental health, mental illness; Black or Latino, instead of minority (Results section, 1st paragraph)

Response 11:
The revised manuscript consistently used the terms “mental health disorder” and “substance use disorder” when referring to the diagnoses of interest. Also, the manuscript uses the term “racial/ethnic minority” when appropriate and “black” and “Hispanic” when describing the Results.

Location:
Pages 8-10

Comment 12:
In the 3rd line of the Background section, the cited references relate to prisoners and releases, not “probationers and parolees”. Those 4 terms are distinct concepts.

Response 12:
We have replaced the terms “probationers and parolees” with “ex-prisoners” for both accuracy with cited references and consistency throughout the manuscript.
Comment 13:
It is unclear from the Methods section which dataset provided the Zip code data.
Response 13:
In the “Study protocol/Data sources” section, we have clarified the source of ZIP code data for both ex-prisoner and general population groups.

Location:
Pages 5-6

Comment 14:
Would state up-front that aggregate (rather than individual-level) data was used on ED visits to allow for comparisons between ex-prisoners and the general population. Otherwise, the reader is left wondering until the limitations section.
Response 14:
This is an important point and key to interpreting the findings of our study. We have made revisions throughout the Methods section to address this point.

Location:
Page 8, 2nd paragraph

Comment 15:
Table 1 should include the N for each cell, with % to the 10th of a decimal place. The text should not repeat the entire table, but rather summarize key points and report %s as rounded whole numbers. Reported are “adjusted” OR, not ORs, and columns should be relabeled.
Response 15:
These points are appreciated and the suggested revisions have been made.

Location:
Tables 1 & 2

Comment 16:
Greater attention should be paid to the use of “visits” vs. “visitors.” For example, Table 1 is titled “Characteristics of Emergency Department Visits” (but describes the visitors) “by Ex-prisoner and General Population Groups” (but the columns are titled visits.) Results section last sentence: “Visits...were also more likely to present for treatment” (but should be visitors). This is confusing throughout the text.
Response 16:
Table 1 describes characteristics of individuals but does so at the level of visit, which is the comparison made in the study’s models. For instance, in Table 1, 15.1% of visits by ex-prisoners were made by female ex-prisoners. Revisions have been made throughout the manuscript to emphasize the fact that the comparison is being made at the level of the visit. The last sentence in the Results section has been revised.

Location:
Table 1; Page 11, 2nd paragraph

Comment 17:
The limitations section is very clearly written. Would also discuss issues of generalizability, limited ability to assess other individual-level factors (comorbidities, homelessness, whether or not people had a primary care provider), and overlap—since visits were analyzed in aggregate, did not describe whether multiple visits were contributed from a single individual.

Response 17:
The suggested additions to the Limitations section have been made.
Location:
Pages 14-15

Comment 18:
Discretionary Revisions
Consider including a list (Table or textbox) of major diagnoses associated with each of the three outcome categories of visits.

Response 18:
We agree with the reviewer that additional detail on major diagnoses will provide useful context for the ED utilization described in this manuscript. As we plan to conduct more detailed analyses of specific diagnoses as a next step in this project, we believe that such an analysis is beyond the scope of the current project.
Location:
N/A

Comment 19:
Expand the Analysis section. Was the model checked for fit?

Response 19:
See Response 7 above.
Location:
N/A

Comment 20:
Would try to flush out the “ex-prisoner visits” a little more, at least in the text, because individual-level and identified data was available for this group. This would be a great addition to existing literature on transition from the CJS. Were people mostly transitioning to communities from jail or prison? What was the mean duration of incarceration? What was the mean time to the first ED visit? How many visits did individuals have (and repeat ED visits)? How many people were reincarcerated? What proportion of their ED visits resulted in hospitalization?

Response 20:
We appreciate the reviewer’s recommendations on ways to more fully capitalize on the opportunities available in our dataset. We have added two paragraphs at the beginning of the Results section to address the noted opportunities, when possible. Within the limitations in the data resulting from subject de-identification, we were able to provide demographic and correctional data on the ex-prisoner cohort and to further describe the timing of ED visits. It is important to note that we were not able to fully examine repeated visits nor were we able to identify ED visits resulting in hospitalization.
Location:
Comment 21:
The authors provide a nice description of the implications of the Affordable Care Act for ED use. It would be interesting to expand that section to discuss other cost-cutting measures that attempt to divert people away from prisons/jails and into community-based settings, i.e. though drug court, mental health court, that may further impact EDs. One might also consider mentioning health reform targeted at reducing ED overcrowding. This would resonate with the emergency medicine journal audience.

Response 21:
We have revised this text to draw reference to the potential impact of the Affordable Care Act on ED overcrowding.

Location:
Page 14, 2nd paragraph