Article details: 2015-0098	
Title	**High mortality over 12 years of follow up in people admitted to provincial custody in Ontario: A retrospective cohort study**
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Reviewer 1	Lynn Ann Stewart
Institution	
General comments (author response in bold)	1. Last paragraph page 1. ..about 1 in 250 … This number seems very high. How is this calculated? There will be multiple admissions by some offenders each year which could inflate the number. The incarceration rate is 117 per 100,000, calculated based on the 2008 population. Please check this number. **We agree that this number is high, however, we are confident that it is a reasonable estimate of the proportion of Canadians who are incarcerated or detained in Canada each year.** **The ratio of individuals to admissions in Ontario provincial facilities each year is 0.6 (i.e. 60,000 persons have 100,000 admissions). We have extrapolated this ratio to the number of admissions to custody in Canada (250,000), i.e. 0.6 x 250,000 =150,000. We appreciate that the ratio may not be consistent across jurisdictions, however, if the correct ratio is 0.5, the number is 1 in 288, and if the correct ratio is 0.7, the number is 1 in 205. We think therefore that 1 in 250 is a conservative estimate, especially since these estimates use the total population of ~36,000,000 as the denominator (http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo10a-eng.htm), as opposed to the total population of adults (~30,000,000).** **The incarceration rate of 117 per 100,000 is the average number of people in custody on any given day, which cannot be compared directly with the number in custody over the course of a year, especially for provincial facilities in which the mean length of stay is only weeks.** 2. Page 2 second paragraph. There is a recent publication in CMAJOpen on a survey on health condition of incoming federal offenders, see Stewart et al., 2015. Self-Reported Chronic Health Conditions among Incoming Canadian Federally-Sentenced Male Inmates **We have added a reference to this publication.** 3. Page 2 second para. Regarding mortality in particular, several reports have examined deaths in custody, and have noted high rates of death… I think this could be contextualised. The numbers are high relative to what? There are actually relatively few deaths in custody in a given year. **We have revised this sentence for accuracy and clarity.** 4. I note that length of time in custody does not appear to be related to later mortality, indeed there is a slight trend for those in custody longer to have lower mortality rates. This, in general, is mentioned by the authors but perhaps the implications of this finding could be drawn out. Some commentators maintain that incarceration itself is a deleterious to heath but this study suggests that in the provincial system the risk factors are more individual, possibly related to life style and social determinants other than incarceration. It is also interesting that income quartile or does not appear to be associated with mortality. This is perhaps bears some discussion. It may mean that the individuals who experience incarceration are bringing their risk factors with them into the neighbourhoods in which they live on release, and that poverty of the neighbourhood is not a key risk factor for this outcome. **We agree that the apparently lower mortality rate in those with long periods of incarceration is interesting. As we did not calculate SMRs by number of incarcerations, total time in provincial custody or whether a person was**

	transferred to federal custody, it is difficult to tell whether this association is confounded by age. We have decided to not pursue such analyses and to not discuss the apparent differences in mortality rates by length of incarceration, since exploring this association is not within the objectives of the study. However, we have added a note about this apparent trend in the second paragraph of the Interpretation section. We did not comment on the lack of a trend by income quintile. 5. Figure 1. Relative risk of death in persons admitted to provincial custody in 2000 compared to the general population,* by age group and gender. Am I reading this chart wrong? I don't see the comparative indicators for mortality rate in the general population. Perhaps the label at the bottom is wrong indicating men and women instead of general population and incarcerated. **The relative risk is calculated as the ratio of the risk of death in those who were incarcerated in provincial facilities in 2000 to the risk of death in the general population. The labels are correct, as we separately examined the relative risk for men and women.** 6. p. Standardized to the Ontario age distribution, the mortality ratio (SMR) for cohort members was 4.0 (95% CI 3.9, 4.1). I think for some readers it will be necessary to demonstrate briefly how you calculated the standardised mortality ratio and explain its meaning.)…. This could be added to the methods and explained there. When you draw attention to it in the text, instead of citing the number, can you say it is __times higher risk, in other words, real world language. We have added more detail regarding the calculation of the SMR to the Analyses paragraph of the Methods section. 7. p. 8. Mental disorders—what would constitute death by mental disorders? Or legal intervention? Also, some of the numbers here are really low for making calculations and could be misleading. These categories are defined by the International Classification of Disease. Deaths by mental disorders include deaths due to psychosis, neurotic disorders, personality disorders, other nonpsychotic mental disorders, and mental retardation. Deaths due to legal intervention are "injuries inflicted by the police or other law-enforcing agents, including military on duty, in the course of arresting or attempting to arrest lawbreakers, suppressing disturbances, maintaining order, and other legal action" as well as legal execution. We have not specified these explanations in the text, as this classification system is widely accepted and information on the ICD categories is easily available. Regarding the low numbers, indirect adjustment is an appropriate method to use when study groups are small so that stratum-specific rates are considered unstable. The 95% confidence intervals provide valuable information for the reader regarding the precision of the point estimates, and in fact most of the confidence intervals for the SMRs in Table 2 are quite narrow. Interpretation: 8. p. 9. The high mortality immediately after release due to preventable health conditions (overdose and suicide) is a very important finding and would be extremely important for parole and probation officers to know so that they can counsel and monitor this – can this be included in the discussion with the recommendation that you have already made that this provides an opportunity for intervention while incarcerated? We have added a comment in the second paragraph of the Interpretation section regarding the potential involvement of probation and parole programs in the prevention of death. 9. Can a comment be made on the differences in the results for women? There is so little work published in the area I believe it's worth the emphasis. We have commented in the Results section on the differences in life expectancy by gender, and stated that the distribution of causes of death is similar for men and women. We have added a comment regarding the high SMR for women in the

	second paragraph of the Interpretation section. 10. Regarding limitations. Can a note be added that delineates that these results are for provincial offenders and that although suggestive they should not be assumed to be true of offenders in the federal system who would be incarcerated much longer. We have added a comment regarding our inability to examine the mortality rate and specific causes of death post-release in persons in federal custody.
Reviewer 2	Ruth Elwood-Martin
Institution	
General comments (author response in bold)	Comments about the Demographic characteristics, table 1: 1. I am interested in the apparently higher MR in Aboriginal and White men and women, compared to other ethnicities. This finding is not commented upon in the results or discussion, and yet I think this is an intriguing finding and might have implications for health outcomes in correctional populations in other provinces because of higher incarceration rates of indigenous peoples in other provinces. We have commented on this in the second paragraph of the Interpretation section. 2. I wonder if 'ethnicity' is the correct label for this demographic characteristic instead of 'race'? This variable is self-reported by persons at the time of admission to custody. Correctional staff specifically ask people what their race is, and we think it is important to use the language that was used when asking the question. We have specified this in the Methods section. 3. For the admissions to provincial custody, men MR decrease for increased admissions to custody, and women MR increase with increased admissions to custody. Is this finding worth exploring further in the results and/or discussion? Similar to our response to Dr. Stewart's comment #4, this is not within the objectives of our study, and we did not conduct specific analyses to compare mortality rates by self-reported race. However, we have added a comment about this apparent difference in the second paragraph of the Interpretation section. Comments about the Methods section: 4. I was confused about where the 'Expected Deaths' calculations came from in Table. 2. I assume that the last 2 sentences in the paragraph entitled, 'Analyses', relate to the 'Expected Deaths' in Table 2, but I think that this could be explained more, and the words 'Expected Deaths' used for clarity in these sentences. As noted in response to Dr. Stewart's comment #6, we have added further detail regarding the calculation of expected deaths and standardized mortality ratios in the Methods section. Comments about the Results: 5. In the last sentence of the 1st paragraph, I am interested to know if it is common practice for linkage studies to have 7% (3317/44849) of individuals to have more than 1 IKN, or is this finding unusual and unique to linkage studies involving correctional populations? We have added a comment in the limitations section regarding this being a high percentage of persons with multiple IKNs.
Reviewer 3	
Institution	
General comments (author response in bold)	