Review of: "Seroprevalence and associated factors of HIV and Hepatitis C in Brazilian high-security prisons: A state-wide epidemiological study"

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Review of Seroprevalence and associated factors of HIV and Hepatitis C in Brazilian high-security prisons: A state-wide epidemiological study

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This is a very informative and wonderful article, congratulations to the authors. The study aimed at exploring the seroprevalence of HIV and HCV infections and associated risk factors in male inmates in 11 maximum security prisons in Brazil. The findings suggested that prevalence of HIV and HCV among high security detainees in Brazil was considerably low compared to the global and regional estimates in prisons. Moreover, the authors found that risk factors associated with HIV infection included not receiving intimate visits, history of sexually transmitted infections and exposure to HIV preventive campaigns. In regard to HCV infection, increasing age, criminal recidivism, and the use of injectable drugs were found to be associated with anti-HCV seroprevalence. Findings from this study provide valuable insight into nationwide HIV and HCV epidemics among incarcerated persons in Brazil. In particular, information on both behavioral and biological factors associated with HIV and HCV infections among incarcerated people helps to identify gaps that need to be addressed for scaling up prevention, testing and treatment services across the correctional systems in Brazil.

As in other epidemiological studies, this study has many strengths and limitations. Among many strengths of this article, it highlights the global situation of HCV and HIV infections in the general population and in the population with higher risk with a particular emphasis on incarcerated individuals. According to the previous studies cited by the authors, people living in prisons are 48 to 69 times more likely to be infected with HCV and 7 to 12 times more likely to be infected with HIV when compared to the general population (1). The possible explanations behind this exacerbated risk of HIV and HCV infection in the correctional systems are also explained. Although the authors describe the global epidemiology of HCV and HIV in prisons, information on such infections among the general and incarcerated population in Brazil is missing in the introduction. In addition, it would be beneficial to know if there are any existing prevention

and control programs for HCV and HIV infections in the communities to serve people with higher risk such as people who use injection drugs (PWID), gay, bisexual and other men who have sex with men (gbMSM), and sex workers; or if there are any current prison-based strategies to prevent and treat blood-borne and sexually transmitted infections in Brazil. As such, the study rationale seems to be somewhat incomplete with no background information on the HCV and HIV care cascades in the correctional facilities in Brazil and underscore the potential gap in the management of HCV and HIV in Brazil.

Concerning methods, description of sampling methodology applied in the participants' recruitment is well appreciated as it could help reducing selection bias which may occur when sampling strategy is based on non-probability sampling, for example. The criteria of selecting 11 out of 23 institutions were also described. However, we expect more information on the implications of this selection criterion in inferring the validity of study. In addition, we are curious to know why women were not included in this study. A couple of questions arise from this instance whether Brazil does not have women who are incarcerated or there are very few women in each institution. The absence of women in the study population results in a partial picture of the epidemiology of HIV and HCV infections in Brazil. Moreover, we believe that this is a cross-sectional study, but it was not clearly elucidated as such.
For study participants' recruitment and data collection procedures, the inclusion criteria is clearly described and it is helpful for readers that the targeted age of participants is shown. However, it is not clear whether the interviews were conducted by the prison staff or by the research team or if efforts to ensure privacy were given. Further, in many developing countries, serological tests were shown to have many false negatives or false positives and therefore it may bias the findings. This was the case of countries in the sub-Saharan Africa where the variation of rate of nucleic acid test (NAT) detection in anti-HCV reactive samples was between 0-100% (2). The authors do note that not using NAT is a limitation which could overestimate the prevalence of HCV infection, although the specificity and sensitivity of tests used in this study are not reported.

When it comes to the variables used in the analysis, potential risk factors associated with HIV and HCV infections were presented and discussed. However, there are variables that need further clarification. Specifically, the variables describing the behaviors of inmates such as alcohol use and drug use, should have been specified clearly about the timing of their practices. It is unclear from the article if the study participants were reporting about their practices in the present or in the past. For readers, the timeframe for each behavior is important to better understand the association between the behaviors and the infections, and the situation inside the prisons.
Relating to results, tables are well prepared and interpreted with detailed information on the study participants and stratified by HIV or HCV infection status. However, we feel that both tables 1 and 2 presented several variables and some of the variables could be combined or excluded from the tables. Perhaps it would be better to group into variables in different characteristics such as socio-demographic,

behavioral and sexual characteristics. This could help in improving readability or interpretability. In addition, some variables could have been described with more than two categories to provide further insights. Age category is an example where only two categories 18-30 years old and over 30 years were presented. We expect to see how different age levels are associated with the risk of HIV or HCV infections. Furthermore, it would have been interesting to know whether HIV/HCV co-infection is present among inmates and its prevalence.

When reading the results from the multivariable model shown in tables 3 and 4, there is no information on how the authors have constructed the final multivariable model. It would help the readers to learn about the variable selection method that was used to construct the final multivariable model. In particular, it would be good to know which variables were included in the multivariable model and how they were treated. It is also unclear whether the authors have considered the effect of clustering resulting from their sampling design. Finally, the authors identified that three variables are associated with HIV infection. They are 1) history of STIs: we would like to know whether this self-reported history of STIs was in the last 12 months or earlier; 2) attended HIV preventive campaign: as there is no background information on the prevention programs, we would like to know whether these campaigns are ongoing or they attended them outside of the correctional systems; 3) receiving intimate visits: we find that there is a lack of information on routine intimate visits, therefore, we do not know how often inmates have a chance to receive a visitor. Similarly, there is a need for further clarification on the variables that were associated with HCV infection.

In the discussion, the goal of the study is clarified while it is not well specified earlier in the article. The authors present that the seroprevalence of HCV and HIV infections in their study was shown to be lower than the global estimation, but they do not provide any potential explanation for this discrepancy. The prevalence of HCV and HIV reported in this study are higher than the estimated prevalence in the general population, but not lower than that of other groups of population with higher risk such as gbMSM, females sex workers and PWID. In addition, it could be valuable to discuss possible reasons why prevalence of HCV and HIV among incarcerated persons may differ from other persons at higher risk for infections. The prevalence lower than expected could be explained by either selection bias resulting from the sampling design, or refusal of participation among people who were aware of their status or who were on treatment.

The older age presented as a risk factor of having HCV antibodies was explained as prolonged exposure to STIs. Authors are comparing HCV to other STIs while HCV transmission rate during sexual intercourse is rare in monogamous heterosexual relationship (3), unless this was considered with respect to gbMSM or persons with higher risk sexual practices. It is known that even in the general population, the age is often considered as a confounder or an effect modifier for other covariates in association to HCV infection, as older people might have been exposed to risk factors before they were aware of the preventive measures to reduce the risk of the infections. These notions of confounder and effect modifier are not presented

anywhere in discussion while it could have strengthened the interpretation of the results. Finally, it is commendable that limitations to this study include low number of positive cases for HCV and HIV as well as the lack of the confirmatory testing for HCV RNA which would provide information on active HCV infections. However, we expect consideration of other biases possible in this study such as recall bias, social desirability bias and other information bias associated to self-reported nature of data collection, particularly for sensitive information. This could bring clarity to study findings for readers and provide guidance for future studies.

To conclude, this study reports the prevalence of HIV and HCV infections and the associated socio-demographic and behavioral risk factors, and urges the government of Brazil to adopt a surveillance programs to monitor the circulation of viruses, to increase the number of interventions for prevention and control of HCV and HIV in the correctional facilities. We agree with the authors that the implementation of these measures in this type of high risk environment could contribute to targeted elimination of viral hepatitis and control of HIV as planned by WHO. Thus, as the authors suggest, adopting surveillance programs for HIV and HCV could monitor and control the circulation of viruses inside the correctional facilities as well as in the communities. In particular, adopting policies such as systematic opt-out screening on admission could advance the care cascade(4,5). For future studies, authors are suggested to consider limitations shown in this review.

References

1. Opitz-Welke A, Lehmann M, Seidel P, Konrad N. Medicine in the penal system. Dtsch Arztebl Int. 2018;115(48):808–14.
2. Graham CS, Swan T. A path to eradication of hepatitis C in low- and middle-income countries. Antiviral Res [Internet]. 2015;119:89–96. Available from: http://dx.doi.org/10.1016/j.antiviral.2015.01.004
3. Wuytack F, Lutje V, Jakobsen JC, Weiss KH, Flanagan P, Gethin G, et al. Sexual transmission of Hepatitis C Virus infection in a heterosexual population: A systematic review. HRB Open Res. 2018;1(May):10.
4. Galletly CL; Pinkerton SD; Petroll AE. CDC recommendations for opt-out testing and reactions to unanticipated HIV diagnoses. AIDS Patient Care STDS. 2008;23(3):189–93.
5. Kronfli N, Dussault C, Bartlett S, Fuchs D, Kaita K, Harland K, et al. Disparities in hepatitis C care across Canadian provincial prisons: Implications for hepatitis C micro-elimination. Can Liver J. 2021;4(3):292–310.