Reviewer’s report


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Reviewer: Ann Jolly

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BMC Infectious Diseases; Hepatitis B vaccination uptake in hard to reach population in Londonl a cross sectional study.

The authors report on a cross sectional study of hard to reach people recruited from day centres, homeless hostels and drug treatment centres across London, England. The cross sectional study was completed in preparation for a peer led intervention to improve links to health care within this group. The study aimed to describe the risk factors associated with incomplete vaccination for hepatitis B and the reasons for this being so. In addition to the risk factors the guideline for vaccination which includes recommendations for vaccination in four groups; those who have been imprisoned, people who have current or past IV drug use, liver disease, and/or HCV infection was also taken into account as a factor in likelihood of being vaccinated.

First, I would like to congratulate the authors on conducting this research in a very important population, and one that is often neglected. Also I recognise the challenges in researching these group of people.

Having said that there are some major issues in this paper which, when addressed will make it 1) much clearer, and 2) much more impactful.

The first issue is that of missing data. So a very typical marker of hard to reach people is just that - they don't know or are missing information - from both a health care standpoint and also from a health research standpoint. What may be very useful here is to give the reader as much description of these folks as possible so that they may be compared with the overall sample and most important with those whose vaccines are incomplete. To do that I would suggest reorganising Table 1 such that the columns show the percent of the 35 with unknown vaccine status clearly and they can be compared with others. You may find then that there are few differences between them and the ones who are under vaccinated and could even group them together. It looks as if this may be the case of the distribution of age groups and arrest/imprisonment status, where 61 or 46% of under vaccinated were imprisoned as were 40% of those with unknown vaccine status.

The second thing I think is to set some context for the vaccine and the homeless population you are looking at. There are two reasons for this; one is to set the scene as to the need for HBV vaccine in this group, and for the reader to evaluate the current study which will have an impact on the peer intervention. So in North America for some time now, hepatitis B has been regarded
as primarily sexually transmitted, and common also in household contacts of those who carry it, and universal vaccines were recommended in children routinely starting in the mid 1990's with a catch up program in teenagers. For this reason it would be helpful to contextualise the homeless folks a little better especially the women who if they sell sex may be at high risk of HBV infection. Of course injection drug users would be at very high risk of HBV and so they also would be a high priority to vaccinate. Also, people coming from other countries where HBV is endemic may expose other members of the general population so it would be helpful to have as high a vaccine rate as possible in the whole population. Another reason to contextualise the hard to reach population is so that we can better assess the reasons for not engaging in health care. Are there nurses or outreach workers who are out on the streets who provide medical care and counselling? What proportion of people who are on the street do not use the homeless facilities? What is the connection between sale and consumption of drugs, income, sex work and/or survival sex? What kinds of offences and what programmes are offered to those who have been imprisoned? I notice that the article seems very short, so the authors may wish to expand a little here.

The second issue has to do with the logistic regression models. First it is not clear to me how you decide which variables are statistically significantly associated with your outcome of under vaccination; In Table 3 you have a p value of 0.03 with imprisoned and arrested, but the confidence levels overlap 1 in both categories. As far as I know this is impossible for a simple logistic regression so you need to consult a statistician. Later on also in the discussion you say that imprisonment/arrest is not associated, line 257, this contradicts line 189.

I know you say you checked for collinearity but this seems contradicted in Table 2 where you have some independent variables which seem to me may be collinear. One of these is high alcohol and homelessness, in which I can see that a much higher proportion of people who consume alcohol frequently may be homeless compared with those who don't. In table 3 it also seems to me that homelessness may have resulted from drug use, or imprisonment without sufficient rehabilitation supports. Last extreme alcohol use can result in liver disease, so I think it would be helpful to explain how these factors may be inter related so as to arrive at a better risk profile of those needing to be vaccinated.

I agree with all your conclusions and I think you can go further in some aspects. The criteria in the Green Book for HBV vaccine in those with HCV or liver disease may not be useful in defining large populations who are under vaccinated because they are already in health care and are probably already they have been vaccinated. Second thing, it is great that people who meet the Green book criteria are more likely to be vaccinated, but sad that women are less likely, for the reasons you mention. This is even more worrying as women usually are engaged in health care for reproductive needs and so have more contact with the health system than do men.

It is a pity that there is not more detail on why people are under immunised. I think it safe to be a little more assertive in emphasizing that 80% were not offered it, which indicated that health care is suboptimal. If providers do not know that the client's lifestyle puts them at risk that shows inadequate knowledge of the patient, and 2) non provision in itself is an indicator of inadequate health care.
Minor details

Line 160. Discuss the limitations of omitting non responders from your analysis. Also explore use of multivariate missing imputation.

Line 167. The text is confusing with regards to odds ratios of increased or decreased vaccination rates. I would standardise the test by saying that xx factor was associated with higher rate of vaccination, or lower rates compared to the reference group. Using a double negative like "5 times decreased odds of an incomplete HBV vaccine" is difficult to interpret. So better to say that is was 5 times more protective against …" and then keep a consistent language.

Line 173 I wonder if smokers tend to have more health care visits than others and so are more likely to be given HBV vaccine.

Line 179 replace "… associated." with "associated with incomplete vaccination"

Line 179, Perhaps the reason that there was not an association with homelessness is that nearly all of the population were homeless.

Line 188 The confidence limits cross over 1, so check that this statement and statistics are correct.

Line 201 and 216; compensation for child care and transportation are usual barriers, so it would have been great to have these reasons prelisted in the questionnaire.

Line 288 replace "includes" with "include"

Line 241 Please given us a sentence on nurses' views from that study.

I think the paper will be dramatically improved and very helpful once the changes have been made.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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I recommend additional statistical review

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