Author’s response to reviews

Title: A comparison of licensed and un-licensed artisanal and small-scale gold miners (ASGM) in terms of socio-demographics, work profiles, and injury rates

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A comparison of licensed and un-licensed artisanal and small-scale gold miners (ASGM) in terms of socio-demographics, work profiles, and injury rates

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Editor Comments:

Please take into consideration of Reviewer 1 comments before resubmitting a revised manuscript. Pay special attention to Table 3 - please either report incident rates or defend the choice of incidence proportion. Additionally please provide a more detailed methods sections, especially with regard to data handling and statistical analysis.
RESPONSE: Dear Dr. Cavallari, thank you for this note and for handling our paper. Apologies for the delayed response (owing to other deadlines as well as the end of the academic teaching term responsibilities). We have carefully reviewed all the comments below and have made several changes. Taken together, and with the previous revision of this paper, we feel that the paper is a much stronger contribution. We provide itemized responses below to each query. We also provide two versions of the revised manuscript (one with changes tracked and the other is clean).

Reviewer reports:

Douglas Myers (Reviewer 1): I still have a few major concerns about this manuscript. Overall, it is not clear that the authors' Conclusions follow from their findings.

A main concern is the authors' focus on findings reported in Table 3. The authors have three statistically significant (a<0.05) findings. It seems to me that two of these (regarding number of episodes and experience) would likely become non-significant if they used information on work duration to report incidence rates which I believe they can do as they report rates in Tables 4 and 5. These associations seem likely confounded by employment duration (simply, time at risk). The authors did not explain why they did not report incidence rates in Table 3, as I asked in my first review.

RESPONSE: We thank the reviewer for stressing the importance of this particular facet of our paper. We decided to use Table 3 to simply report upon the number/percentage of events broken into key sub-categories, and then use Tables 4 and 5 to present rates for the most compelling Results. However, based on the comments here, we expanded the calculations performed to calculate rates for “number of episodes” and “work experience” and these are now provided in the Results section. In doing so, we show that injury rates between the licensed and unlicensed miners do not vary for “number of episodes” but that the injury rates do differ according to “work experience”. This offers a much clearer and more compelling result (and so a new Table 6 was created), and we thank the reviewer to encouraging us to delve deeper. The Discussion has been modified in a few sections to reflect this new finding, but also to address comments made above.

In addition, as for the "number of injury episodes" variable, the authors seem to report total episodes rather than number of people who experienced the respective number of injury episodes. I believe they indicate there were 5 episodes in which 5 or more episodes occurred rather than reporting that 1 person had experienced 5 episodes over their work history during the
study period. Individuals should be the unit of analysis here and I believe this result is therefore invalid (even setting aside any consideration of person-time).

RESPONSE: The reviewer is correct in that the variable was not well explained, and we thank them for catching this. To better clarify this particular variable, we modify the language in Table 3 and also better clarify the text in Section 3.3 in which we detail this information. The person-time component of this question is addressed above with new calculations provided in the Results section.

The third significant finding in Table 3, regarding use of PPE during the injury event, seems rather trivial as it is not known if PPE 1) was called for by the task done while injured or 2) relevant to the injury (i.e., might have prevented it). More appropriate questions would have directly addressed the needs, availability, use and enforcement policies regarding PPE independent of injury experiences. The authors seem to use results of this question as a substitute for the more appropriate questions that could have been asked.

RESPONSE: We agree that the question asked is challenged. The information was only gathered in cases where an injury was reported and so we do not know the proportion of miners who regularly wear PPE (only those who were injured). We adjust the Discussion to reflect the limitations of this particular question.

Concerns about the linking of injuries to the type of mine they worked in when the injury occurred remain. About 35% of the miners had worked in both licensed and non-licensed mines. The authors do not indicate whether they gathered injuries from the entire (up to) ten year history if this spanned mine types or if they restricted information on injuries to the current type of mining. Without more details pertaining to their survey, as I requested in my previous review, I cannot tell how things were done.

RESPONSE: In the Methods Section we referenced an earlier paper in which we provided great details on the study methods, though here we did highlight some notable design aspects. We mentioned that the survey captured the preceding 10 year period. Even if many miners moved between licensed and unlicensed sites, our survey was designed to link a particular injury event with the type of ASGM mine they were working at during the time of injury. We further clarified this particular point in the paper’s Discussion section.
From the Discussion:

"Perhaps the most striking finding of the current study was the difference between the licensed and unlicensed miners with respect to their injury rates. The incidence proportion of injury was 17.3% for those working in a licensed mine versus 40.3% for those working in an un-licensed mine. Focusing strictly on the male miners, the injury rate ratio was approximately 1.5 when comparing individuals working in an un-licensed mine (6.1 injuries per 100 person years) versus a licensed mine (4.2 injuries per 100 person years)."

Here, again, the authors use incidence proportion without any stated justification for not using incidence rates. They follow that with incidence rates demonstrating that they apparently could use rates but chose not to. If there's a reason they did not use rates in Table 3, this was not explained. Also, it seems they report results restricted to males here because the overall association, including both genders, was not statistically "striking."

RESPONSE: As per earlier comments we have modified this paragraph accordingly.

From the Conclusions:

"…first and foremost, small-scale miners are indistinguishable in their operations irrespective of their status (licensed or unlicensed)."

This, at a minimum would require a qualification: "…with respect to the variables gathered and the methods applied here…" or similar. To assert that the two types of mines are utterly indistinguishable in their operations based only on their data is a bit of a stretch. This however, is a relatively minor complaint about the conclusions.

"Thirdly, injury rates were significantly lower at licensed mining sites."

Frankly, I cannot identify any reported findings that support this statement. Overall injury incidence rates were not statistically lower. See comments above on Table 3, see Table 4.

"Finally, although the use of personal protective equipment was generally low among all small-scale miners, it was significantly lower among those working at unlicensed sites."

This claim also appears to be a stretch given their findings. They demonstrate that PPE was used less often at unlicensed mines when injury occurred. They did not report here the data needed to make such a statement that PPE use was lower overall at these sites. It's not hard to believe that
PPE use would be lower among non-licensed mine operations. But the wording here has to be scaled back to avoid going beyond their study design and findings.

RESPONSE: As per these comments and our re-review of the Conclusions section, we have removed it from the paper. The Abstract provides a nice summary of the work.

There are still many questions about the methodology that, at best, need clarification and, at worst, may undermine the conclusions, particularly those regarding differences in injury experience by type of mine.

RESPONSE: We thank the reviewer for identifying a number of features of the paper that warranted improvement. We feel that the changes made will better help readers understand the work and use it appropriately in the future.

Rodney Ehrlich, MBChB, PhD (Reviewer 2): I am satisfied with the revision and believe that the findings will prove useful in this under-researched area.

However, the article needs a rigorous English proofread to iron out some awkward or ungrammatical phrasing. Examples of recommended edits:

RESPONSE: We have re-read the paper more times and made several changes to the grammar. We have also made the changes suggested below (with the exception of Table 5 in which we believe our formatting is consistent with the journal’s recommendation). All changes are highlighted throughout the paper using track-edit changes.

P.3, line 58: "..communities, although there is.."
P.3, line 60: " exposures to many social stressors.."
P.6, line 131 "..reported having completed.."
P.6, line 132: "..reported living with.."
P.6, line 144: "Participants reporting working in.."
P.6, line 146: "..working much longer.."
P.7, line 165: "..reporting involvement in.."
P.8, line 194: "..reported being struck.."

Table 5: The sentence under the title should be moved to footnotes.

P.12, lines 235-6: ..option for improving the health.."

P.14, line 278: "Although of..

P. 14, line 283: "..everyone potentially exposed.."

P. 15, line 301: "..reported using.."

P. 15, line 313: "..would recall past events.."

P. 15, `line 319: "conclusion. First and foremost..".

If improvements to the English language within your manuscript have been requested, you should have your manuscript reviewed by someone who is fluent in English. If you would like professional help in revising this manuscript, you can use any reputable English language editing service. We can recommend our affiliates Nature Research Editing Service (http://bit.ly/NRES_BS) and American Journal Experts (http://bit.ly/AJE_BS) for help with English usage. Please note that use of an editing service is neither a requirement nor a guarantee of publication. Free assistance is available from our English language tutorial (https://www.springer.com/gb/authors-editors/authorandreviewertutorials/writinginenglish) and our Writing resources (http://www.biomedcentral.com/getpublished/writing-resources). These cover common mistakes that occur when writing in English.

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