**Reviews Round 1: The role of alcohol in the link between national football tournaments (soccer) and domestic abuse - evidence from England**

**Note the tight turnaround deadline of August 20th.**  
  
Reviewer #1: This study uses nearly a decade of police data to determine whether the prevalence of alcohol-involved domestic abuse is associated with football (soccer) matches, specifically whether England wins or loses. The authors find that there is a notable increase in the number of alcohol-involved domestic abuse on days when England wins football matches, and conduct several sensitivity analyses to check the robustness of their results. There is much to like about this article. I focus here on the potential limitations and suggestions to possibly improve it for publication.  
  
Introduction  
1. The authors may wish to consider the role of drinking patterns and intoxication in football and the prevalence and severity of domestic violence, especially considering that the hypothesized mechanism for why the game outcome would be associated with alcohol-involved domestic assault is related to drinking patterns.

We thank the reviewer for raising this point. Unfortunately, there is a real lack of evidence-based research focusing on the specific issue of alcohol, football, match outcome, and domestic abuse. While strong associations have been observed (including the present study), how exactly England wins result in an increase of alcohol-related domestic abuse remains poorly understood. We included a paragraph to highlight this gap in the literature.

*“Despite the strong link between England victories and domestic abuse, the exact pathway through which England wins result in an increase in alcohol-related domestic abuse remains unclear. Anecdotal evidence implies a spike in the number of alcohol poisoning cases following an England victory (Davies, 2018), suggesting that in the case of England, victories of the national football team result in elevated levels of alcohol consumption. Future research could focus on exploring the mechanism through which post-victory intoxication amongst England football fans translate into increased levels of violence (domestic or not).”*  
  
Methods  
2. If it is a reasonable number of codes, please list the crime codes included in the category of "domestic abuse." If these span more and less serious crimes, that may be important for readers to know.

We have now listed the offence class of the domestic abuse cases in the sample, see Table S1 in the Appendix.

3. Did the authors consider other potential confounders that would influence levels of alcohol consumption at football matches? For example, opponent rankings, temperature, and time of day have been shown to be important in some analyses of sports and intoxication or alcohol-related harms. Similarly, the authors include holidays (i.e., Christmas and New Year's Eve), did they consider adding major drinking holidays? If so, please briefly explain your model building process and/or why these confounders weren't retained.

We did consider including additional controls, particularly to investigate the effect of surprise results, time of day, and weather. However, given the low number of overall cases (22 England matches overall, and only 8 wins), this was unfortunately not possible. In England, Christmas and New Year’s Eve are the most important drinking holidays, and we indeed see a substantial increase in the number of reported alcohol-related domestic abuse cases on both of these holidays, therefore the inclusion of these controls resulted in a significantly improved overall model fit.   
  
4. Did the authors test for temporal clustering within the crime data to determine whether it was necessary to nest the observations within months and/or years?

To account for the strong temporal variation in the daily number of reported domestic abuse cases, each regression included day of week, month, year, Christmas, and New Year’s Eve controls.   
  
5. Why did the authors choose to not use an offset (i.e., calculate a rate) or adjust for annual population?

Population estimates for the West Midlands are only available on an annual level. As all our models include year as a control variable, the effect of population size and change will be reflected by this variable.  
  
6. A multiple testing correction is needed.

We thank the reviewer for raising this point. We updated the regression tables to make it clear which coefficients survive the multiple testing correction.  
  
7. The authors make several statements toward establishing causality. One way to buttress these statements would be to adjust their regression coefficient for under-reporting if there are data to suggest the proportion of domestic assaults that are reported in England using quantitative bias analysis.

Unfortunately, there is very little data on the extent of under-reporting of domestic abuse in the UK. The best source of information is an annual survey called Crime Survey for England and Wales (CSEW), which contains a self-completion module on domestic abuse. According to the CSEW, only 17% of victims who experienced domestic abuse in the year ending March, 2018 have reported it to the police. Assuming that England football matches do not affect reporting behaviour (our analysis or newly reported cases suggest this is the case), our estimate of the increase in alcohol-related cases on England football days should be an accurate reflection of the increase in the true number of cases.  
  
Results  
8. There are methods described in the results section; these should appear in the methods section.  
  
9. There are results for analyses and outcomes that are not described anywhere. Please describe these in the methods section.

We thank the reviewer for pointing this out. We have now updated the manuscript to mention and define all outcome variables in the Data section. All regression model types (negative binomial, Poisson, and logistic regression) are described in the Methods section in detail, and for each regression table, we make explicit mention of the type of model used. In addition, we have removed all methodological or other information from the results section, and moved it into either the Data or the Discussion section.

**Is it ok that I didn’t put these in the Methods section? E.g., I describe the rugby data in the data section as opposed to methods? I didn’t update the methods section, because it already details all three types of models. Also, all regression tables explicitly say which type of model we used so I am a bit confused which analyses I didn’t mention. Maybe by “analyses” he means regressions with different outcome variables? Good point about outcomes described in the results section, I shuffled things around so hopefully it reads better now.**

Discussion  
10. For the authors consideration: It may help readers grasp the significance of the findings to multiply your rate (0.53 per 100,000) by the population of WMP (2.9 million) to generate an approximate count of additional alcohol-involved domestic assaults?

We chose to report our results by 100,000 people to facilitate the generalisation of our estimates to other areas of England.   
  
11. The authors may also want to mention that it is a limitation that alcohol-involvement was subjective; there may be cases where alcohol was reported where it was not involved and vice versa, although the authors tried to mitigate this by incorporating data from the incidents.

We thank the reviewer for raising this point. We now explicitly list this as one of the limitations of the study.

12. Do the authors have a set of focused recommendations for how to reduce the odds of alcohol-involved domestic assault after football matches?

**No. No we do not. My opinion is that it’s fine to say that. We are empirical data scientists. We are applying our expertise to analysing the data on the problem, but believe that there are others with more appropriate expertise when it comes to developing policy or even treatments to change harmful behaviours.**

**Or, it might be that one of the references that reviewer 2 wants us to add will already have some recommendations, and we can just cite that.**

Overall, nice work!

**Thank you. Overall, nice review!**

Reviewer #2: General comment:  
An interesting study, revealing that the experience of a national success in an international football tournament substantially increases the likelihood of alcohol-related violent behaviors manifesting in domestic (and other) settings.  
  
Originality:  
The study is original in the sense that it, to the best of my knowledge and in line with the authors' claim, for the first time explores the role alcohol plays in the link between football and domestic abuse in a large-scale quantitative research design.  
  
International relevance:  
The study is relevant since football is the most popular sport in the world and alcohol consumption and related problem is high in connection to games and tournaments. These problems are a public health concern and results in negative consequences both for the society as a whole, as well as for the individual and brings harms to others.  
  
Significance of contribution:  
The study makes an interesting contribution to the research field by showing a connection between football games, game outcome, and alcohol-related violence, specifically domestic abuse.  
  
Is the manuscript likely to stimulate wider debate if published?  
The manuscript is likely to stimulate a wider debate since football is the largest sport in the world with high levels of alcohol consumption and related problems. This has been a problem for decades and as a matter of fact during the last European championship in France 2016 sales of alcohol were banned as a consequence of a number of alcohol-related violent incidents. That football events also have consequences for alcohol-related domestic violence is also a matter that I believe should be interesting both for the research community as well as the public. A wide debate, however, probably depends on active work with the third mission.

**Embarrassingly, I had never heard of the third mission. Essentially – impact and outreach. We should fully agree with them here. Say that we are working closely with the police to feed results in to policy development, and have already been in contact with organisations and press. (Nudge the journal into thinking this could be some good publicity for them.)**  
  
Coverage of appropriate existing literature;  
I note that there are 26 references, whereof 11 are not research papers. Since there is a body of research reporting on sporting events, alcohol consumption, and related problems (such as violence), there should be room to add more references. This would also help the paper in the sense of putting it into a larger context. For instance, there are papers reported that have demonstrated high levels of alcohol consumption at both football events (e.g., Durbeej et al. PlosOne, 2017) and other sporting events (e.g., Erickson et al. ACER, 2011; Glassman et al. J Alc Drug Edu, 2011). The paper would benefit from incorporating references to high levels of alcohol consumption at sporting events, in particular football.

**We should find a way to include these. It could also help address some of reviewer 1’s concerns. How tight are we on word count? Would we have to start thinking about moving some results to the appendix?**

In addition, I'm missing a discussion with regard to the implications of the study findings, specifically the implications to policy and prevention. There are a number of studies being conducted around the world attempting to reduce alcohol consumption and related problems at sporting events. The paper would benefit from referencing some of these studies, e.g., Kingsland et al. Syst Rev, 2016; Durbeej et al. BMC Publ Health, 2016; Elgán et al, ACER, 2018. That being said, the paper would benefit from highlighting where alcohol is consumed, i.e., in the home setting, pubs and bars, and the sport arena setting, and these are all potential settings for prevention that in the end should decrease different types of alcohol-related violence, including domestic violence.

**Cite these in the paper, and mention that the location is important. However, state here that we can’t go into detail about it because we don’t have the data. Even if we know an incident was within a domestic home, we don’t know if the drinking occurred there, or if they came home from the pub.**  
  
(if applicable) adequacy of methodology, analysis and interpretation:  
The chosen statistical methods used in the current study seems appropriate given the research question and data.

**Thank you. We have taken extreme care on this.**

The causal chain of events proposed by the authors is that the game outcome predicts the level of alcohol consumption, which in turn affects violence. However, this study, for obvious reasons, has no information about the level of alcohol consumption or intoxication levels, which then is a limitation.

**Yes, we agree this is sadly a limitation of the available data. We have made sure to note and discuss this in the paper, noting however that the conclusions are supported by the random allocation of matches to days, and that the increase in domestic abuse is unique to alcohol related incidents.**

I think that it is interesting that the obtained results stand in contrast to those obtained in the American study were loss of the local National Football League (NFL) team resulted in a 10% increase in the rate of reported male to female intimate partner violence. A somewhat elaborated discussion of this circumstance would make an interesting contribution in the discussion section.

We now explicitly mention this contrast in the discussion**. Need to improve this discussion**

The significance levels are reported as thresholds, however, I think it would be more valuable to the reader if exact p-values are reported.

We have now updated the regression tables and report the exact p-values.  
  
Clear, concise and jargon-free writing style:  
The manuscript should benefit from a more clear structure, see below.  
  
Structure and organization:  
In what way are the results from this study relevant from a social or public health perspective?  
The hypothesis of the study could be more clearly expressed in the introduction. On page 3 it says: "To test our hypothesis…", however, the hypothesis has not been clearly presented/expressed in the previous text.

We thank the reviewer for pointing this out. We now have updated the introduction to make our hypothesis clearer.

*“Despite the evident links between alcohol and domestic abuse, the role alcohol plays in the link between football and domestic abuse has not yet been explored in a large-scale quantitative study. Given the strong association between drinking culture and football in England (Dixon, 2014), a relationship continuously reinforced by the marketing practices of the alcohol industry (Gornall, 2014), we conjecture that alcohol acts as an aggravating factor in the link between football and domestic abuse in England.*

*Specifically, we hypothesize that when the England national football team plays, the number of reported alcohol-related domestic abuse cases increases. Based on previous research focusing on the link between the football World Cup and domestic abuse in England (e.g., Brimicombe & Cafe, 2012; Kirby et al., 2014), we expect the effect to be stronger on England loss and win days. Exploring the link between football, alcohol, and domestic abuse will deepen our understanding of the pathway through which football (and more specifically the outcome of the match) increases propensity for violence in domestic settings.”*

The result section presents a mix of method descriptions, normative phrases, and discussion of the results, such as (p. 11): "less surprising", "probably" etc., and references to previous research: "more consistent with previous findings…", which creates confusion for the reader. And (p.14): "If we only observe an increase…", which might belong to the discussion section. Thus, the authors could consider to be more concise as to what belongs in the results section and the discussion section, respectively.

We thank the reviewer for pointing this out. We have now updated manuscript, and made the results section more focused and moved all normative discussions to the discussion section.

Please elaborate more on the limitations. For instance, the actual intoxication level is not known as well as if the game took place on a weekday as opposed to a weekend, and during the day or evening. For instance if a game take place during a week day during the day, one could hypothesize that people are drinking less which would lead to less domestic violence.

We now explicitly address the limitations of not knowing the actual intoxication level. All our analyses take day of week into account, and we now added time of day to the list of factors we list as potential important modulators of the link between football matches and domestic abuse.