The link between national football tournaments and alcohol-related domestic abuse - evidence from England

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January 23, 2020

Introduction

Domestic abuse is increasingly recognised as a major public policy concern in many countries, including the UK (?, ?). While anyone can become a victim of domestic abuse, women are disproportionately affected, with more than 25% of women, and 15% of men in England and Wales reported to have experienced some form of domestic abuse since the age of 16 (Office for National Statistics, 2018).

The link between sporting events and domestic abuse has been the focus of a number of smaller studies (Williams & Neville, 2014), but large-scale quantitative investigations of this relationship are relatively scarce. In England, previous studies have focused on the link between football (soccer) and domestic abuse. Football's history is inextricably linked to England, and it is by far the most popular sport in the country (Parry, Jones, & Wann, 2014), with the 2018 World Cup attracting a record number of 44.5 million viewers (*World Cup 2018: Record-breaking online & viewing figures for BBC*, 2018). These studies have found significant increases in the number of domestic abuse cases recorded by the police on England win, and particularly on England loss days (Brimicombe & Cafe, 2012; Kirby, Francis, & O'Flaherty, 2014). While domestic abuse is predominantly understood as a pattern of ongoing behaviour involving a series of occurrences, rather than a one-off incident triggered by football (Brooks-Hay & Lombard, 2018), these studies, and other qualitative investigations (Swallow, 2017) nevertheless suggest that national football tournaments can create an environment where domestic abuse is more likely to occur.

Why would national football tournaments, such as the World Cup or the European Championship precipitate domestic abuse? England's participation in these tournaments are times of heightened patriotic emotions and a strengthened sense of "Englishness", fuelled by media narratives that often use war references, and a "us vs. them" rhetoric to generate and represent an English national identity (Vincent & Harris, 2014). Previous qualitative research has suggested that televised contact sports can serve as vehicle for the male sports fan to redefine, and express his masculinity in a way that allows dominance, control, and can ultimately manifest in the perpetration of domestic abuse (Sabo, Gray, & Moore, 2000; Swallow, 2017), given

susceptibility to such behaviours. We speculate that this observation is especially pertinent in the context of England's participation in national football tournaments, owing to the popularity of the sport in the country, the associated media attention, and the resulting heightened sense of national consciousness.

Previous studies found a strong link between alcohol and domestic abuse, suggesting that alcohol can either be seen as a contributing cause, an aggravating factor, or a trigger of violent behaviour in domestic (and other) settings (Leonard & Quigley, 2017). The ecological model of intimate partner violence (IPV; the most common form of domestic abuse) sees IPV as a product of societal, community, relationship, and individual influences. From a community perspective, (Graham, Wilson, & Taft, 2017) argue that social contexts where excessive drinking is encouraged (e.g., through the promotion of alcohol during sporting events) are often permissive of violent behaviour and sexism, which can increase the likelihood of alcohol-related domestic abuse. However, strong inhibitory factors (e.g., social norms, and more specifically the condemnation of peers) can offset the disinhibitory effect of alcohol consumption, and reduce the likelihood of subsequent perpetration.

Despite the well-documented connection between alcohol and domestic abuse, the role alcohol plays in the link between football and domestic abuse has not yet been explored. 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 plays an important role in the link between national football tournaments and the well-documented increase in domestic abuse. Exploring the role alcohol plays in this relationship will deepen our understanding of the pathway through which football increases propensity for violence in domestic settings.

To investigate this question, this study explores whether the daily number of reported alcohol and non-alcohol related domestic abuse cases recorded by the third largest police force in England (West Midlands Police; WMP) between 2010 and 2019 increase on days when the England national team plays in a national football tournament (the FIFA World Cup and UEFA European Football Championship), and whether the effect, if any, depends on the result of the match.

In these tournaments, England match days are allocated randomly (as the fixtures are determined through a random draw), which make these events the perfect instruments for testing the effect of England matches on domestic abuse. Our rich dataset covering a decade worth of crime data further allows us to conduct a thorough investigation of the characteristics and temporal pattern of the domestic abuse perpetrated on England match days, and extend our findings in different directions. We also test the robustness of the effect using various model specifications, time periods, and geographical areas.

Methods

West Midlands Crime Dataset

Our dataset comprises all incidents and crimes recorded by the West Midlands Police (WMP) in the period between January, 2010 and October, 2019. The WMP is the third largest police force in England (Home Office, 2018), serving an area with a population over 2.9 million in 2018 (Office for National Statistics, 2017).

The WMP records all reported cases in two databases: incidents and crimes. Most reported cases will be initially recorded as incidents (and then later might be also recorded as a crime after investigation), with a smaller fraction immediately recorded as crimes (if it is clear that it meets the criteria for notifiable offences, Home Office, 2019). For this reason, some recorded crimes will have matching incident entries, while others will not. As an exception, specific types of reported cases (e.g., rape, domestic abuse, child abuse) that, after investigated, do not qualify as a crime (e.g., due to lack of evidence), still get recorded in the crimes database with the indicator "non crime" (e.g., "domestic violence incident - non crime").

The incidents dataset contains markers capturing various key aspects of the reported case (e.g., domestic abuse, alcohol, drugs, mental health, etc.; Home Office, 2011) recorded in the call centre which are then used to assess the severity of case (and support the decision as to whether police attendance is required). In contrast, each case in the crimes dataset had been attended by the police, and therefore contains detailed information about the offence that took place, the gender, age, and ethnicity of the victim and offender, and the location and exact

time of the crime.

Given that much more information are recorded about crimes than incidents, we decided to restrict our analysis to entries in the crimes dataset (cases that have been investigated by the police), and use only matching entries from the incidents dataset (if any), which provide additional useful call centre-recorded markers about the nature of each crime. This allows us to identify if a recorded serious crime (e.g., grievous bodily harm) was domestic abuse-related. However, our core results stay the same if we only use information contained in the crimes dataset or include both all crimes and incidents in the analysis.

We coded each reported case as domestic abuse-related if (1) in the crime dataset the offence description explicitly stated so (either "domestic violence incident" or "coercive/controlling behaviour in a domestic setting") or (2) one of the linked incident markers (if any) stated "domestic violence". This method ensured that we used all information available to us to identify domestic-abuse related cases. To determine whether a case was alcohol-related, we again collated information from various markers and created an alcohol flag if any of these markers contained "alcohol".

There were 427,351 reported cases of domestic abuse in this 10-year period, comprising 17% of all recorded crimes and incidents in the dataset. Of these cases, 26% were alcohol-related (in contrast, only 9% of non domestic abuse cases are alcohol-related). In the period between 2010 and 2018, the daily rate of non-alcohol related domestic incidents falls between 1.42–3.95 cases per 100,000 individuals, whereas the daily rate of alcohol-related cases falls between 0.84–1.67 cases per 100,000 individuals (the overall rate falls between 2.4 and 5.01 per 100,000 individuals).

Figure 1 shows the daily average number of alcohol and non-alcohol related domestic abuse cases reported to WMP by day of the week. The reported number of domestic abuse cases, and particularly alcohol-related cases show strong variation throughout the week, with generally fewer reported cases mid-week, and a pronounced increase over the weekend.

In the UK, the term "domestic abuse" refers to a wide range of behavioural patterns, from physical and sexual violence to psychological, emotional, financial abuse, threatening behaviour, stalking and harassment, either within a family or an intimate relationship (Office

Figure 1
The daily average number of alcohol and non-alcohol related domestic abuse cases reported to the police, by day of the week. The error bars show bootstrapped 95% confidence intervals, stratified by month.
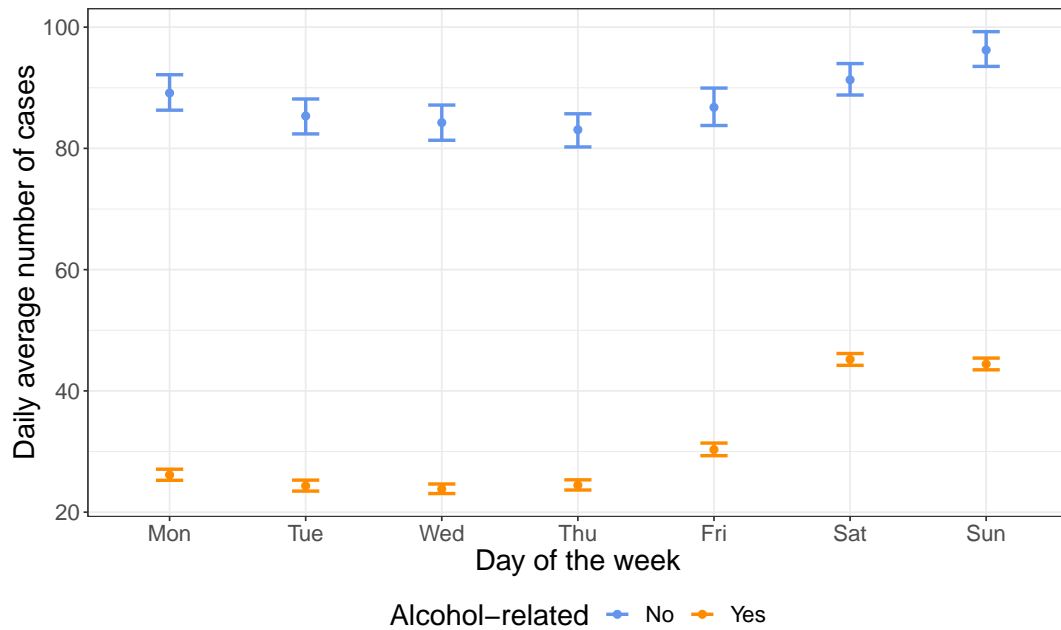
for National Statistics, 2018). Previous research has mostly focused on IPV, the largest sub-category of domestic abuse. While IPV is more common than abuse perpetrated by family members (Office for National Statistics, 2018), our dataset does not contain information about the exact relationship between the victim and perpetrator, therefore we cannot separate the two types of abuse, and we will refer to them collectively as "domestic abuse".

Our dataset contains all cases of domestic abuse that have been reported to the WMP between 2010 and 2019, but the vast majority of domestic abuse incidents in fact never get reported (according to the Crime Survey of England and Wales, only 17% of domestic abuse victims reported the abuse to the police between April 2017 and March 2018; Office for National Statistics, 2018). This substantial reporting bias, and its potential correlation with other contextual factors warrants a careful interpretation of the estimates from any quantitative study investigating domestic abuse, and highlights the importance of utilising a mixed methods approach to explore the factors contributing to the prevalence of domestic abuse.

There were three World Cups (2010, 2014, 2018) and two European Championships (2012, 2016) in the period covered by our dataset. All of these tournaments took place in the months

of June and July. Table 1 shows the matches of the English national football team in these tournaments. Out of 22 matches overall, England won and lost both eight times, while six matches ended in a draw.

Table 1
Matches played by the English national football team in the World Cup and European Championship tournaments between 2010 and 2019.

Date	Other Team	Tournament	Year	Result
2010-06-12	USA	World Cup	2010	England draw
2010-06-18	Algeria	World Cup	2010	England draw
2010-06-23	Slovenia	World Cup	2010	England win
2010-06-27	Germany	World Cup	2010	England lost
2012-06-11	France	European Championship	2012	England draw
2012-06-15	Sweden	European Championship	2012	England win
2012-06-19	Ukraine	European Championship	2012	England win
2012-06-24	Italy	European Championship	2012	England lost
2014-06-14	Italy	World Cup	2014	England lost
2014-06-19	Uruguay	World Cup	2014	England lost
2014-06-24	Costa Rica	World Cup	2014	England draw
2016-06-11	Russia	European Championship	2016	England draw
2016-06-16	Wales	European Championship	2016	England win
2016-06-20	Slovakia	European Championship	2016	England draw
2016-06-27	Iceland	European Championship	2016	England lost
2018-06-18	Tunisia	World Cup	2018	England win
2018-06-24	Panama	World Cup	2018	England win
2018-06-28	Belgium	World Cup	2018	England lost
2018-07-03	Colombia	World Cup	2018	England win
2018-07-07	Sweden	World Cup	2018	England win
2018-07-11	Croatia	World Cup	2018	England lost
2018-07-14	Belgium	World Cup	2018	England lost

Data analysis

In the following regressions, each observation represents the overall number of reported domestic abuse cases that have been perpetrated on a given day in the period between 2010 and 2019. Since our outcome variable is a count, we considered using a Poisson or a negative binomial regression model framework. Formally, if C_i is the number of reported cases on days $i = 1...N$, then these models can be formally expressed as

$$\ln(\lambda_i) = x_i^T \beta$$

where $C_i \sim Pois(\lambda_i)$ or $C_i \sim NegativeBinomial(\lambda_i\theta)$

In the Poisson framework, it is assumed that the mean of the distribution (λ_i) is equal to the variance. However, for certain types of count data, the observed variance can exceed the mean, causing overdispersion. If overdispersion is present in the data, the Poisson model understate the standard error of the estimates, leading to erroneous conclusions. Given the complex nature of domestic abuse, it is likely that our model will not able to fully account for all the factors influencing the number of reported cases on a given day, leading to unobserved heterogeneity and increasing the likelihood of overdispersion if using a Poisson model. Testing for overdispersion in a Poisson model involves testing the null-hypothesis of equidispersion (the mean being equal to the variance).

If there is evidence for overdispersion, a negative binomial model is a more suitable modelling framework, as it includes an additional parameter θ to allow the variance to deviate from the mean. In the following analyses, our choice of regression framework in all cases is informed by a test of overdispersion. All analyses were performed in R (version 3.4.0). negative binomial regressions, each observation is a day in the period between 2010 and 2018, and our main outcome variable is the number of alcohol and non-alcohol related domestic abuse cases reported to have been perpetrated on that day. To investigate how national football tournaments affect our outcome variables, we classify each day in our dataset as either a day on which England won (England win), lost (England lost) or drew (England draw), a day after an England match day (After England), any other day during the months of the tournament (Tournament on), or any other day during the rest of the year (Non-tournament day). All regressions include year, month, day of the week, Christmas and New Year's Eve controls.

We first explore the effect of football on alcohol-related domestic abuse under various model specifications, followed by a three-hour analysis of the effect. We then investigate if the effect varies by perpetrator-victim gender subgroup, and whether it extends to rugby, the second most popular sport in England. We then investigate if similar effects can be observed for other offence types, apart from domestic abuse. Finally, as a robustness check, we contrast our results with findings from a re-analysis of data from a previous study on domestic abuse and football.

Results

We first compare various, increasingly complex model specifications to understand the relationship between football, alcohol and domestic abuse. As shown in Table 2, adding type of day as an explanatory variable to a model with only alcohol and time controls marginally improves the model fit (see column 2), and the results show a 20%, 95% CI [5%–38%] increase in the number of reported domestic abuse cases when the England national football team wins. The comparison between column 2 and 3 reveals that this increase stems from a much more pronounced 61% 95% CI [24%–110%] increase within the subgroup of alcohol-related domestic abuse cases on days when England wins. We find no evidence for comparable increases in the number of reported domestic abuse cases when the England national team loses. Less surprising, and more consistent with previous findings is the lack of an increase on England draw days, probably due to the fact that high-stake matches after the group-stage in the tournament cannot result in a draw.

Further interacting alcohol with the rest of the time-specific control variables results in a substantially improved model fit (see column 4), but does not alter the effect of an England win on alcohol-related domestic abuse (61%, 95% CI [32%–96%]). The results also reveal a smaller, 9%, 95% CI [1%–17%] increase in non-alcohol related cases on days following an England match day, potentially the result of a temporal spillover effect from the previous match day. We also see an 8%, 95% CI [2%–14%] decrease in alcohol-related cases during the tournament, but not on England match days, perhaps stemming from heavy drinking being mostly concentrated around England match (and particularly England win) days, and relatively lower alcohol consumption on other days during the tournament.

Next, we explore the temporal dynamics of the increase in alcohol-related domestic abuse on England match days in more detail. To analyse the temporal dynamics of the England win effect (see Figure 2), we divided each day in our dataset into eight three-hour periods, the first one starting at 12am, and used these to identify specific time windows around the time of the match. The exact time of the matches vary considerably (the earliest starting at 1pm, and the latest at 11pm). We first identified the three-hour period of the day into which each

Table 2
Number of reported domestic abuse incidents by alcohol involvement and type of day

|	Dependent variable:			
	Number of reported domestic abuse cases per day			
	(1)	(2)	(3)	(4)
Alcohol	−0.719***	−0.719***	−0.719***	−0.862***
	(0.007)	(0.007)	(0.008)	(0.031)
Tournament on		−0.004	0.014	0.032
		(0.023)	(0.027)	(0.020)
England win		0.205***	−0.037	−0.031
		(0.069)	(0.091)	(0.063)
England draw		0.025	0.048	0.047
		(0.082)	(0.104)	(0.072)
England loss		0.078	−0.013	0.050
		(0.068)	(0.089)	(0.061)
After England		0.097**	0.075	0.086**
		(0.043)	(0.055)	(0.038)
Tournament on:Alcohol			−0.043	−0.083**
			(0.040)	(0.035)
England win:Alcohol			0.610***	0.606***
			(0.135)	(0.101)
England draw:Alcohol			−0.055	−0.034
			(0.165)	(0.129)
England loss:Alcohol			0.223	0.076
			(0.135)	(0.101)
After England:Alcohol			0.051	0.037
			(0.084)	(0.066)
Number of days	3,017	3,017	3,017	3,017
AIC	45,539.500	45,536.770	45,530.360	41,959.280

[a] *$p<0.1$; **$p<0.05$; ***$p<0.01$
[b] *Estimates are exponentiated coefficients from a series of negative binomial regressions (based on tests of overdispersion) with year, month, day of week, Christmas, New Year's eve controls; Model 4 further includes interactions between alcohol and all control variables; standard errors in parentheses*

match falls. If the start and end time of the match did not fall in the same three-hour period, we chose the three-hour period that covers the larger part of the match (e.g., a 2.5 hour long match starting at 7pm will be assigned to the 6-9pm period and not to the 9pm-12am period). Our previous results revealed important differences in the effect of football on alcohol and non-alcohol cases, therefore we run two separate regressions for alcohol and non-alcohol related domestic abuse cases to analyse the temporal pattern of the increase. Figure 2 shows a plot of the estimated percentage increase from these negative binomial regressions, revealing a stark increase in alcohol-related domestic abuse on days of an England victory, starting in the three hour period of the match, peaking in the three-hour period afterwards, and gradually

Figure 2

The temporal dynamics of the football-induced increase in domestic abuse, by alcohol involvement
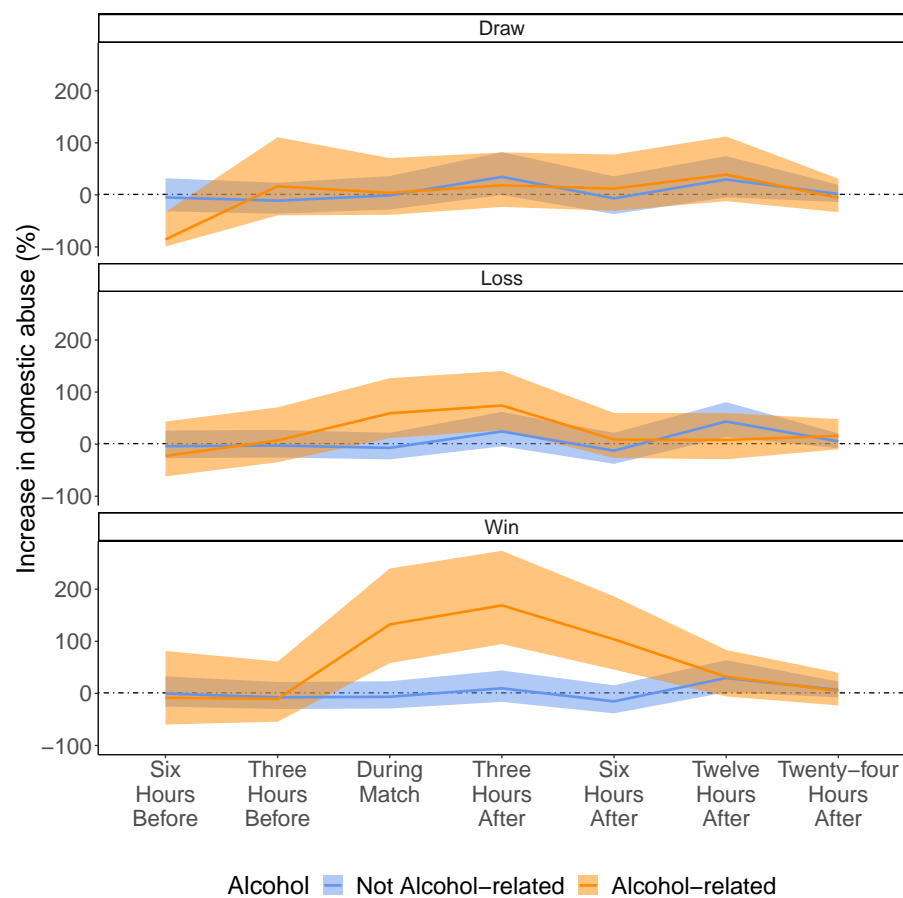
Note: Estimates are from two separate negative binomial regressions (based on tests of overdispersion) with year, month, day of week, three-hour period of day, Christmas, New Year's eve controls. Shaded area is 95% CIs.

declining to its original level in the twenty-four hours following the victory. Interestingly, we also see a slight increase in non-alcohol related incidents twelve hours after a loss or a victory, probably reflecting the small increase in non-alcohol related domestic abuse after an England match day seen in Table 2.

Given the evidence for the gendered nature of domestic abuse, we find it instructive to test whether the effect varies by perpetrator-victim gender subgroup. The first four columns of Table 3 show the results from four negative binomial regressions, one for each offender-victim gender groups. These reveal a pronounced increase in the subgroup of Male to Female abuse (which comprises about 80% of all domestic abuse cases in our data), where the number of reported alcohol-related cases increase by 67%, 95% CI [35%–107%] on England win days.

Table 3
The effect of football by perpetrator-victim subgroups and offence types, and the effect of rugby.

	Dependent variable:								
	Reported number of domestic abuse cases								
	Male to Male	Male to Female	Female to Female	Female to Male	Six Nations (Rugby)	Property-related Offences	Public Order Offences	Hate incidents	Other violent Offences
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Alcohol	−0.825***	−0.870***	−0.858***	−0.808***	−0.862***	−0.981***	−0.922***	−0.934***	−0.902***
	(0.101)	(0.034)	(0.080)	(0.080)	(0.031)	(0.065)	(0.080)	(0.115)	(0.040)
Tournament on	0.005	0.038*	−0.048	0.053	0.005	0.042	0.096**	0.138***	0.034
	(0.054)	(0.021)	(0.045)	(0.045)	(0.019)	(0.026)	(0.036)	(0.047)	(0.027)
England win	−0.068	−0.022	−0.147	0.019	0.0001	0.052	0.234**	0.073	0.094
	(0.165)	(0.066)	(0.135)	(0.135)	(0.035)	(0.074)	(0.095)	(0.136)	(0.077)
England draw	0.080	0.038	0.107	0.043		0.100	−0.065	−0.066	0.035
	(0.194)	(0.076)	(0.169)	(0.169)		(0.085)	(0.128)	(0.168)	(0.092)
England lost	−0.063	0.065	0.117	−0.036	0.056	−0.042	0.075	0.011	0.089
	(0.162)	(0.064)	(0.136)	(0.136)	(0.055)	(0.078)	(0.100)	(0.139)	(0.078)
After England	−0.036	0.093**	0.025	0.152*	−0.010	0.052	0.161**	0.141	0.108**
	(0.103)	(0.040)	(0.082)	(0.082)	(0.031)	(0.047)	(0.062)	(0.084)	(0.048)
Alcohol:Tournament on	−0.181*	−0.077**	−0.215*	−0.018	−0.047	0.135	−0.197**	−0.215*	−0.009
	(0.106)	(0.038)	(0.084)	(0.084)	(0.035)	(0.080)	(0.101)	(0.141)	(0.051)
Alcohol:England win	0.334	0.674***	0.472	0.360	0.045	0.259	0.020	0.310	0.507***
	(0.285)	(0.108)	(0.231)	(0.231)	(0.059)	(0.219)	(0.256)	(0.359)	(0.132)
Alcohol:England draw	−0.282	0.031	−0.580	0.071		0.060	0.374	0.393	0.360*
	(0.411)	(0.138)	(0.313)	(0.313)		(0.264)	(0.303)	(0.431)	(0.161)
Alcohol:England lost	0.286	0.028	−0.088	0.328	−0.073	0.144	0.456*	−0.032	0.018
	(0.279)	(0.111)	(0.231)	(0.231)	(0.091)	(0.226)	(0.228)	(0.393)	(0.138)
Alcohol:After England	0.209	0.052	−0.040	−0.111	−0.021	0.094	0.127	0.446*	0.053
	(0.185)	(0.071)	(0.159)	(0.159)	(0.055)	(0.144)	(0.158)	(0.211)	(0.088)
Number of days	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017

Note: $p<0.1$; **$p<0.05$; ***$p<0.01$

[a] *$p<0.1$; **$p<0.05$; ***$p<0.01$
[b] *Estimates are exponentiated coefficients from a series of negative binomial regressions (based on tests of overdispersion) with month, day of week, Christmas, New Year's eve controls interacted with alcohol; there was only one England rugby match that resulted in a draw between 2010 and 2018, therefore we excluded it from the data; standard errors in parentheses*

While we see similar tendencies for alcohol-related cases in other gender subgroups on England win days, these coefficients are about half the size of the male to female effect, and are not statistically different from zero.

Does this effect generalise to other sporting events, or is it specific to football? It has been previously suggested that other popular sports, such as rugby have similar links with domestic abuse (Brooks-Hay & Lombard, 2018). Rugby is the second most popular sport in England after football (*Rugby Union 'Britain's Second Most Popular Sport'*, 2003). Focusing on the Six Nations, a high-profile rugby tournament that takes place every year with the participation of England, Wales, Scotland, Ireland, France and Italy, we explored whether the reported number of domestic abuse cases increase on days when the England national rugby team plays. The results show no comparable effects for rugby matches (see column 5 in Table 3), potentially stemming from differences in timing, media coverage, audience numbers, and the involvement of alcohol between the two tournaments.

Our unique dataset further allows us to explore whether England games have similar effects on other types of criminal behaviours, apart from domestic abuse. Specifically, we are interested in how an England match day affects the number of reported property-related crimes (including burglary, theft and robbery), public order offences (behaviours that cause offence to the general public), hate crimes (hate incidents and any other racially or religiously aggravated crime), and other violent crimes (excluding cases of domestic abuse). Of particular interest is the effect of football on non-domestic violent crimes, since it is possible that alcohol-fuelled violence that follows an England victory is not limited to family and intimate partner relationships. The last four columns in Table 3 shows the results from a series of negative binomial regressions for different types of criminal behaviours. These reveal that while there is no evidence that England matches affect the number of reported property-related offences, we see an increase in the number of non-alcohol related public order offence cases on tournament days, when England wins, and on days after an England game. Hate incidents with no alcohol involvement also increase when the tournament is on. But most importantly, the effect of an England match on alcohol-related cases extends to other, non-domestic violent offences, resulting in a 55%, 95% [43%–72%] increase on days when England wins, and a

smaller increase on days following an England match, the exact same pattern we have seen for domestic abuse. Further analysis reveals that the increase in these alcohol-related non-domestic violent crimes also predominantly comes from male to female cases (although male to male and female to male cases also contribute, see Table S1 in the Supplemental Material). While it is possible that a number of misclassified domestic abuse cases are reflected in this result (e.g, if the victim chooses not to disclose any relationship to the offender), but even if this was the case, taken together, these findings suggest that football and alcohol primarily make men more violent, and direct this violence overwhelmingly towards women.

A previous study by (Kirby et al., 2014) have found that an England loss results in the most pronounced increase in domestic abuse (38%), and a win or draw have a slightly smaller effect (26%). They used daily counts of IPV in Lancashire from the months of the 2002, 2006, 2010 World Cups. Upon re-analysing their data by treating wins and draws as two separate variables (resulting in an improved model fit, see Table 4), we see a roughly similar effect for wins (45%, 95% CI [28%–64%]) and losses (39%, 95% CI [18%–64%]), and no effect when England draws. Our reanalysis replicates the win effect seen in the West Midlands data, though the absence of a loss effect remains a stark difference between the two studies.

To explore the underlying reason for this discrepancy and test the robustness of our results, we find it instructive to break our analysis into specific tournament years for the two datasets (see Table 5). An interesting common pattern in both datasets is the large effect of England's victory over Slovenia in the group stage of the 2010 World Cup, which, after much anticipation, secured their progression to the next stage of the tournament. Equally, the subsequent loss against Germany in the knockout stage resulted in a substantial increase in the number of reported domestic abuse incidents, which is the only tournament year in our dataset where a loss effect appears. This is in line with findings from an earlier examination by (Brimicombe & Cafe, 2012). As a further robustness check, we examine the sensitivity of the result to the exclusion of specific tournament years (see Table 6), which shows that while the size of the England win effect varies, it is robust to the exclusion of specific years, and is not driven by an unusually large effect in one of the tournament years.

Table 4
Replication of Kirby et al. (2014) with an alternative specification

	Dependent variable:	
	Number of reported IPV cases per day	
	Original Model	Win/Draw Separate
	(1)	(2)
England windraw	0.256***	
	(0.055)	
England win		0.452***
		(0.064)
England draw		0.032
		(0.073)
England loss	0.382***	0.388***
	(0.094)	(0.085)
After England	0.111**	0.113**
	(0.051)	(0.047)
Number of days	92	92
AIC	714.980	704.356

[a] *$p<0.1$; **$p<0.05$; ***$p<0.01$
[b] *Estimates are exponentiated coefficients from a series of negative binomial regressions (based on tests of overdispersion) with year and day of week controls; standard errors in parentheses; data is only available during the tournament period*

Table 5
Year subgroup regressions, Lancashire and West Midlands data

Dependent variable:

	Number of IPV cases per day in Lancashire			Number of domestic abuse cases per day in West Midlands				
	negative binomial		_Poisson_	_negative binomial_				
	2002	2006	2010	2010	2012	2014	2016	2018
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tournament on				0.074*	−0.066	−0.048	0.035	0.089*
				(0.041)	(0.085)	(0.044)	(0.041)	(0.044)
England win	0.596***	0.297***	0.916***	0.050	−0.237		−0.008	0.061
	(0.152)	(0.077)	(0.114)	(0.155)	(0.175)		(0.151)	(0.077)
England draw	0.100	0.098	−0.137	−0.029	0.324	−0.077	−0.021	
	(0.150)	(0.156)	(0.095)	(0.112)	(0.204)	(0.173)	(0.108)	
England loss	0.200	0.373***	0.568***	0.174	−0.127	−0.042	−0.155	0.066
	(0.232)	(0.117)	(0.106)	(0.140)	(0.212)	(0.124)	(0.154)	(0.088)
After England	0.253**	0.122*	0.024	0.070	−0.008	0.007	0.038	0.140**
	(0.101)	(0.070)	(0.065)	(0.082)	(0.125)	(0.103)	(0.081)	(0.060)
Tournament on:Alcohol				−0.093	0.076	0.063	−0.163**	−0.068
				(0.101)	(0.162)	(0.076)	(0.072)	(0.078)
England win:Alcohol				2.558***	0.756*		0.348	0.460***
				(0.277)	(0.314)		(0.257)	(0.123)
England draw:Alcohol				0.078	−0.581	0.089	0.129	
				(0.246)	(0.571)	(0.307)	(0.180)	
England loss:Alcohol				0.748**	0.301	0.048	−0.289	0.160
				(0.259)	(0.372)	(0.206)	(0.322)	(0.149)
After England:Alcohol				0.128	−0.072	0.068	−0.112	0.188*
				(0.183)	(0.254)	(0.171)	(0.144)	(0.102)
Number of days	30	32	30	730	732	730	732	618

[a] * _p<0.1; **p<0.05; ***p<0.01_
[b] _Estimates are exponentiated coefficients from a series of negative binomial or poisson regressions (based on tests of overdispersion). The first three regressions have day of week control, the rest of the regressions have month, day of week, Christmas, New Year's eve controls interacted with alcohol; standard errors in parentheses_

Table 6
Robustness of the result: sensitivity to the exclusion of specific years

	Dependent variable:				
	Number of domestic abuse cases per day				
	2018 excluded	2016 excluded	2014 excluded	2012 excluded	2010 excluded
	(1)	(2)	(3)	(4)	(5)
	(0.033)	(0.033)	(0.032)	(0.031)	(0.033)
Tournament on	0.018	0.015	0.027	0.030	−0.003
	(0.022)	(0.025)	(0.025)	(0.022)	(0.025)
England win	−0.093	−0.047	−0.029	0.019	−0.051
	(0.097)	(0.068)	(0.062)	(0.066)	(0.067)
England draw	0.038	0.077	0.057	0.004	0.046
	(0.072)	(0.091)	(0.078)	(0.075)	(0.088)
England loss	0.030	0.066	0.053	0.054	0.013
	(0.079)	(0.065)	(0.069)	(0.062)	(0.065)
After England	0.057	0.080*	0.088**	0.099**	0.071*
	(0.048)	(0.042)	(0.040)	(0.039)	(0.042)
Alcohol:Tournament on	−0.086**	−0.037	−0.118***	−0.092**	−0.048
	(0.039)	(0.046)	(0.047)	(0.040)	(0.042)
Alcohol:England win	0.884***	0.674***	0.609***	0.574***	0.511***
	(0.163)	(0.109)	(0.100)	(0.105)	(0.107)
Alcohol:England draw	−0.046	−0.141	−0.048	0.055	−0.017
	(0.130)	(0.179)	(0.141)	(0.131)	(0.151)
Alcohol:England loss	0.014	0.139	0.131	0.078	0.039
	(0.134)	(0.107)	(0.116)	(0.103)	(0.109)
Alcohol:After England	−0.065	0.096	0.050	0.054	0.050
	(0.086)	(0.073)	(0.071)	(0.067)	(0.071)
Number of days	2,708	2,651	2,652	2,651	2,652

[a] *p<0.1; **p<0.05; ***p<0.01
[b] *Estimates are exponentiated coefficients from a series of negative binomial regressions (based on tests of overdispersion) with year, month, day of week, Christmas, New Year's eve controls interacted by alcohol; standard errors in parentheses*

Discussion

We have shown that an England victory in a national football tournament is followed by a 61% increase in the reported number of alcohol-related domestic abuse cases, and that the temporal pattern of the increase suggests a causal mechanism. The effect is entirely limited to alcohol-related abuse, even though alcohol-related domestic abuse cases comprise only 23% of all domestic abuse in our dataset. As such, we see this as strong quantitative evidence that alcohol plays an instrumental role in the relationship between football and domestic abuse. This effect is exclusively limited to male-perpetrated domestic abuse, implicating a victory-induced violent expression of masculinity coupled with alcohol consumption as the pathway by which football increases abuse. In line with this, anecdotal evidence suggests that alcohol consumption increases following an England victory (Davies, 2018).

It had been previously suggested that the apparent link between football and domestic abuse can be explained by other factors, including high-profile events taking place around the time of the match, increased policing on England match days, and the effect of awareness campaigns before the tournaments (Brooks-Hay & Lombard, 2018). However, our three-hour analysis strongly suggests that the effect is causal, further supported by the fact that the majority of England match days were allocated randomly. In addition, we could expect that higher levels of policing on England match days would result in an increased number of recorded cases perpetrated outside, and that a successful pre-tournament awareness campaign would result in an increase in the number of newly reported cases. Our results presented in Table S2 in the Supplemental Material do not support either of these alternative hypotheses in that we do not see more newly reported, or publicly perpetrated cases of abuse on England win days. Furthermore, it is unclear why the effect of other events, different policing practices, or awareness campaigns would depend on the result of the match.

One limitation of our analysis is that it only relies on cases recorded by the police, while the vast majority of domestic abuse cases do not get reported. Future investigations of the link between football, alcohol, and domestic abuse should aim to combine data from various sources (e.g., police data, calls to shelters, hospital admissions, etc.) to address the potential bias aris-

ing from underreporting.

Our study represent the most extensive quantitative investigation of the link between football and domestic abuse up to date. We have shown that our findings are largely in line with results from previous, smaller-scale investigations from England (the main difference being the lack of an England loss effect in our sample), and substantially extend them in highlighting the instrumental role alcohol plays in the relationship between football and domestic abuse. While the effect of a victory or loss is likely to be highly specific to the context of a particular match (e.g., group stage or knockout stage, previous performance of the team, weather on the day, etc.), the estimated effect of an England victory on the number of reported domestic abuse cases is robust to different model specifications, using data from a different geographical area, and the exclusion of specific tournament years.

Based on the pre-match betting odds, all of the England victories were expected in our dataset. This suggests that in the context of England's participation in national football tournaments, it is living up to the expectations of the fans that results in largest emotional effect and affects levels of alcohol consumption. Indeed, English newspapers' narratives about the team's performance in these tournaments are characterised with high levels of optimism, expectation and yearning for the glory of the 1966 World Cup (Vincent, Kian, Pedersen, Kuntz, & Hill, 2010). Previous research has demonstrated how the vicarious experience of watching their team play can increase supporter's testosterone and cortisol levels, even when they expect their team to win, suggested to be an adaptive response to the perceived threat to one's social identity (van der Meij et al., 2012).

For victims, domestic abuse does not occur once every four years following a football match, but is a lived experience of constant fear (Brooks-Hay & Lombard, 2018). Nevertheless, our results provide a deeper understanding of the contexts that can be conducive to abuse. In particular, these findings illuminate that the experience of "national success" in a highly male-dominated sport is a breeding ground for male-perpetrated, alcohol-related domestic abuse.

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Supplemental Material

Table S1
Non-domestic violent cases by gender

	Dependent variable:			
	Number of other violent abuse cases per day			
	Male to Male	Male to Female	Female to Female	Female to Male
	(1)	(2)	(3)	(4)
Tournament on	0.037	0.050**	0.041	0.051
	(0.026)	(0.021)	(0.038)	(0.036)
England win	0.013	0.019	−0.031	0.174
	(0.082)	(0.067)	(0.111)	(0.112)
England draw	0.089	0.012	0.115	0.042
	(0.094)	(0.078)	(0.139)	(0.132)
England loss	0.018	0.028	0.088	0.118
	(0.082)	(0.066)	(0.114)	(0.108)
After England	0.085	0.070	0.181**	0.149**
	(0.050)	(0.042)	(0.071)	(0.067)
Alcohol:Tournament on	−0.027	−0.086**	−0.077	−0.167**
	(0.055)	(0.038)	(0.087)	(0.073)
Alcohol:England win	0.391**	0.613***	0.441*	−0.114
	(0.158)	(0.109)	(0.251)	(0.199)
Alcohol:England draw	0.071	0.102	0.127	−0.337
	(0.192)	(0.137)	(0.361)	(0.254)
Alcohol:England loss	0.296*	0.057	−0.023	0.027
	(0.153)	(0.112)	(0.237)	(0.207)
Alcohol:After England	0.208*	0.053	−0.119	−0.158
	(0.100)	(0.072)	(0.163)	(0.136)
Number of days	3,017	3,017	3,017	3,017

[a] *p<0.1; **p<0.05; ***p<0.01
[b] *Estimates are exponentiated coefficients from a series of negative binomial regressions (based on tests of overdispersion) with year, month, day of week, Christmas, New Year's eve controls interacted with alcohol; standard errors in parentheses*

Table S2
Characteristics of domestic abuse cases reported on match days

	Dependent variable:	
	Newly Reported Yes=1, No=0	Public Location Yes=1, No=0
	(1)	(2)
Tournament on	−0.037	0.021
	(0.030)	(0.037)
England win	0.011	0.167
	(0.089)	(0.110)
England draw	0.082	0.014
	(0.121)	(0.138)
England loss	−0.099	0.337***
	(0.086)	(0.099)
After England	0.035	0.070
	(0.056)	(0.068)
Alcohol:Tournament on	0.087	0.063
	(0.060)	(0.080)
Alcohol:England win	0.093	0.104
	(0.156)	(0.196)
Alcohol:England draw	−0.151	−0.016
	(0.233)	(0.306)
Alcohol:England loss	0.221	0.044
	(0.171)	(0.198)
Alcohol:After England	−0.036	0.042
	(0.108)	(0.143)
Number of cases	251,976	279,777

[a] *$p<0.1$; **$p<0.05$; ***$p<0.01$
[b] *Estimates are log odds from a series of logistic regressions with year, month, day of week, Christmas, New Year's eve controls interacted by alcohol, where every observation is a reported domestic abuse case; cases that happened in 2010 were excluded from the first regression; standard errors clustered by victim-offender pairs are in parentheses*