

## BRIEF REPORT

## Winning, losing, and violence

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**Background:** Although international sports events attract huge interest, and results can be a barometer of popular national standing, their impact on violent behaviour has not been investigated.

**Methods:** Associations between assault related emergency department (ED) attendances and international sporting events (home and away rugby and soccer matches) in a European capital city (Cardiff) served by one ED, between 1 May 1995 and 30 April 2002 were investigated. The frequency of assault related ED attendances were studied relative to whether the national team won or lost, controlling for potential covariates: match attendance, match location (home/away), results (win/lose), net scores, and day of match (weekend/weekday). Multiple linear regression was used to identify significant associations with ED assault related attendances.

**Results:** Matches which the Wales team won ( $p=0.03$ ), match attendance ( $p<0.001$ ), and weekend matches ( $p<0.001$ ) were positively associated with ED assault related injury attendances. Assault frequency measured in this way was no different for home and away matches.

**Conclusions:** Assault injury resulting in ED treatment was more frequent when national teams won than when they lost. Sport type made no difference. Violence prevention efforts should be increased on international match days, when the national team is expected to win, when match attendance is large, and for away as well as home matches.

Violence is a major cause of physical and psychological injury and death. Alcohol, illicit drug trade and use, genetic predisposition, media violence, family stress, unemployment, and lack of community cohesion have all been linked to assault related injury.<sup>1</sup> Violence is also associated with some sporting events.<sup>2</sup> However, associations between international sport and violence have not been investigated. The main aim of this study was to determine whether winning and losing major international sporting events was associated with violence related injury. Emergency department (ED) treatment for assault related injury was studied, controlling for location (home matches played in Cardiff/away matches played in the opponent's country), match attendance, net score, and match day (weekend/weekday) of international rugby and soccer matches. International rugby and soccer matches in Cardiff, the Welsh capital and largest city in Wales, often attract in excess of 70 000 fans, in a city with a population of approximately 300 000. Two thirds of the population of Wales reside within 50 miles of the capital. International rugby and soccer matches are by far the most popular spectator sports in Wales.

## METHODS

Cardiff is served by one ED, a mile from the national stadium, which is home to both Welsh international rugby and soccer

teams, situated in the city centre. The close proximity of the stadium, ED, and the city centre is important, because accessibility to ED is a determinant of injury related ED attendance.<sup>3</sup> Assault related ED attendances were computer coded throughout the study period: 1 May 1995 to 30 April 2002, a period in which 106 consecutive home and away international rugby ( $n=74$ ) and soccer ( $n=32$ ) matches took place. Data on match attendance, match day (weekend/weekday), and match scores were obtained from official statistics.

## RESULTS

Overall, 27 840 ED attendances for assault related injury were recorded over the seven year period. Match days (as peak ED attendance is near midnight, the sum of admissions for match day and the following day were used as the dependent variable) were associated with more assault attendances (mean 30.28, SD 13.94,  $n=115$ ) than days where no match was played (mean 21.92, SD 9.88,  $n=2441$ ;  $t=8.87$ ,  $p<0.0001$ ). Multiple linear regression (ANCOVA) was used to determine the relation between the Welsh teams' success/failure and assault related attendance on match days. The statistical model controlled for the influence of potential covariates (binary and continuous): whether the match was played on a weekend or a weekday; attendance at the match; whether the match was played in Cardiff or in the opponent's country, and sport played (rugby or soccer). Net score (calculated by subtracting opponent score from the home country score and dividing by the range of scores for all matches of that type was included to account for the different scoring methods in rugby and football).

Analysis shows that match result (win or lose) was associated with significant variation in assault related injury ED attendances. Assault attendances for matches which Wales won (mean 32.56, SD 15.32, 95% CI 28.25 to 36.86,  $p<0.05$ ) were significantly greater than for matches where Wales lost (mean 25.38, SD 12.36, 95% CI 22.04 to 28.72). Match attendance had a significant positive association with ED assault related attendance ( $p<0.001$ ). The location of the match (home or away) was not significantly associated with assault attendance (for home matches, mean 30.78, 95% CI 27.83 to 33.72,  $n=47$ /for away matches, mean 27.15, 95% CI 24.5 to 29.8,  $n=57$ ,  $p=0.056$ ). Assault related injury attendances were significantly higher on weekends (Saturday/Sunday) when matches were played (mean 17.53, SD 6.95,  $n=72$ ) than when no matches were played (mean 12.65, SD 5.16,  $n=658$ ,  $p<0.001$ ).

The principal finding of this study is that assault injury resulting in ED treatment was associated with the outcome of international rugby and soccer matches. When the national team won (rugby and soccer), irrespective of the location (home or away) mean match day ED assault attendance was greater than when the national team lost. This finding is important for community safety and violence prevention. Interestingly, when the national team played in another country the population was affected by the outcome to the same significant extent as the population on home match

days. Therefore, from these findings, violence prevention associated with away international rugby and soccer matches is as important as with home matches, perhaps particularly in and around licensed premises where people watch matches on television.

These analyses suggest that assault may not be the result of negative factors associated with a national team losing but the result of a positive event (winning). It is possible that levels of self confidence, assertiveness, or patriotism which may be heightened following a win are important factors.<sup>2</sup> A previous study found that after their college soccer team won, spectators were more likely to be in a heightened emotional state.<sup>4</sup> Furthermore, domestic violence has been found to occur more often when the male assailant's local team wins.<sup>5</sup> Winning prompts celebration, a key component of which is alcohol consumption, and prompts the formation of crowds of intoxicated individuals, making interpersonal physical assertiveness more likely. Future studies should examine interactions between the independent variables—namely match day, match attendance, location (home or away), net score, and result (win or loss) in greater detail, and the influence of major non-sporting events on violence.

### CONTRIBUTORS

V Sivarajasingam participated in data collection, interpretation of results, and preparation of the manuscript. S Moore was responsible

for statistical analyses, interpretation, and preparation of the manuscript. J P Shepherd designed the original study and supervised data collection and preparation of manuscript.

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Competing interest: the authors declare no competing interest.

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