

# Methods may matter in injury surveillance: “how” may be more important than “what, when or why”

**AUTHORS:** Montassar Tabben<sup>1</sup>, Rodney Whiteley<sup>1</sup>, Eirik Halvorsen Wik<sup>1</sup>, Roald Bahr<sup>1</sup>, Karim Chamari<sup>1</sup>

<sup>1</sup> Aspetar Orthopedic and Sports Medicine Hospital, Doha, Qatar

**ABSTRACT:** To examine if and how adjustments in injury surveillance recording methodology may have influenced injury rates. Injury and exposure data were collected among professional male players from the Qatar Stars League from the 2008-2009 season to the 2017-2018 season. There have been four iterations of our data collection methods. In the first five seasons, participation in the programme was voluntary. For seasons 6-7, additional dedicated researchers were tasked with contacting the medical teams every month. At the start of season 8, an electronic recording method was instituted. In the final two seasons, injury surveillance participation was further boosted by reinforced encouragement from institutional management. Overall injury incidence increased from season 5 to season 8. Severe injuries have fallen steadily, but slightly over the ten seasons, whereas mild injuries increased dramatically from seasons 5 to 8. The current data suggest that along with the standard metrics (e.g. injury incidence, injury burden) we also need to clearly report the methods by which data were collected and verified in as much detail as possible. We suggest that sports medicine journals should adopt minimum reporting standards and perhaps checklists could be a useful step forward.

**CITATION:** Tabben M, Whiteley R, Wik EH et al. Methods may matter in injury surveillance: “how” may be more important than “what, when or why”. *Biol Sport*. 2020;37(1):3–5.

Received: 2019-09-27; Reviewed: 2019-10-29; Re-submitted: 2019-10-30; Accepted: 2019-10-30; Published: 2019-11-19.

Corresponding author:

**Montassar Tabben**  
 ASPREV Dept., ASPETAR  
 Orthopedic and Sports Medicine  
 Hospital, P.O. Box 29222. Doha  
 Qatar.  
 Phone: (+974) 66 18 09 75  
 E-mail:  
 Montassar.tabben@aspetar.com

**Key words:**

Injury and prevention  
 Injury surveillance  
 Injury incidence  
 Methodology  
 Soccer

## INTRODUCTION

Injury surveillance provides essential information to drive the development and implementation of injury prevention strategies in sporting environments, with the end goal of reducing the injury burden and maximizing performance. [1-3] In order to compare injury outcomes across seasons or between teams and assess whether a preventative measure has had the desired effect, it is essential that the recording methodology is both valid and consistent. [4]

While it has been suggested that differences in recording method, varying levels of data quality control, and support from governing bodies can have an impact on injury outcomes, [2] there are few concrete examples in the published literature. Therefore, the aim of this report was to use ten years' worth of injury data from an ongoing surveillance programme in professional football to highlight how alterations in the methodologies could potentially explain fluctuations in injury outcomes.

## MATERIALS AND METHODS

### *Procedure*

This prospective epidemiological study recorded injuries among professional male players from the Qatar Stars League (QSL), together with exposure data (match and training) from the 2008-2009 season to the 2017-2018 season. Only injuries occurring during team

activities (training sessions and matches) were recorded, i.e. any injury occurring outside the teams' activity was excluded. An injury was defined as any physical complaint sustained by a player during a scheduled match or training session resulting in the inability to fully partake in the next football training or match. [5] Injuries were classified as mild (less than 8 days of time loss), moderate (8 to 28 days lost) or severe (more than 28 days).

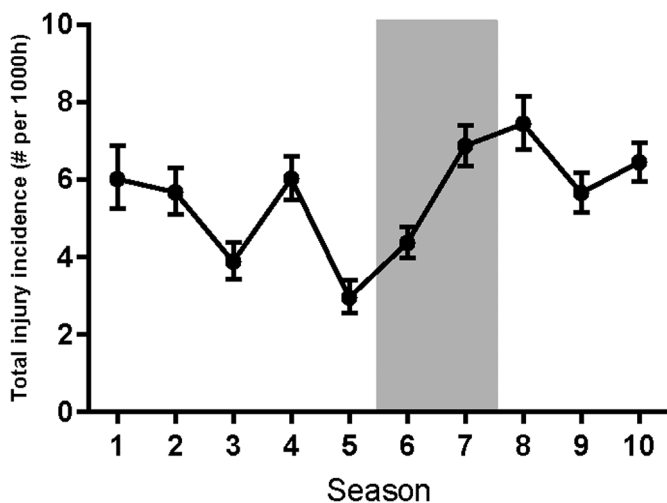
The study population included 230 (for season 2008/2009), 354 (2009/2010), 319 (2010/2011), 423 (2011/2012), 413 (2012/2013), 407 (2013/2014), 527 (2014/2015), 324 (2015/2016), 496 (2016/2017) and 489 (2017/2018) players.

### *Changes over time*

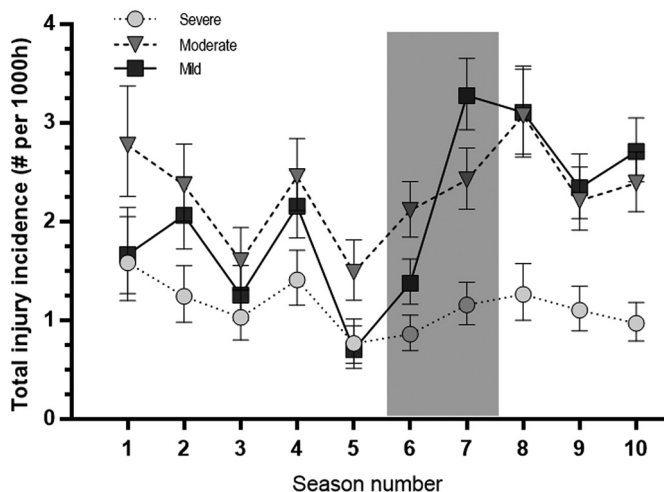
Historically, there have been four iterations of our data collection methods:

1. During the first five seasons, participation in the programme was voluntary, and otherwise busy practitioners were doing their best to participate despite relatively short-staffed medical teams.
2. From season 6, dedicated researchers from the newly formed Aspetar Injury & Illness Prevention Program (ASPREV) were tasked with contacting the medical teams every month and following up on their monthly reporting.

3. At the start of season 8, an electronic recording and reporting method (i.e. Excel files) was instituted which allowed individual monthly feedback on team injury rates. This transiently decreased participation rate (presumably due to habituation to the new electronic tools), but later in the season attracted users with enhanced monthly feedback on injury rates and comparisons for the first time.
4. In the final 2 seasons, injury surveillance participation was further boosted by: (i) reinforced encouragement from institutional management, and (ii) additional software features that allowed practitioners to compare their own team against the pooled league data.



**Figure 1.** Total injury incidence across ten seasons of injury surveillance in the Qatar Stars League (2008-2009 to 2017-2018).



**Figure 2.** Total injury incidence by severity across ten seasons of injury surveillance in the Qatar Stars League (2008-2009 to 2017-2018). Note the apparent overall relatively steady, slight reduction in the severe injury category, and the sharp increase in mild injuries in seasons 6 and 7 (shaded area), which appears maintained through seasons 8 to 10 and coincided with changes in the data collection procedures. Mild: less than 8 days of time loss, Moderate: 8 to 28 days lost, Severe: >28 days.

## RESULTS

Overall injury incidence (95% CI) increased from season 5 to season 8 (Figure 1).

Injury incidence (95% CI) by severity categories are presented in Figure 2.

## DISCUSSION

We recently reviewed our epidemiologic findings as well as our data collection procedures over ten years and believe there are lessons to be learned from understanding the methodology by which these data were captured and should be interpreted.

To best understand between-season differences we need to consider potential sources of bias from the surveillance methods used, potentially masking real changes in injury rate caused by e.g. increased game pace and greater physical loads [6] or successful implementation of an injury prevention programme. [7] A cursory examination of Figure 1, representing ten years of Qatar Stars League surveillance data, could lead to the conclusion that the overall injury rate increased significantly from season 5 (2.9 injuries per 1000 h) to season 8 (7.4 injuries per 1000 h). However, looking at the injury incidence by severity during the same time period, it seems that “severe injuries” fell steadily, but slightly, whereas mild injuries increased dramatically from seasons 5 to 8. Conceivably, recent injury prevention practices could be questioned in light of these data; however, a qualitative understanding of the actual procedures surrounding the data collection process leads to a different appraisal.

We believe that it is extremely unlikely that a severe injury – causing time loss of more than 28 days – would be missed during the ten-year period; however, it is plausible that the apparent increase in the rate of less severe injuries from the beginning of season 6 represents an artefact caused by improved data control and feedback. Upon reflection, we posit that the apparent uptick in incidence of mild injuries over seasons 6 and 7 is mainly due to implementation of dedicated staff whose job included contacting team medical staff to assist in documenting injury data. We suspect that this could explain at least some of the apparent increase in the incidence of injuries that might be considered of lesser importance (players missing a week or less of activity with their clubs). These might otherwise not have been forefront in the minds of busy medical staff whose primary job is not reporting injuries, but rather managing and treating them. Previous studies have shown that not all injuries, especially the less severe ones, are captured by standard surveillance methods, [8] and that capture rates are also influenced by the definition of injury used. [9]

This presents at least two challenges in our attempts to reduce the injury burden within the league. Firstly, we cannot assess the effects of any of our injury prevention efforts from the first season to the last, except for severe injuries. Secondly, while we will look to other leagues for information regarding successful injury reduction strategies, we question the veracity of comparison of our league data

with other leagues that have different epidemiological approaches to those described here. [7, 9]

It is particularly to this second point that we wish to draw the attention of those working in sports injury epidemiology. While we look to others for examples of *what* works, in terms of interventions aimed at reducing injury risk, we rarely look to the underlying methods to see *how much* these approaches are having an effect and the potential sources of any differences. The current data suggest that along with standard metrics (injury incidence, injury burden, etc.) we also need to clearly report the methods by which data were collected and verified in as much detail as possible.

### CONCLUSION

We suggest that sports medicine journals should adopt minimum reporting standards and perhaps checklists could be a useful step

forward, in order to allow better interpretation and ultimately better implementation of injury prevention strategies in sports. [10]

### Competing interests

None declared.

### Ethics

The study was approved by the Anti-Doping Laboratory Qatar Ethics Institutional review board (IRB E2017000252).

### Acknowledgements

The authors would like to sincerely thank the National Sports Medicine Programme (NSMP) senior management and all the NSMP team medical staff members.

### REFERENCES

1. van Mechelen W, Hlobil H, Kemper HC. Incidence, severity, aetiology and prevention of sports injuries. A review of concepts. *Sports Med.* (Auckland, NZ). 1992; 14(2):82-99.
2. Ekegren CL, Gabbe BJ, Finch CF. Sports Injury Surveillance Systems: A Review of Methods and Data Quality. *Sports Med.* (Auckland, NZ). 2016; 46(1):49-65.
3. Chamari K, Bahr R. Training for Elite Sport Performance: Injury Risk Management Also Matters! *Int J Sports Physiol Perform.* 2016;11(5):561-2.
4. Brooks JH, Fuller CW. The influence of methodological issues on the results and conclusions from epidemiological studies of sports injuries: illustrative examples. *Sports Med.* (Auckland, NZ). 2006;36(6):459-72.
5. Fuller CW, Ekstrand J, Junge A, Andersen TE, Bahr R, Dvorak J, et al. Consensus statement on injury definitions and data collection procedures in studies of football (soccer) injuries. *Scand J Med Sci Sports.* 2006;16(2):83-92.
6. Gabbett TJ. The training-injury prevention paradox: should athletes be training smarter and harder? *Br J Sports Med.* 2016;50(5):273-80.
7. Meeuwisse WH, Love EJ. Athletic injury reporting. Development of universal systems. *Sports Med.* (Auckland, NZ). 1997;24(3):184-204.
8. Bjorneboe J, Florenes TW, Bahr R, Andersen TE. Injury surveillance in male professional football; is medical staff reporting complete and accurate? *Scand J Med Sci Sports.* 2011;21(5):713-20.
9. Orchard J, Hoskins W. For debate: consensus injury definitions in team sports should focus on missed playing time. *Clin J Sport Med.* 2007;17(3):192-6.
10. Mountjoy M, Junge A, Alonso JM, Clarsen B, Pluim BM, Shrier I, et al. Consensus statement on the methodology of injury and illness surveillance in FINA (aquatic sports). *Br J Sports Med.* 2016;50(10):590-6.