Journal of Athletic Training 2018;53(8):725–728
doi: 10.4085/1062-6050-53-04

www.natajournals.org

Athletic Trainers: The Originators of and Continued Experts in Sports Injury-Surveillance Data Collection

Zachary Y. Kerr, PhD, MPH

Department of Exercise and Sport Science, University of North Carolina at Chapel Hill

Throughout my career as a sports injury epidemiologist, I have been impressed with the ability of athletic trainers (ATs) to tackle both research and clinical topics related to the health and safety of the athletes with whom they work. An early introduction to this melding of the empirical and the applied came through my graduate studies, as I worked with my fellow sports injury epidemiologists R. Dawn Comstock, PhD, and Stephen W. Marshall, PhD, on numerous injury-surveillance projects, primarily with the High School Reporting Information Online (HS RIO) program. My work continued as the director of the National Collegiate Athletic Association (NCAA) Injury Surveillance Program (ISP) under the mentorship of AT and researcher Thomas P. Dompier, PhD, ATC. Their mentorship and guidance allowed me not only to learn the "ins and outs" of sports injury surveillance but also to appreciate the important contributions of those individuals who collected the data: the ATs.

As described in articles published in the *Journal of Athletic Training* (*JAT*) over the past decade,[1–7] ATs face numerous challenges that may hinder their ability to have a productive work-life balance, including long work hours, limited resources, and administrative duties that go beyond the care of their patients. Yet, despite these countless tasks, we read the many studies that rely on their expertise as educated, experienced data collectors who identify, diagnose, and manage injuries as they occur. Even as the surveillance methods changed, from pen-and-paper based to Web based, ATs continued to collect the information that has helped a variety of organizations develop data-driven, evidence-based decisions regarding rules and policies related to student-athlete health and safety.[8,9] Such work undeniably demonstrates the value of the presence of ATs at all sporting events.

On many occasions, I have stated publicly that ATs are the "gold standard" of sports injury data collection; other authors[10,11] have noted similar sentiments. And as you will read, organizations such as the National Federation of State High School Associations (NFHS) and the NCAA hold sports injury-surveillance data in high regard. The series of articles that will be published in the upcoming issues of the *JAT* summarizes the data collected during the first decade of Web-based sports injury surveillance. Included are data collected after the NCAA-ISP's transition to a Web-based interface (2004–2005 through 2013–2014 academic years) as well as the first 9 years of data collected via HS RIO (2005–2006 through 2013–2014 academic years).

However, I envision this series as an opportunity to honor the many ATs who volunteer their time and efforts to collect the data that help researchers identify injury incidence, as well as related etiologies and prevention strategies.[12] As noted in the Acknowledgments section of every manuscript that I have written with data collection conducted by ATs, "Their efforts are greatly appreciated and have had a tremendously positive effect on the safety of student-athletes." I look forward to continuing to work with these outstanding individuals as they help guide us through the next decade of Web-based sports injury-surveillance data collection.

REFERENCES

1. Mazerolle SM, Goodman A, Pitney WA. Achieving work-life balance in the National Collegiate Athletic Association Division I setting, part I: the role of the head athletic trainer. *J Athl Train*. 2015; 50(1):82–88.
2. Goodman A, Mazerolle SM, Pitney WA. Achieving work-life balance in the National Collegiate Athletic Association Division I setting, part II: perspectives from head athletic trainers. *J Athl Train*. 2015;50(1):89–94.
3. Mazerolle SM, Pitney WA, Eason CM. Experiences of work-life conflict for the athletic trainer employed outside the National Collegiate Athletic Association Division I clinical setting. *J Athl Train*. 2015;50(7):748–759.
4. Mazerolle SM, Pitney WA, Casa DJ, Pagnotta KD. Assessing strategies to manage work and life balance of athletic trainers working in the National Collegiate Athletic Association Division I setting. *J Athl Train*. 2011;46(2):194–205.
5. Mazerolle SM, Bruening JE, Casa DJ. Work-family conflict, part I: antecedents of work-family conflict in National Collegiate Athletic Association Division IA certified athletic trainers. *J Athl Train*. 2008; 43(5):505–512.
6. Mazerolle SM, Bruening JE, Casa DJ, Burton LJ. Work-family conflict, part II: job and life satisfaction in National Collegiate Athletic Association Division IA certified athletic trainers. *J Athl Train*. 2008;43(5):513–522.
7. DeFreese J, Mihalik JP. Work-based social interactions, perceived stress, and workload incongruence as antecedents of athletic trainer burnout. *J Athl Train*. 2016;51(1):28–34.
8. Hootman JM, Dick R, Agel J. Epidemiology of collegiate injuries for 15 sports: summary and recommendations for injury prevention initiatives. *J Athl Train*. 2007;42(2):311–319.
9. Kerr ZY, Dompier TP, Snook EM, et al. National Collegiate Athletic Association Injury Surveillance System: review of methods for

2004–2005 through 2013–2014 data collection. *J Athl Train*. 2014; 49(4):552–560.

10. Yard EE, Collins CL, Comstock RD. A comparison of high school sports injury surveillance data reporting by certified athletic trainers and coaches. *J Athl Train*. 2009;44(6):645–652.
11. Lombardi NJ, Tucker B, Freedman KB, et al. Accuracy of athletic trainer and physician diagnoses in sports medicine. *Orthopedics*. 2016;39(5):e944–e949.
12. Van Mechelen W, Hlobil H, Kemper HC. Incidence, severity, aetiology and prevention of sports injuries. *Sports Med*. 1992;14(2): 82–99.

High School Sports Injury Surveillance: "Grab a Mitt; Get in the Game"

William Heinz, MD

Former Chair of the National Federation of State High School Associations Sports Medicine Advisory Committee, Portland, ME

My introduction to the HS RIO program was when I attended my first NFHS Sports Medicine Advisory Committee (SMAC) meeting. At my spot on the conference table was a 3-in-thick binder with seemingly endless pages of data concerning injuries among high school sports, all collected over the previous 4 years. I remember flipping through the binder, being completely overwhelmed by the contents and wondering who was analyzing all these data. Fast forward to today and the answer to the question concerning data analysis is partially contained in upcoming sections of the *JAT*. For more than 10 years now, R. Dawn Comstock, PhD, and her team of ATs, graduate students, and research assistants have worked diligently to collect data on the injuries we see in high school athletics and activities. This effort has been strongly supported by the NFHS. Part of the mission of the NFHS SMAC is "to provide information, vision, and guidance to the NFHS, while emphasizing the health and safety of students participating in interscholastic sports and activities."[1] The information gained from HS RIO helps to fulfill both this mission and one of the goals of the NFHS SMAC, which is "to allow the NFHS SMAC to initiate and support recommendations to the NFHS community intended to reduce risk through possible changes in rules, guidelines, best practices and/or equipment."[2] Accomplishing this goal requires very accurate injury data, from both the collection and reporting standpoints. This has been the hallmark of Dr Comstock and her team. Key to this endeavor are the efforts of the ATs working in the schools and caring for the injured athletes to make sure the reported injury data are correct and accurate. These individuals are the most important element in the entire HS RIO program. Without their hard work and attention to detail, the injury data would be less valuable and the HS RIO program could lose its hard-earned credibility.

An important aspect of an ongoing injury-reporting system such as HS RIO is the ability to track injury rates before and after an NFHS rule change. This allows us to evaluate the NFHS rule change from the viewpoint of whether the change led to a reduction in injuries or possibly to the unintended consequence of actually increasing injuries. An example is the 2011 NFHS rule change in girls' field hockey requiring high school players to wear ASTM-certified eye protection. This NFHS rule change was prompted by several catastrophic eye injuries in field hockey players; the incidence rate of these injuries is very low, but when one occurs, it has a dramatic effect on the athlete's future quality of life. Realizing this, the NFHS SMAC recommended to the NFHS Field Hockey Rules Committee that protective eyewear be required in girls' field hockey. This rule was put into effect, and since that time, no catastrophic eye injuries have been reported in girls' field hockey. Almost as important as protecting against eye injuries in this sport was being able to show that requiring protective eyewear did not result in increases in other field hockey injuries (such as concussions or knee injuries). Without a very accurate and comprehensive injury-reporting system, this information would have been unavailable, and it would have been impossible for the NFHS to stand behind its decision to require protective eyewear in girls' field hockey. A nationwide, comprehensive high school injury-reporting system with data analysis is critical to helping the NFHS achieve its mission of improving the health and safety of all participants.

As you can tell, I am a strong advocate of a systematic injury-reporting system, especially at the high school level. I strongly encourage every AT who works with high school athletes to participate in the HS RIO program. With more data points, we can continue to make high school sports and activities as safe as possible. As we say to residents interested in sports medicine: "Don't just stand there watching. Grab a mitt; get in the game."

REFERENCES

1. Sports Medicine Advisory Committee mission statement and goals. National Federation of State High School Associations Web site. https://www.nfhs.org/sports-resource-content/sports-medicine-advisory-committee-smac-mission-statement-and-goals/. Accessed April 14, 2017.
2. Sports medicine. National Federation of State High School Associations Web site. http://www.nfhs.org/resources/sports-medicine/. Accessed April 14, 2017.

The National Collegiate Athletic Association Injury Surveillance Program at 35: More Vital Than Ever

John T. Parsons, PhD, ATC*; Brian Hainline, MD†

*Sport Science Institute and †Chief Medical Officer, National Collegiate Athletic Association, Indianapolis, IN

The mission of the NCAA's Sport Science Institute (SSI) is to promote and develop safety, excellence, and wellness in collegiate student-athletes and to foster lifelong physical and mental development.[1] This is a challenging task in an organization of 480 000 student-athletes and 1100 member schools organized into 3 diverse membership divisions that reflect unique philosophies and opportunities offered by these schools. For example, in spite of the significant public attention given to Football Bowl Subdivision schools and the NCAA Division I Basketball Tournament, the largest membership division, in both the percentage of member schools and the percentage of athletes, is Division III.

To accomplish its mission, the SSI has identified 9 strategic priorities that are the primary targets for its work and the result of listening to the needs of our student-athletes, the ATs and physicians at our member schools who care for them, and our scientific and medical partners. These priorities reflect either critical health and safety concerns facing our student-athletes (eg, concussion, cardiac care, mental health) or foundational topics deemed critical to our ability to address those concerns. An example of a strategic priority in this latter category is data-driven decisions.

Data-driven decisions are a strategic priority for the SSI for several reasons. First, our work is grounded in the science and medicine of sport. This carries a natural obligation to evidence-based decision making, which is a hallmark of both the scientific and medical communities. It is also characteristic of responsible policy making, a role the SSI plays in close partnership with NCAA member schools. Second, and perhaps more importantly, we position our work within the framework of public health and fully believe that the only way to improve the health and well-being of a population of student-athletes as large as ours is through a commitment to public health principles. An essential aspect of the public health approach is the use of data to understand the nature and scope of a problem and then to be able to evaluate the effectiveness of any intervention applied to that problem.

The most important tool for the NCAA when making decisions in this data-driven way is the NCAA-ISP. The NCAA has supported the NCAA-ISP since 1982; during this time, the system has served as the primary source of epidemiologic data about injuries occurring to NCAA student-athletes.[2] The NCAA-ISP data are used to guide decisions made by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports, the membership committee with legislative responsibility for student-athletes' health and safety. In addition, the data are central to annual, sport-specific reports provided to every sport rules committee to help guide their rulemaking to make sport safer. Lastly, through a formalized process, faculty and others affiliated with an academic institution can request raw data for analysis and publication. Since 1982, data from the NCAA-ISP have contributed to 70 peer-reviewed publications on the incidence and nature of injury arising from participation in collegiate-level sports.[3]

The NCAA-ISP is a voluntary program, dependent on the individual participation decisions of NCAA member schools. In most cases, the AT decides on the sponsored sports for which the school will submit data. Historically, participation decisions were influenced by the time athletic training staff had to dedicate to the extra tasks required, which from 1982 to 2003 required completion of pen-and-paper data forms.[4] However, starting in 2004, data could be extracted directly from the electronic medical record (EMR) system regularly used by the athletic health care staff if that EMR was certified to certain data-sharing protocols.[4] A certified EMR allows for the secure sharing of de-identified data with just the click of a button and eliminates the need for paper data forms. Currently, 5 EMR systems are certified, and several more are in the process of gaining certification.

In spite of these efforts to improve the ease of participating, variability in data sharing exists across all NCAA sports. For example, participation for the 2015–2016 academic year ranged from 15.4% of all schools sponsoring men's ice hockey to less than 1% of schools sponsoring cross-country and swimming and diving. Additional data suggested that across all NCAA divisions, only 14% of member schools participated in the NCAA-ISP for at least 1 sport. Low participation levels in some sports prevent the use of certain statistical analyses because the data are not robust enough to support them. Consequently, either the data must be aggregated across multiple years or certain questions cannot be addressed effectively due to a lack of statistical certainty. When research questions about specific aspects of athletic competition are raised (for example, examining the difference between injury rates before and after the implementation of a new rule), a higher rate of NCAA-ISP participation is required to achieve sufficient statistical power. A considerable increase in NCAA-ISP participation may be achievable in the very near future. We are hopeful that greater awareness and education will increase participation by these schools, especially given the minimal additional effort on their part.

Recent articles in this journal[5,6] have introduced ATs to the idea of population health and the natural role that ATs play as public health providers. Our desire is to partner with the athletic training community in this role of public health provider, for we recognize that NCAA member schools, and especially their student-athletes, stand to benefit from viewing and pursuing their work in support of student-athletes' health and safety from the same public health perspective. Sound decision making based on robust,

population-wide data is the cornerstone of this effort, and we need continued assistance from the AT community to ensure a meaningful source of such data going forward.

REFERENCES

1. About the SSI. National Collegiate Athletic Association Web site. http://www.ncaa.org/sport-science-institute/about-ssi. Accessed December 19, 2016.
2. Dick R, Agel J, Marshall SW. National Collegiate Athletic Association Injury Surveillance System commentaries: introduction and methods. *J Athl Train*. 2007;42(2):173–182.
3. Publications. Datalys Center for Sports Injury Prevention and Research Web site. http://www.datalyscenter.org/publications/. Accessed December 19, 2016.
4. Kerr ZY, Dompier TP, Snook EM, et al. National Collegiate Athletic Association Injury Surveillance System: review of methods for 2004–2005 through 2013–2014 data collection. *J Athl Train*. 2014;49(4):552–560.
5. Hoffman M. The athletic trainer's contribution to public health practice. *Athl Train Educ J*. 2016;11(2):70–71.
6. Hoffman M, Bovbjerg V, Hannigan K, et al. Athletic Training and Public Health Summit. *J Athl Train*. 2016;51(7):576–580.