

# Concussion Management Practices and Socioeconomic Disparities: An Examination of Baseline Testing



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## BACKGROUND & OBJECTIVES

- Sport-related concussion is common among school-aged students, with an estimated 1 to 2 million documented brain injuries a year (Bryan et al., 2016).
- To ameliorate incidence rates and improve outcomes for injured student-athletes, researchers have devoted time and attention to identifying best practices in the prevention and management of sport-related concussion (McCrory et al., 2017)
- Despite sound evidence, only a limited number of best practices have been codified into legislation, and policies vary widely across states (Thompson et al., 2016).
- In Massachusetts, progressive concussion management practices have been adopted which outline how school stakeholders should care for student-athletes.
- However, one commonly cited best practice in concussion management, baseline testing, is not currently legislated in Massachusetts.
- As baseline testing can be resource intensive and is not legally mandated, implementation across schools may be inconsistent.
- Moreover, implementation may be impacted by the sociodemographic profile of the school such that schools with more resources may be able to implement more comprehensive baseline testing than schools with less resources; however, this relationship has not yet been explored.
- Therefore, the purpose of the current study was to evaluate the relationship between baseline testing practices and socioeconomic status of Massachusetts high schools.

## DISCUSSION

- Results of the current study suggest that **a large proportion of schools in Massachusetts implement baseline cognitive testing, however, testing remains substantially varied across schools.**
- Moreover, results indicate that **schools with a higher proportion of low-income students are less likely to implement comprehensive baseline testing.**
- These **results are consistent with previous research** which revealed that in schools with lower socioeconomic status, concussion-related knowledge among stakeholders was lower (Bloodgood et al., 2013; Donnell et al., 2018; Wallace et al., 2018).
- These findings suggest that **student-athletes' care surrounding concussive injury may indeed be impacted by the socioeconomic profile of the school they attend.**
- Best practices in concussion management suggest that baseline testing is an important part of comprehensive care to improve detection and post-concussion treatment.
- It is possible then, that **students who do not receive adequate baseline testing are more vulnerable to long-term concussive effects as well as multiple concussive injuries, and post-concussive syndrome due to improper monitoring.**

## METHOD

Following institutional approval and in collaboration with the Massachusetts Department of Public Health (MDPH), the authors of the current study sent surveys to athletic directors (ADs) in Massachusetts.

### Participants

- Participants in the current study were ADs employed at public high schools across Massachusetts.
- Participants needed to be able to read and write in English to participate in the current study.
- Participants were eligible for the current study if they had completed all survey questions, including providing the name of their school, and if their school had a recorded economic disadvantage rate (%EDR) for the 2017-2018 academic year.

### Measures

- To assess the level of baseline testing in each school, athletic directors were asked to identify the current extent of their baseline testing practices. Responses were coded using a Likert-type scale whereby 0=no students, 1=some students, and 2=all students.
- To assess the socioeconomic status of the school, the %EDR for each school was identified using public record.
  - The %EDR represents the percentage of students in a school enrolled in one or more of the following state-administered programs: the Supplemental Nutrition Assistance Program, the Transitional Assistance for Families with Dependent Children, the Department of Children and Families' foster care program, and MassHealth (Medicaid) (Massachusetts Department of Elementary and Secondary Education, n.d.).

### Analysis

- To examine the relationship between the %EDR of the school and the schools' current use of baseline testing, point-biserial correlation coefficients were calculated between the %EDR and the level to which athletic directors reported using baseline testing in their school.
- An alpha level of .05 was used

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## RESULTS

- The overall **response rate to the survey was 75% (260/346)**. Following elimination of duplicate schools (n=84) and private schools (n=27), 149 public school ADs remained in **the sample thereby representing 41% of surveyed ADs in Massachusetts.**
- Overall, **the majority (n=117) of ADs reported that they currently implement baseline testing in their school to some extent (82.5%).**
- Among respondents, 4% (n=5) indicated that they currently implement baseline testing for *all* students, **78% reported that some of their students receive baseline testing, and 18% reported that they do not implement baseline testing at all.**
  - Among those who reported some testing, 14% reported all students in engaged in *certain* extracurricular activities receive testing, 55% indicated that all students in any extracurricular activity receive testing, and 9% reported that all students in certain grades receive testing.
- The average %EDR of schools who test all students was 20.9, for those who tested some students, the average %EDR was 17.2, and among schools who did not test any students, the average %ERD was 24.8.
- **Results of the point-biserial correlation analysis indicate a significant negative relationship between the economic disadvantage rate of a school and the level to which a school implements baseline testing ( $r^2=.250$ ,  $p=.015$ ).**

## CONCLUSIONS & FUTURE DIRECTIONS

- Results of the current study reveal an important gap in the translation of best practices in concussion management to both public health policy as well as professional practice.
- In practice, the implications for inadequate baseline testing can be far reaching such that student-athletes may be more susceptible to premature return-to-play and return-to-learn, and thus more vulnerable to deleterious outcomes following a concussive injury.
- These findings also prompt consideration for other practices in concussion management that may be impacted by the resources available to a school.
- To better understand the relationship between school sociodemographic variables and concussion management, research should be conducted to comprehensively evaluate current concussion management practices across a variety schools.
- Moreover, evaluation of implementation should extend beyond a single stakeholder (i.e., AD) and a single state (i.e., Massachusetts), given the documented variability of concussion policies across states and variability in stakeholder knowledge.