

Population-Based Surveillance for Methicillin-Resistant *Staphylococcus aureus* Infections among High School Football and Wrestling Participants — Nebraska, 2008–2011

Bryan F Buss, DVM MPH
Career Epidemiology Field Officer (CEFO)
Nebraska Department of Health and Human Services

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Presenter Disclosures

Bryan F Buss

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No relationships to disclose

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BACKGROUND

Community-Acquired Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA)

- Cause of non-healthcare associated skin infections among persons of all ages
- Most common cause of skin infections among emergency department patients
- Otherwise healthy athletes at higher risk because of several identified risk factors

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Risk Factors Associated with CA-MRSA Infections among Athletes

- Physical skin-to-skin contact
- Sport-induced skin damage
- Body shaving
- Sharing of contaminated equipment, bars of soap, towels, razors, clothing, and other personal items

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Findings of Previous Surveillance*

- Population-based surveillance in Nebraska has found MRSA more prevalent among high school athletic departments than indicated by limited number of outbreak reports
- MRSA established as emerging cause of infections among Nebraska high school athletes from 2006–07 to 2007–08

*Buss BF, Mueller SW, Theis M, Keyser A, Safranek TJ. Population-Based Estimates of Methicillin-Resistant *Staphylococcus aureus* (MRSA) Infections Among High School Athletes—Nebraska, 2006–2008. *J Sch Nurs.* 2009 Aug;23(4):282-91.

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Findings of Previous Surveillance*

- No differences identified in MRSA-infection distribution on basis of grade, location, or number of participants per team
- Substantially higher incidence among participants of contact sports
 - Wrestling
 - Football

*Buss BF, Mueller SW, Theis M, Keyser A, Safranek TJ. Population-Based Estimates of Methicillin-Resistant *Staphylococcus aureus* (MRSA) Infections Among High School Athletes—Nebraska, 2006–2008. J Sch Nurs. 2009 Aug;25(4):282-91.

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Previously Established Incidence Estimates* of Physician-Diagnosed MRSA Infections among Nebraska Athletes

Sport	MRSA incidence per 10,000 participants	
	2006–07	2007–08
Football	5.0	25.1
Wrestling	19.6	60.1

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On-Going Activities

- On the basis of 2007–08 findings, further investigation in Nebraska was recommended to monitor apparent increasing incidence
- Surveillance conducted at regular intervals has since been continued to monitor trends




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Surveillance Objectives

- Establish 2008–09, 2009–10, 2010–11 statewide incidence estimates of MRSA infections among football and wrestling participants
- Determine number of MRSA infections among participants of other fall and winter sports

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METHODS

Methods

- List of official contacts in each Nebraska high school maintained and regularly updated
- MRSA prevention and control resources and findings of ongoing surveillance are regularly provided to schools to foster collaboration, promote athlete health, and enhance response rates

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Methods

- Six Internet-based surveys of all Nebraska high schools during school-years 2008–09, 2009–10, and 2010–11 at completion of respective fall and winter sports seasons
- Surveys completed by school official associated with athletic programs and having knowledge of procedures for prevention, identification, and control of infections among athletes

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Data Collected and Calculations

- Number of schools that offer football and wrestling programs
- Number of football and wrestling participants per school during school-years 2008–09, 2009–10, and 2010–11
- Number of athletes with physician-diagnosed MRSA infections and date of onset, sport, and grade in school
- Calculated statewide attack rates per 10,000 football and wrestling participants in each of the three school years

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RESULTS

Nebraska High School Survey Response Rates and Numbers with Football and Wrestling Programs by School Year and Sport Season

	2008–09		2009–10		2010–11	
	n/N	%	n/N	%	n/N	%
Fall season	239/312	76.6	251/312	80.4	246/311	79.1
(No. with football programs)	(233)	(97.5)	(247)	(98.4)	(240)	(97.6)
Winter season	177/312	56.7	251/312	80.4	226/313	72.2
(No. with wrestling programs)	(138)	(78.0)	(189)	(75.3)	(174)	(77.0)

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Number of Schools Reporting ≥1 Physician-Diagnosed MRSA-Affected Football or Wrestling Participant

	2008–09		2009–10		2010–11	
	n/N	%	n/N	%	n/N	%
Football	15/233	6.4	9/247	3.6	10/240	4.2
Wrestling	10/138	7.2	14/189	7.4	9/174	5.2

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Number of MRSA Cases and Attack Rates by School Year and Sport

Sport	MRSA cases n (median per team) (range per team)			No. participants reported n (median per team) (range per team)			AR per 10,000 Participants*		
	08–09	09–10	10–11	08–09	09–10	10–11	08–09	09–10	10–11
	Football	20 (1) (1–2)	13 (1) (1–4)	13 (1) (1–3)	10,511 (31) (11–285)	11,309 (31) (9–255)	11,518 (33) (8–285)	19.0	11.5
Wrestling	16 (1) (1–5)	17 (1) (1–2)	9 (1) (1)	2,631 (16) (1–76)	3,398 (15) (1–65)	3,205 (15.5) (2–60)	60.8	50.0	28.1

*2007–08 AR per 10,000 Participants
Football 25.1
Wrestling 60.1

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Grade of MRSA-Affected Participants of Football and Wrestling at Time of Onset

Grade	School year					
	2008-09		2009-10		2010-11	
	Football	Wrestling	Football	Wrestling	Football	Wrestling
9 th	2	2	3	4	1	0
10 th	3	5	3	4	3	4
11 th	5	7	3	3	5	4
12 th	10	2	4	6	4	1
All	20	16	13	17	13	9

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Number of MRSA Cases Among Participants of Other Sports by School Year and Sport Season

Season Sport	MRSA cases		
	2008-09	2009-10	2010-11
Fall¹			
Volleyball	6	2	7
Softball	0	2	3
Sport not reported	1	0	1
Winter²			
Basketball	4 ³	1 ³	6 ³
Sport not reported	3	1	0
Total	14	6	17

¹Fall sports (besides football): volleyball, softball, girl's golf, boy's tennis, and cross country.
²Winter sports (besides wrestling): boy's and girl's basketball and swimming.
³2008-09: 2 boys, 1 girl, 1 gender not reported. 2009-10: 1 boy. 2010-11: 4 boys, 1 girl, 1 gender not reported.



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DISCUSSION AND CONCLUSIONS

- ### Discussion
- Number of reported MRSA infections among participants of contact sports decreased substantially from 2008-09 to 2010-11
 - 2008-09 incidence of reported MRSA infections among football and wrestling participants was similar compared to previously established 2007-08 estimates
 - Estimated incidence then decreased steadily and substantially from 2008-09 to 2010-11
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Discussion

- Number of reported MRSA infections among participants of softball, volleyball, and basketball increased during 2010-11 when compared with numbers reported during preceding school years

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- ### Limitations
- Not able to verify the accuracy of diagnosis
 - Unable to establish rigorous case definition
 - Physician-diagnosed cases reported only
 - However, consistent method of case ascertainment used for all surveys
 - Surveying at immediate end of sport season would not capture cases with later onset
 - Reporting dependent on respondent recall
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Conclusions

- **Estimated incidence of physician-diagnosed MRSA infections among Nebraska high school football and wrestling participants decreased substantially during 2010–11 compared with previous school years**
- **The apparent increasing incidence in these contact sports demonstrated previously during 2007–08 has not continued**

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Conclusions

- **By maintaining updated contact information of at least one official in each Nebraska high school and communicating regularly, we have continued surveillance with high rates of participation to monitor MRSA incidence among athletes in contact sports over five consecutive school years**

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Recommendations

- **Surveillance to monitor MRSA incidence among Nebraska high school athletes in contact sports should be continued**
- **Surveillance should be enhanced to determine participation numbers in volleyball, softball, and basketball to establish and monitor incidence estimates among athletes in these non-contact sports**

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Thank-you

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
 Telephone: 1-800-CDC-INFO (232-4636) / TTY: 1-888-232-6348
 E-mail: cdcinfo@cdc.gov Web: <http://www.cdc.gov>

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