



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

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

5

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 Staphy (MRSA) Infections Among High School Athletes—Nebraska, 2006–2008. J Sch Nurs. 2009 Aug;25(4):282-91.

6

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

Previously Established Incidence Estimates* of Physician-Diagnosed MRSA Infections among Nebraska Athletes MRSA incidence per 10,000 participants Sport

Football

Wrestling

2006-07

5.0

19.6

2007-08

25.1

60.1

On-Going Activities	On-	Going	Activ	vities
----------------------------	-----	-------	-------	--------

- 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

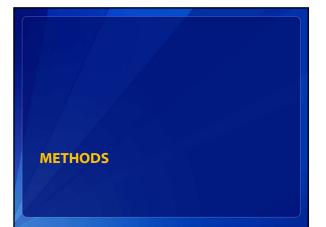


Surveillance Objectives

- 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

10

12



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

14

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

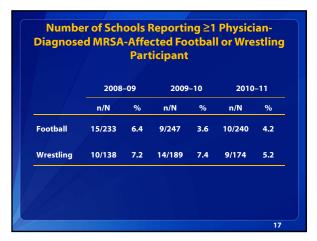
13

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



Progra	ms by School		Year and	d Spo	rt 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)	



20 13 10,511 11,309 11,518 Football (1) (1) (1) (31) (31) (33) 19.0 11.5 11.3 (1-2) (1-4) (1-3) (11-285) (9-255) (8-285) 16 17 9 2,631 3,398 3,205		м	RSA cas	ses		participa reported	nts			
20 13 13 10,511 11,309 11,518 Football (1) (1) (1) (31) (31) (33) 19.0 11.5 11.3 (1-2) (1-4) (1-3) (11-285) (9-255) (8-285) 16 17 9 2,631 3,398 3,205 11.5 11.5	Sport		ian per			ian per te				
Football (1) (1) (1) (31) (31) (33) 19.0 11.5 11. (1-2) (1-4) (1-3) (11-285) (9-255) (8-285) 16 17 9 2,631 3,398 3,205		08-09	09–10	10-11	08–09	09–10	10-11	08-09	09–10	10-1
	Football	(1)	(1)	(1)	(31)	(31)	(33)	19.0	11.5	11.3
(1–5) (1–2) (1) (1–76) (1–65) (2–60)	Wrestling	(1)	(1)	(1)	(16)	(15)	(15.5)	60.8	50.0	28.1

			Schoo	ol year		
Grade	200	8–09		9–10	201	0–11
Graue	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

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



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

22

24

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





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

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

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

Recommendations

25

27

- 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

Acknowledgments

- Nebraska Department of Health and Human Services
 Thomas J Safranek, MD, Nebraska State Epidemiologist
- Nebraska School Activities Association (NSAA)
 - James A Tenopir
- Jennifer Schwartz
- Thanks to all high school officials throughout Nebraska who have responded to the numerous survey requests and have thus made the success of this surveillance system possible. Also, thanks for continued commitment to ensure student athlete health.

28

26

