

Summary Report – Relating to a Pilot Program to Require Reporting of Methicillin-resistant *Staphylococcus aureus*

Prepared by the Texas Department of State Health Services pursuant to House Bill 1082 of the 80th Legislature

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Introduction

The 80th Legislature adopted HB 1082, which established a pilot program for reporting methicillin-resistant *Staphylococcus aureus* (MRSA) (see Appendix). HB 1082 also requires: 1) selection of a health authority to administer the program; 2) all clinical laboratories within the area served by the health authority to report all cases of MRSA; 3) the pilot program to track the prevalence of MRSA and study the cost and feasibility of adding MRSA to the reportable disease list; 4) collection of data regarding possible sources and prevention of MRSA; 5) recommendations by the health authority to the Texas Department of State Health Services (DSHS) regarding data collection, data management and analysis; and 6) the submission of a report concerning the effectiveness of the pilot program in tracking and reducing the number of MRSA infections in the affected area.

The 81st Legislature adopted HB 1362, which extended the pilot program and adjusted the due date to 2011. Because of the interest and participation of three local health authorities, DSHS is publishing this status report on the pilot project.

Staphylococcus aureus is a strain of bacteria that is a common cause of skin and soft tissue infections. Infections with this bacteria are often called “staph” infections. Staph skin infections generally start as small red bumps that resemble pimples, boils or spider bites. These red bumps can quickly turn into more serious infections such as boils, (a bump or swelling under the skin), folliculitis (infections of the hair follicles), impetigo (pus-filled blisters on the skin) and cellulitis (flat red skin infections). At times the words abscess and carbuncle are interchangeably used to describe boils and impetigo. Most of the time the bacteria remain confined to the skin. However, staph bacteria can also penetrate into the body, causing potentially life-threatening infections in the bloodstream, bones, joints and lungs.

Staph infections are treated with antibiotics. Pencillin and cephalosporins are frequently used. Some *Staphylococcus aureus* are resistant to a large group of antibiotics called the beta-lactams, which include methicillins, penicillins and the cephalosporins. *Staphylococcus aureus* with resistance to these beta-lactams are called methicillin-resistant *Staphylococcus aureus* (MRSA).

Staphylococcus aureus commonly colonizes in the nostrils, although the scalp, armpits and groin are also colonization sites. Colonization means that the staph bacteria are present on the body but are not causing illness. Healthy individuals may carry MRSA asymptotically for periods ranging from a few weeks to many years. Approximately 30% of the population is colonized with *S. aureus* at any given time. Only 1-2% of the population is colonized with methicillin-resistant *S. aureus*. This means 230,000 to 460,000 Texans may be colonized with MRSA. Persons colonized with staph can be a source of infections for themselves and for others.

MRSA is spread by direct skin-to-skin contact with a person who has an infection or who is colonized with MRSA. MRSA can be also spread by sharing contaminated items such as towel and clothing and by touching surfaces contaminated with MRSA. Persons at risk of infections include: 1) persons with weaken immune systems (people living with HIV/AIDS and cancer patients, for example); 2) persons with diabetes; 3) persons participating in contact sports; 4)

persons staying in a health care facility for an extended period of time; and 5) persons with a history of jail or prison incarceration.

The most effective means of controlling the spread of MRSA include: 1) keeping infected areas covered; 2) washing hands; 3) avoiding contact with other persons with MRSA infections; 4) washing clothes and linens contaminated with MRSA; and 5) avoiding sharing personal items such as towels.

A recent report estimated that the number of patients hospitalized with a MRSA infections in the United States ranged from approximately 127,000 in 1999 to over 278,000 in 2005 (1). The number of MRSA-related deaths was estimated to average 5,500 per year.

Few studies have estimated the occurrence of MRSA infections in a specific city or county. A study performed in San Francisco, California estimated the annual occurrence of MRSA infections to be 532 infections per 100,000 population or about 5 infections annually for every 1,000 people (2). Other studies in various city, counties or states have reported from 274 to 1,667 infections annually per 100,000 population (3). These findings are shown in Table 1.

Methodology

To identify public health authorities interested in participating in the program, DSHS consulted with the Texas Association of Local Health Officials (TALHO). More than 12 local health authorities expressed interest in participating in the pilot program.

Three local health authorities were selected to participate in the pilot program: Amarillo Bi-City-County Health District, Brazos County Health Department and the San Antonio Metropolitan Health District. These three counties were selected to provide variations in geographic location, population size and population characteristics in the areas under study.

Staff from the three health departments participated in conference calls and other discussions on implementation of the pilot program, development of rules for methicillin-resistant *Staphylococcus aureus* (MRSA) reporting and development of a case reporting form. The Appendix includes a copy of the rules and the investigation form. Demographic information, information on the MRSA culture, and risk factor information was collected. A common Microsoft Access database was used to manage the information collected from each patient.

Clinical and hospital laboratories within the three local health authorities were required to report all positive (MRSA) cultures from specimens collected from March 1, 2009 through March 31, 2009. Staff at the local health authorities reviewed hospital and/or laboratory records to identify patients with physical addresses within the health authorities' jurisdictions (Bexar, Brazos, Potter and Randall counties). Interviews were attempted only on those patients residing within the health authorities' jurisdictions.

Results

A total of 775 persons with methicillin-resistant *Staphylococcus aureus* (MRSA) infections were reported from the three areas. The number of reported infections ranged from 67 in Brazos County to 613 in Bexar County. Table 2 shows the number of reported MRSA infections by county, the projected annual number of cases and the projected annual incidence rate. The projected annually incidence rates are very similar ranging from 470 to 482 cases per 100,000 population.

Table 3 shows the number of cases by county and age group. Persons with MRSA infections ranged in age from one month to 100 years. Half were 40 years of age or older. Only 2 percent of the persons were less than one year of age, while 22 percent were 60 years of age or older. Overall, a slight majority (56%) of the persons with reported infections were males. A majority (86%) of persons with reported infections were white. Ten percent were African-American. Hispanics represented 29 percent of the persons with infections reporting white race.

Most of the persons with infections (77%) had wound, soft tissue or skin infections. The body site or source of the clinical specimen that grew methicillin-resistant *Staphylococcus aureus* is shown in Table 4. The body site or source was reported for 600 of the 775 patients. Wounds, abscesses or sores on the leg or hips were the most frequent (18.8%) site followed by wounds on the buttocks (11.3%). Small percentages of persons had MRSA isolated from a respiratory tract source (9.5%), blood (5.3%) or urine (5.0%). These persons had respiratory, bloodstream or urinary tract infections, respectively, caused by MRSA.

Interviews were completed for 186 of the 775 (24%) persons with MRSA infections. Risk factors for MRSA infections for these persons are summarized in Table 5. Hospitalization within the past 12 months was the most frequent (22.6%) reported risk factor followed by a history of surgery within the past 12 months (18.8%). Twenty-four persons (12.9%) reported contact with someone also experiencing a MRSA infection. Nineteen persons (10.2%) reported a previous MRSA infection prior to the current MRSA infection. Persons in 13 households reported having a household member with a current MRSA infection.

Some persons had multiple MRSA risk factors. Thirty persons reported a history of hospitalization and surgery within the past 12 months. Ten persons reported hospitalization, surgery and residing in a long-term care facility with the past 12 months. Nine persons reported a previous MRSA infection and hospitalization or surgery with the past 12 months.

Discussion

The pilot program provided information that the incidence of MRSA infections in the three Texas communities is similar to other geographic locations throughout the United States. Annual incidence of MRSA infections in the three Texas communities ranged from 470 to 482 infections per 100,000 population. These incidence rates are within the range of MRSA incidence rates reported in other communities throughout the United States. Extrapolating the incidence rates in the Texas communities to the Texas population, an estimated 100,000 to 112,000 MRSA infections may occur annually in Texas.

Staff from the three local health authorities reported the following to the Texas Department of State Health Services:

- 1) Collecting MRSA culture reports from clinical laboratories during March 2009 was laborious for local health department staff.
- 2) Disease surveillance and control activities for other reportable condition were diminished due to the burden of MRSA reporting.
- 3) Culture reports from laboratories frequently lacked pertinent patient information such as patient address and telephone number necessitating follow-up calls to the clinical laboratories, hospitals or patient's physician office.
- 4) Attempting to interview persons with MRSA infections was difficult, requiring multiple telephone calls.
- 5) Persons with MRSA infections frequently declined interviews for the collection of risk factor information.
- 6) Laboratories within the areas expressed unwillingness to report MRSA cultures, citing competing priorities and costs
- 7) Clinical reference laboratories located outside the areas that tested specimens from area residents did not report.
- 8) Requiring MRSA reporting may have influenced culturing practices by physicians.
- 9) Some clinical laboratories decided not to comply with MRSA reporting because of the "unfunded" cost.
- 10) Local health authority staff have little or no resources for reducing the number of MRSA infections with the community.

With potentially over 100,000 reports annually, adding MRSA infections to the reportable disease list would create challenges for local and regional health departments and the Texas Department of State Health Services to implement and sustain reporting. In addition, clinical and hospital laboratories may not have the capabilities and resources to report each person diagnosed with a MRSA infection. Without sufficient financial support for the clinical laboratories, hospitals and the local and regional health departments, it is unlikely these entities would be capable of conducting and sustaining activities related to MRSA surveillance and reporting.

References

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Table 1. Reported or estimated annual incidence rates by geographic locations in the United States.

Location	Time period of study	Number of identified infections	Annual incidence rate per 100,000 population	Reference
San Francisco, CA	2004-2005	3,826	532	2
Portland, OR	2005	4,357	290	3
Baltimore, MD	2005	10,600	1,667	3
Ramsey, MN	2005	1,357	274	3
Connecticut	2005	13,600	389	3

Table 2. Number of reported MRSA infections during March 2009 and projected annual number and incidence rates, Bexar, Brazos, Potter and Randall Counties, Texas.

Location	Number of reported MRSA infections during March 2009	Projected annual number of MRSA infections	Projected annual incidence rate per 100,000 population
Bexar County	613	7,344	470
Brazos County	67	804	482
Potter/Randall Counties	95	1,104	480

Table 3. Number of reported MRSA infections during March 2009 by county and age group.

Age group (in years)	Bexar County	Brazos County	Potter & Randall counties	Total
Less than 1	15	0	0	15
1-4 yrs	59	5	11	75
5-9 yrs	26	1	4	31
10-19	55	7	12	74
20-29	80	17	11	108
30-39	62	7	12	81
40-49	90	9	12	111
50-59	85	10	11	106
60-69	55	7	7	69
70 and older	85	4	15	104
Unk	1	0	0	1
Total	613	67	95	775

Table 4. Body site or source of clinical specimen for MRSA infections.

Body site or source	Number	Percentage
Leg or hip	113	18.8
Buttocks	68	11.3
Face, head or neck	59	9.8
Respiratory	57	9.5
Trunk	52	8.7
Arm	43	7.2
Foot	37	6.2
Blood	32	5.3
Urine	30	5.0
Hand	23	3.8
Genital	16	2.7
Axillary or armpit	16	2.7
Other*	15	2.5
Back	15	2.5
Groin	11	1.8
Bone	7	1.2
Eye	6	1.0
Total	600	100

*Includes stool, lymph node, synovial fluid and cerebral spinal fluid

Table 5. Risk factors presence within the 12 months prior to the MRSA infection occurring in March 2009.

Risk factor	Number	Percentage
Being a hospital inpatient	42	22.6
Having prior surgery	35	18.8
Contact with someone with a MRSA infection	24	12.9
Working out in an athletic club or gym	23	12.4
Previous MRSA infection	19	10.2
Being a healthcare worker (HCW) or household member is a HCW	14	7.5
Having a household member with a current MRSA infection	13	7.0
Being a resident of a long-term care facility	12	6.5
Participating in team sports	9	4.8
Incarceration in a jail or prison	4	2.2
Receiving a new tattoo	4	2.2