

# Epidemiology and Antibiotic Prescribing Trends of Community Acquired Staphylococcal Skin and Soft Tissue Infections at a Tertiary Care Children's Hospital

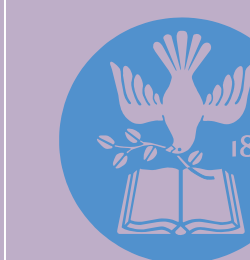
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## ABSTRACT

**Background:** *Staphylococcus aureus* (SA) is the most frequent cause of skin and soft tissue infections (SSTI). Methicillin resistant *Staphylococcus aureus* (MRSA) infections have increased in most geographic areas of the United States. Antibiotic use in these communities may be associated with changes in the epidemiology of these infections.

**Methods:** The epidemiologic pattern of SA-SSTI, antibiotic prescribing patterns and treatment modalities at our pediatric institution were examined. A retrospective chart review by diagnosis and billing codes of all SSTI in children 0 to 18 years of age from January 2005 through December 2009 was performed. Patient demographics, length of hospital stay (LOS) if admitted, microbiologic information, and antibiotics prescribed were collected. Poisson regression model was used to evaluate the significance of changes over time.

**Results:** 2,411 children were screened; complete information and diagnosis were available for 553 subjects (23%). The annual number of proven of SA -SSTI increased steadily from 52 cases in 2005, to a peak of 174 cases in 2008 ( $p < 0.001$ ). The proportion of cases attributable to MRSA increased steadily to a peak of 72% of cases in 2009. The highest incidence occurred in teenagers aged >14 years (32%), and in toddlers ages 2-5 years (26%). Seasonality was demonstrated by peak incidence in summer months every year of the study. LOS decreased by 0.2 days per year over the study period ( $p < 0.001$ ). Clindamycin susceptibility of pediatric isolates in this study was higher than the predicted susceptibility using our hospital antibiograms (See Figure). Initial antibiotic prescribing showed coverage for only MSSA 60% of the time at the beginning of the study, with a significant trend toward empirical coverage for MRSA in greater than 80% of cases over time ( $p < 0.001$ ).

**Conclusions:** MRSA SSTI in pediatric patients increased in our community over the study period. A concomitant rise in use of antibiotics appropriate for MRSA was seen. Clindamycin susceptibility in all SA fluctuated during the study. Provider education about the trends of antibiotic resistance should be continually provided to enhance appropriate antibiotic use.

## BACKGROUND

- First reported as a childhood community pathogen in the late 1990's

- MRSA seems to produce more invasive disease and deep soft tissue infection

- MRSA incidence in communities was increasing

- IDSA published guidelines on the management of MRSA SSTI's, revised 2012

## OBJECTIVES



- Determine the annual number of cases of staphylococcal skin and soft tissue infections in children in Springfield, MA

- Follow susceptibility patterns over time

- Describe antibiotic prescribing trends for pediatric SSTI over time

## METHODS

### Retrospective chart review of all SSTI's

#### Inclusion:

Children age 0-18 yrs  
Billing codes for SSTI:

#### Exclusions:

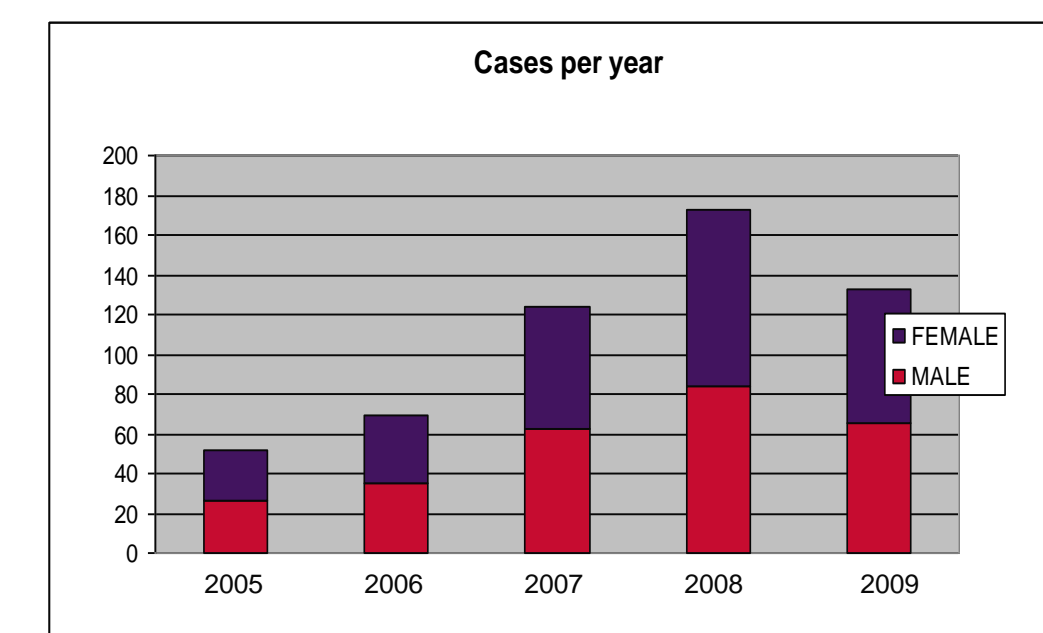
No culture data available  
Prior hospitalization within the year  
Prior abscess already recorded in study period  
Evidence of frequent hospital care, invasive devices, or HAI (G -tube, Trach..)

#### Data collected:

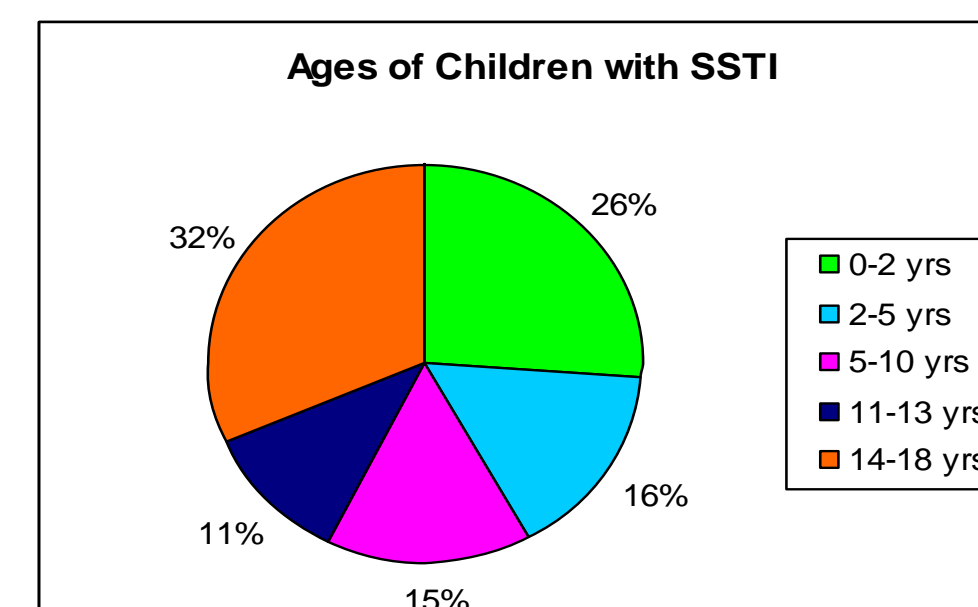
- Age, race, zip code
- Month of presentation
- Location of initial evaluation and culture
- Location of abscess – 2008 and 2009 only
- Length of hospital stay
- Bacteria and susceptibility
- Antibiotic use

Statistical analysis: Poisson regression model was used to evaluate the significance of changes over time.

Year	Screened	Included	Percent Included
2005	416	52	12%
2006	483	70	14%
2007	509	124	24%
2008	436	174	40%
2009	567	133	23%
Totals	2411	553	23%

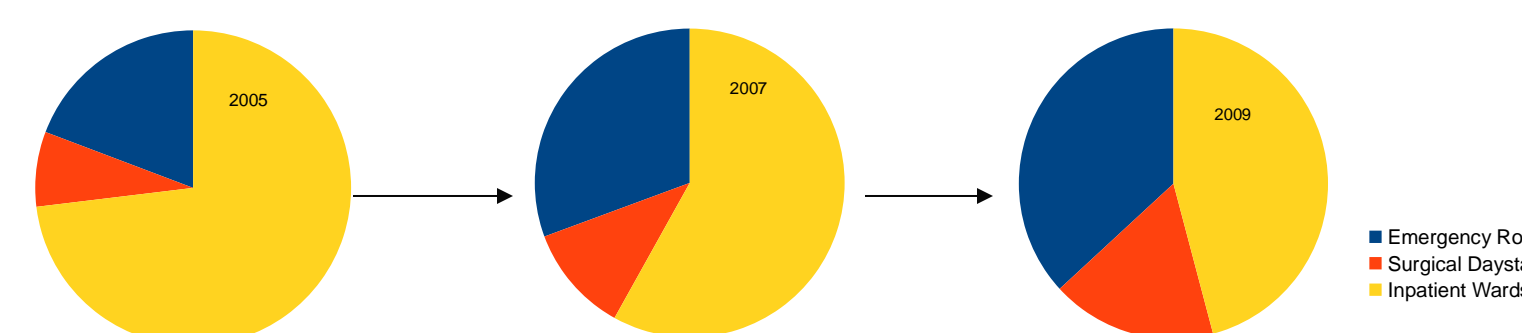


Annual cases of culture positive SSTI



### Anatomic location of lesions by age

- Patients under 5 yrs old 60% -groin and buttock
- Patients over 5 yrs old 66% -arm, head, lower leg

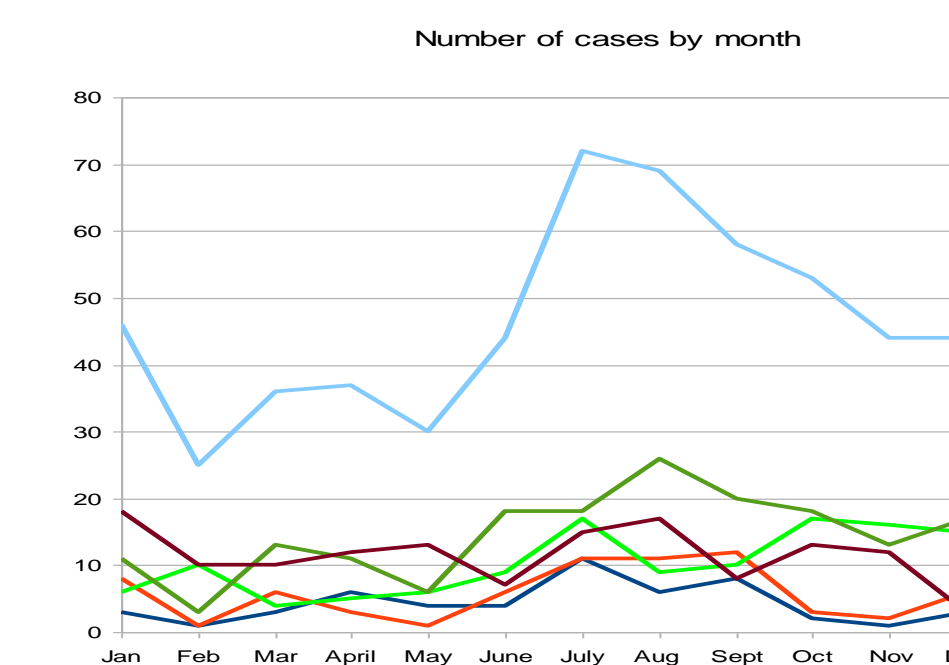


Location of hospital management

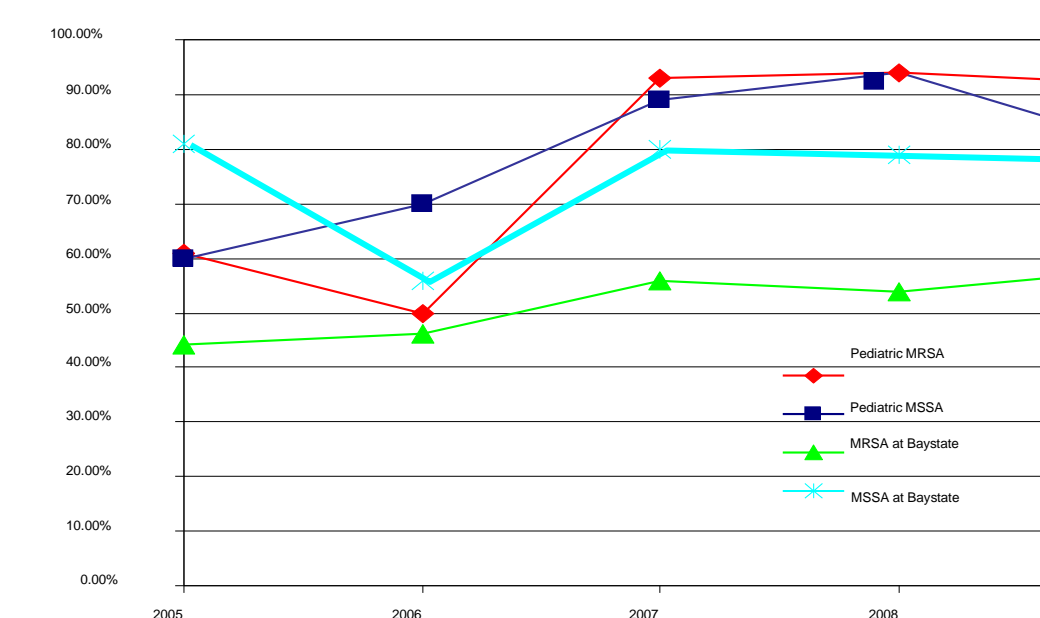
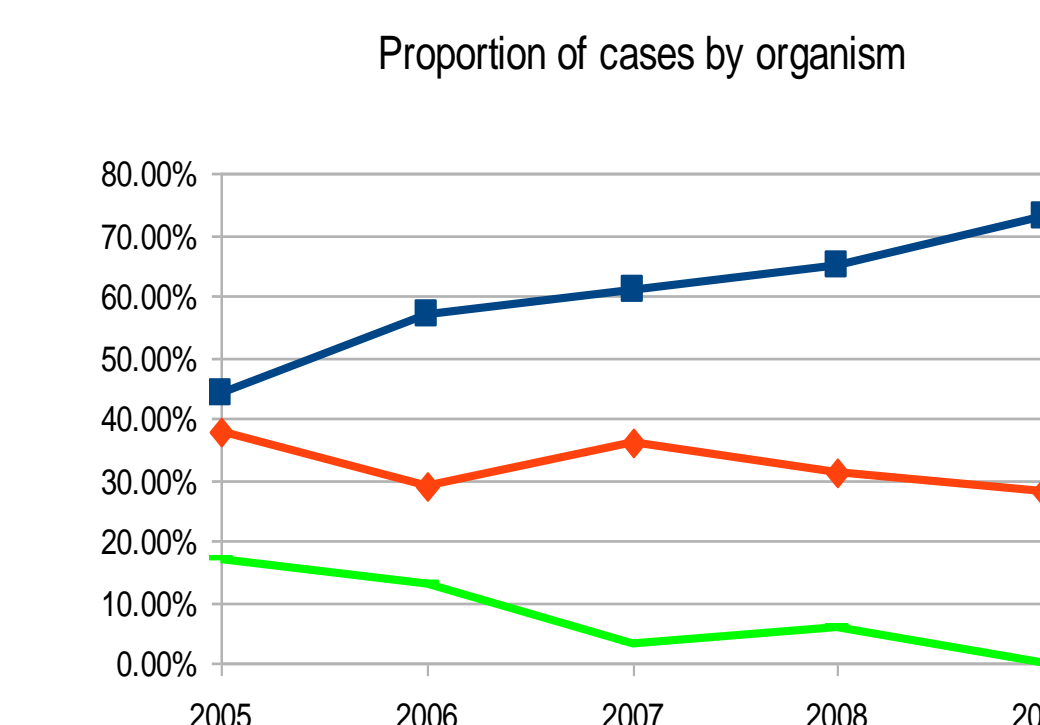
Year	Total Inpatient Days	Average Length of Stay in Days*
2005	97	2.55
2006	120	2.35
2007	170	2.24
2008	127	2.01
2009	106	1.73

\* LOS decreased by 0.2 days per year over the study period ( $p < 0.001$ )

## RESULTS



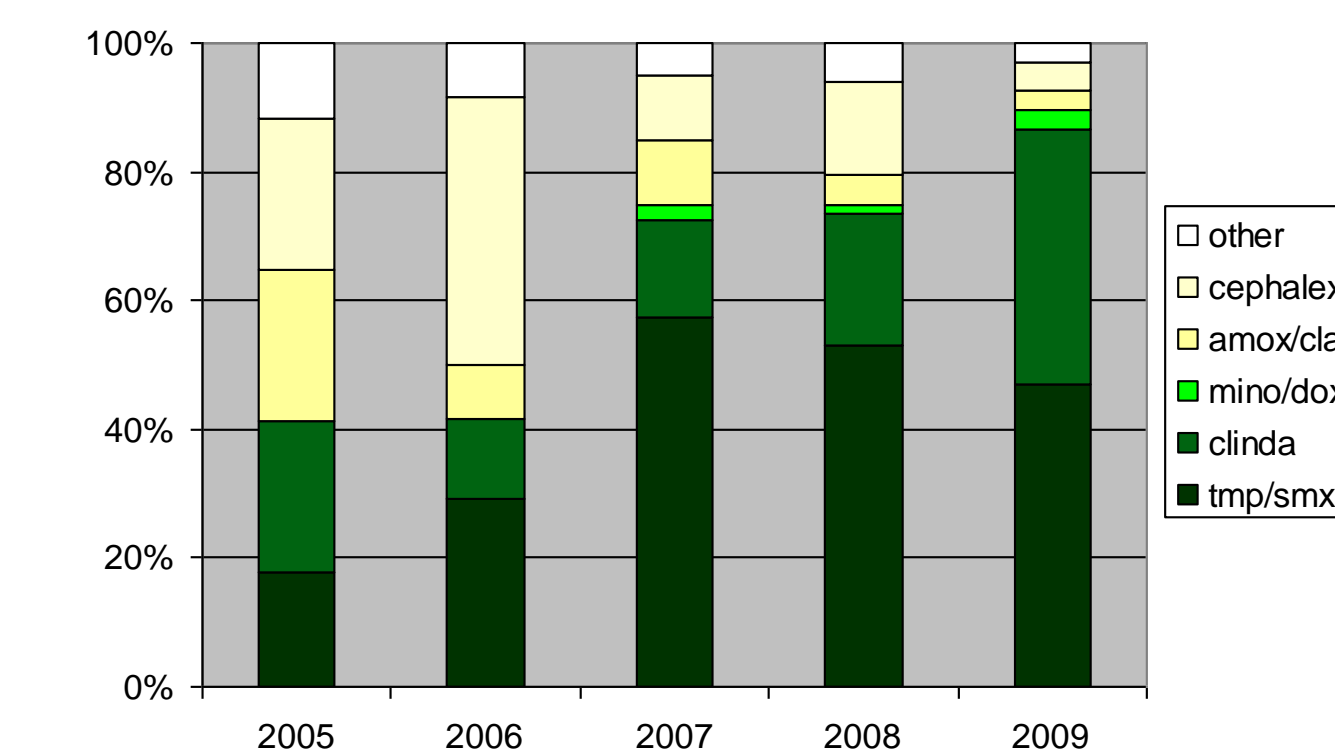
Peak seen in summer and a second peak in winter



Clindamycin susceptibility (D-test) of pediatric isolates differed from the general hospital antibiogram and fluctuated over time

What are community pediatricians prescribing?

### Antibiotic Prescribing



Change over time prescribing MRSA coverage ( $p < 0.001$ )

## CONCLUSIONS

- Skin and soft tissue infections are common in pediatric patients and the majority are due to *Staph. aureus*. MRSA is the predominant pathogen isolated

- Seasonality occurs and infections are more frequent in summer.

- The prescribing community has changed its prescribing habits over time.

- Clindamycin susceptibility of MSSA and MRSA are changing over time and are different in our pediatric population than in the entire hospital population. Specific age-related antibiograms are helpful to track trends in susceptibility patterns.

- Hospitalization is becoming less frequent and stays are becoming shorter. This is primarily an outpatient disease.

## REFERENCES

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