

# ARLG

Antibacterial Resistance Lead

## Antibacterial Resistance Leadership Group (ARLG)

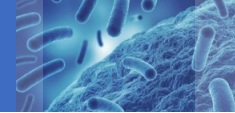
### Emerging *S. aureus* Antimicrobial Resistance and Current Prescribing Practices for Patients Presenting to US Emergency Departments with a Purulent Skin and Soft Tissue Infection

1/17/2023

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# Disclosures

- ARLG EVERYONE grant

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- EMERGENCY IDNET

- Grant number: U01CK000643

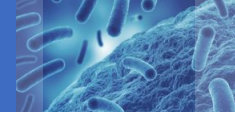
- No conflicts of interest



## Background

- Purulent Skin and soft tissue infections (SSTIs)
  - 5.4 million to 8.4 million ED/clinic visits in 2015<sup>1</sup>





# Background

- CA-MRSA emergence<sup>1</sup>
  - 17% MSSA
  - **59% MRSA**
  - 97% USA300

- CA-MRSA antibiotic sensitivity
  - 95% Clindamycin
  - 92% Tetracycline
  - **100% Trimethoprim-sulfamethoxazole**

The NEW ENGLAND JOURNAL of MEDICINE

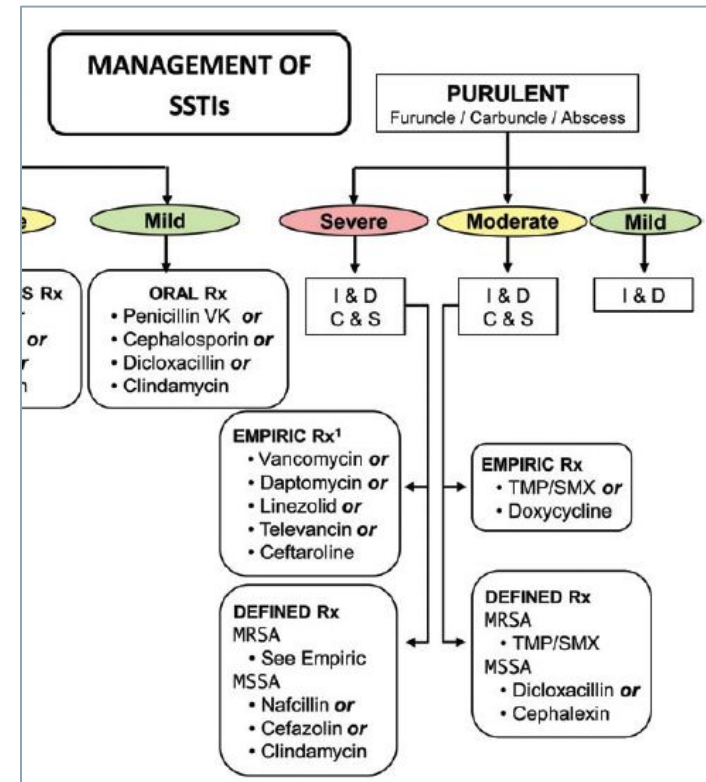
ORIGINAL ARTICLE

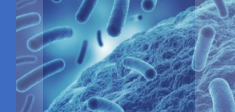
## Methicillin-Resistant *S. aureus* Infections among Patients in the Emergency Department

Gregory J. Moran, M.D., Anusha Krishnadasan, Ph.D.,  
Rachel J. Gorwitz, M.D., M.P.H., Gregory E. Fosheim, M.P.H.,  
Linda K. McDougal, M.S., Roberta B. Carey, Ph.D., and David A. Talan, M.D.,  
for the EMERGENCY ID Net Study Group\*

# Background

- 2014 IDSA SSTI Guideline<sup>3</sup>
  - TMP/SMX or Doxycycline
  
- National Survey 2016<sup>4</sup>
  - 7.5 Million TMP/SMX
  - 4.5 Million Tetracyclines
  - 3.3 Million Clindamycin

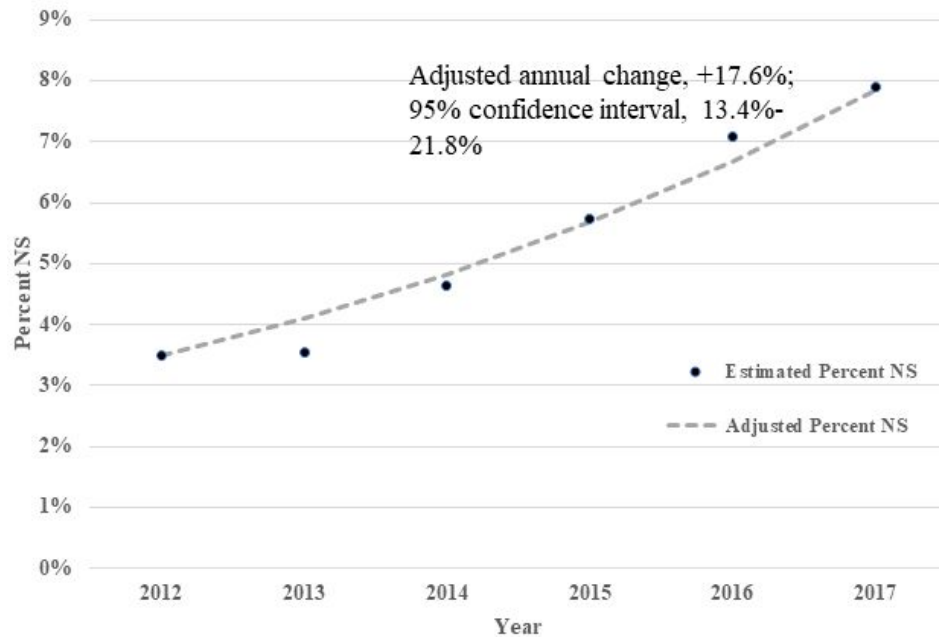




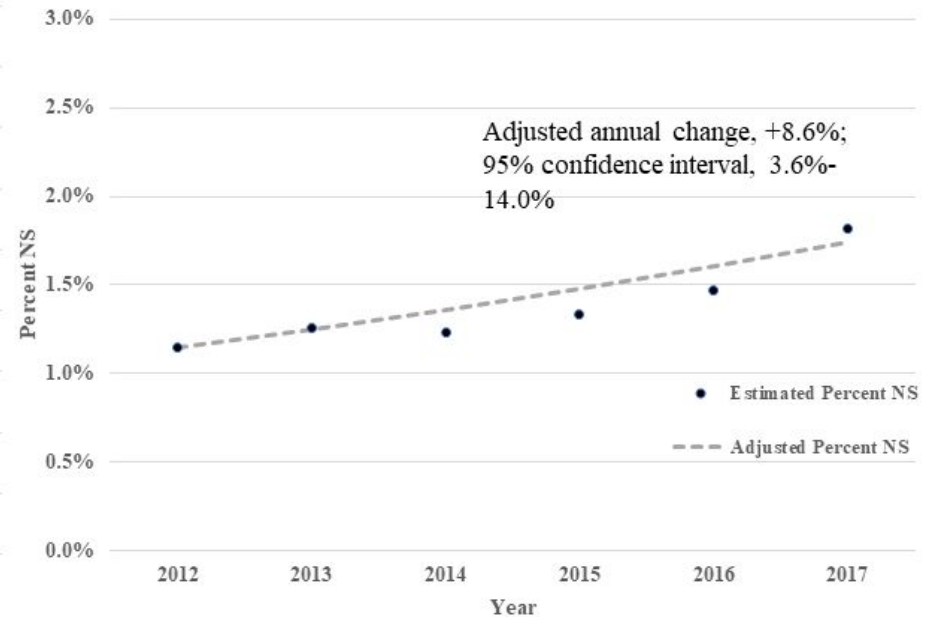
# Background: Emergence of resistance?

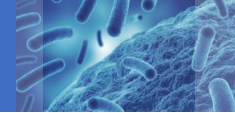
- National Database Analysis<sup>5</sup>
  - MRSA and MSSA TMP/SMX resistance

(A) MRSA



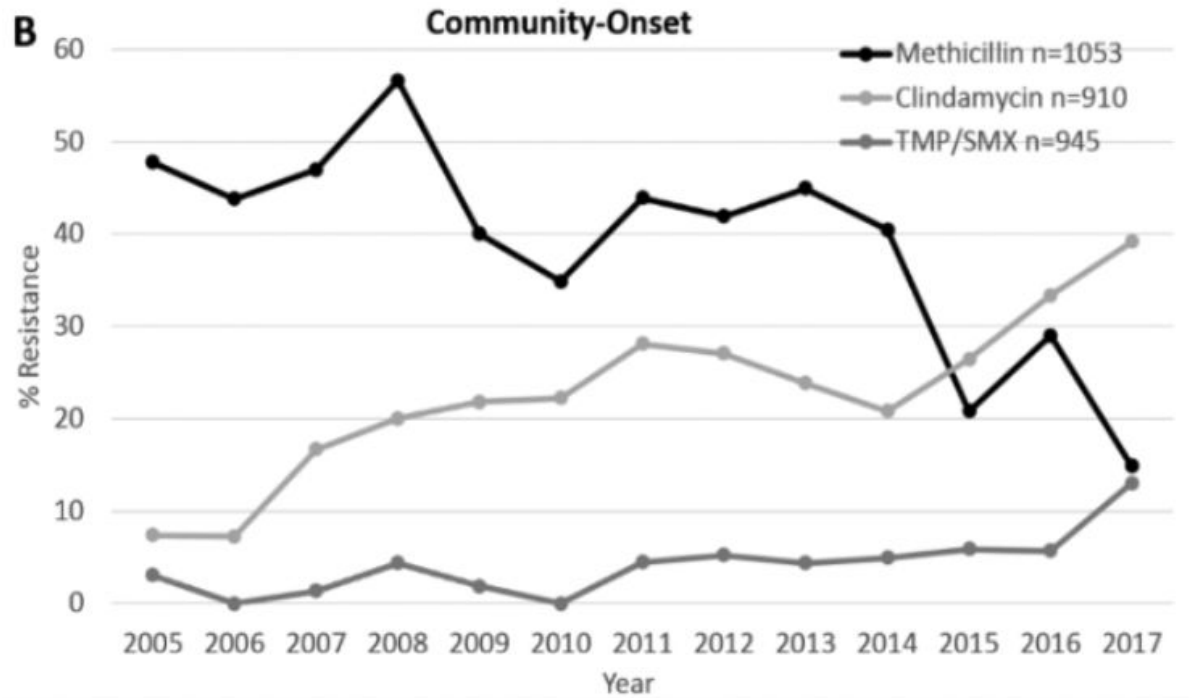
(B) MSSA



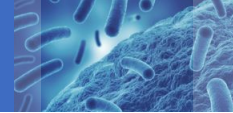


# Background: Emergence of resistance?

- Pediatric population 2005-2017<sup>6</sup>
  - TMP/SMX resistance 2% to 13%

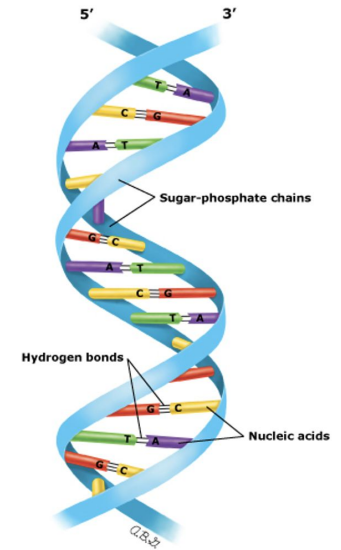




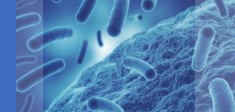


# Background: Changing epidemiology?

- 2006 – MRSA isolates: USA300 (CC8)
- 2022 –TMP/SMX resistance genes: CC398







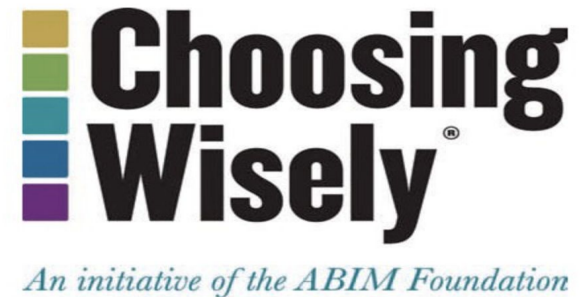
# Background: Changing epidemiology?




## ACEP Joins Choosing Wisely Campaign

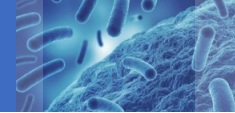
By ACEP Now | on November 1, 2013 | 0 Comment

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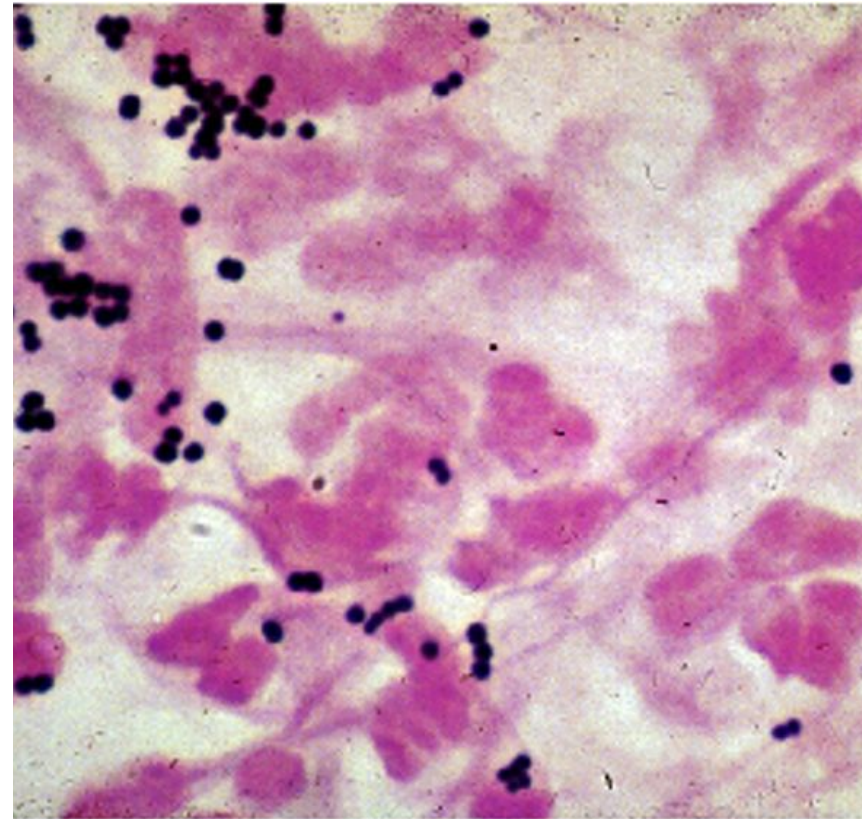
### CHOOSING WISELY RECOMMENDATIONS

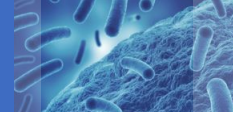
Avoid antibiotics and ~~wound cultures~~ in emergency department patients with uncomplicated skin and soft tissue abscesses after successful incision and drainage and with adequate medical follow-up. 



# Objectives

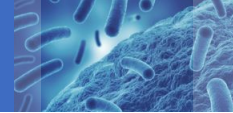
- Primary Objective
  - MRSA and MSSA resistance to
    - TMP/SMX
    - Tetracycline
    - Clindamycin





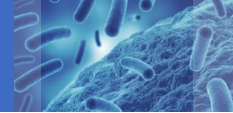
# Objectives

- Secondary Objectives
  - MRSA and MSSA prevalence
  - Risk factors for TMP/SMX *S. aureus* resistance
  - Frequency of culture and sensitivity testing
  - Types of antibiotics prescribed
  - Genetic typing of a subset of TMP/SMX resistant samples



# Methods

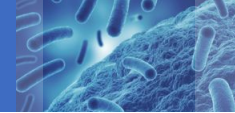
- Prospective, multicenter, observational
  
- **Inclusion Criteria**
  - Any age
  - Purulent SSTI  $\leq 7$  days
    - Skin abscess
    - Infected wounds



# Methods

## ▪ Exclusion Criteria

- Perirectal abscesses
- Mammalian bites
- Suspected osteomyelitis or septic arthritis
- Unable to provide consent
- Psychiatric holds
- Prisoners



# Methods: Sites

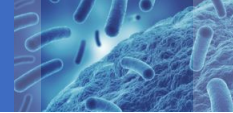


**EMERGENCY ID NET**

*An emerging infectious disease sentinel network*

## ■ Sites

- Brigham and Women's Hospital
- Hennepin County Medical Center
- Johns Hopkins Medical Center
- Lewis Katz School of Medicine at Temple University
- Valleywise Medical Center
- Oregon Health Sciences University
- University of Iowa
- University of New Mexico Health Sciences Center
- University of Mississippi Medical Center
- University of Missouri-Kansas City
- Olive View-UCLA Medical Center
- Ronald Reagan UCLA Medical Center



# Methods

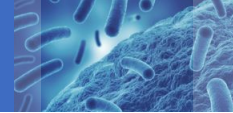
- Sample size: 437
- 6-month enrollment period
  - May to October 2024
- Follow up
  - 1 Month follow up telephone call

## Baseline/Enrollment Form (BEF)

### Clinician questions:

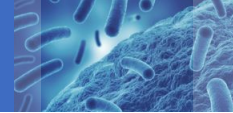
1. Type of purulent skin and soft tissue infection:
  - Skin abscess (If more than one abscess, how many present: \_\_\_\_\_)
  - Infected wound
  - Purulent cellulitis
  - Surgical site infection
2. Duration of symptoms (circle number of days): 1 2 3 4 5 6 7
3. Is there tenderness to palpation of SSTI?  Yes  No
4. Is there swelling associated with the SSTI?  Yes  No
5. From the largest lesion, estimate the maximal width and length of:
  - 5a. Erythema: Width \_\_\_\_\_ cm Length \_\_\_\_\_ cm
  - 5b. Induration: Width \_\_\_\_\_ cm Length \_\_\_\_\_ cm
  - 5c. Fluctuance: Width \_\_\_\_\_ cm Length \_\_\_\_\_ cm





# Methods: Lab

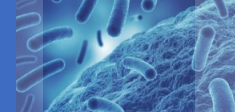
- Would Cultures
  - Central Laboratory
    - Cultures and Sensitivity
    - Genetic typing of a subset of TMP/SMX resistant



# Future

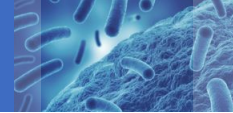
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- Inform current clinical practice
- Glimpse of the circulating variants



# Citations

1. Fritz S, Shapiro DJ, Hersh A. National trends in incidence of purulent skin and soft tissue infections in patients presenting to ambulatory and emergency department settings, 2000–2015. *Clin Infect Dis*. 2020;70:2715-8.
2. Moran GJ, Krishnadasan A, Gorwitz RJ, et al. EMERGENCY ID Net Study Group. Methicillin-resistant *S. aureus* infections among patients in the emergency department. *N Engl J Med*. 2006;355:666-74.
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6. Khamash DF, Voskertchian A, Tamma PD, et al. Increasing clindamycin and trimethoprim-sulfamethoxazole resistance in pediatric *Staphylococcus aureus* infections. *J Pediatric Infect Dis Soc*. 2019;8:351-3.
- Slides 3 & 10 pictures form uptodate



# The Team!

Special thanks to my mentors:

Dr. David Talan

Dr. Gregory Moran

Dr. Anusha Krishnadasan



**EMERGENCY ID NET**  
*An emerging infectious disease sentinel network*



# Questions

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Thank you!



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