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Swine Farming and MRSA

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- Co-director, Center for Emerging Infectious Diseases
- Bachelor’s in biology, Yale University
- PhD in microbial pathogenesis, University of Toledo
- Post-doctoral training in molecular epidemiology, University of Michigan
- Current research investigates the epidemiology of antibiotic-resistant *Staphylococcus aureus* in rural and farming exposures
- Has written books on Ebola, Group A streptococcus, and Group B streptococcus
We’ll be discussing some work we’ve done looking at swine farming and methicillin-resistant *Staphylococcus aureus*

Iowa is the No. 1 pig-producing state (there are about six-times more pigs than humans in Iowa)

We’ll look at swine farming as a potential reservoir of MRSA bacteria in the state
Section A

Introduction to MRSA
Introduction to MRSA

- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Gram-positive bacterium
- Leading cause of hospital-associated infections

Source: CDC
Introduction to MRSA

- Approximately 30 percent of the population carries a strain of *S. aureus*

- About 1.5 percent are colonized with MRSA

- There were 18,000 deaths and 94,000 invasive infections from MRSA in 2005

Introduction to MRSA

- Not only a hospital problem anymore

- Now throughout community
  - Schools
  - Prisons
  - General population
Introduction to MRSA

Introduction to MRSA

7th-grader's death sparks parents' superbug concerns

Methicillin-Resistant *Staphylococcus aureus* in a Family and Its Pet Cat

**TO THE EDITOR:** Many isolates of community-acquired methicillin-resistant *Staphylococcus aureus* (MRSA) produce Panton–Valentine leukocidin (PVL), increasing the virulence of the bacteria, which makes them resistant to antibiotics. In this case, although the patient’s husband and children became MRSA-negative, the patient remained MRSA-positive. Therefore, her three apparently healthy cats were screened. Pharyngeal culture from one cat grew MRSA with the same MRSA epidemic resistance.

Introduction to MRSA

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MRSA and Swine

- First identified in the Netherlands, 2005
- Girl of 6 months found to have MRSA upon hospital admission
- Family lived on pig farm
- Parents also colonized

MRSA and Swine

- Twenty-six pig farmers swabbed; six (23%) tested positive for MRSA
  - A rate 760-times higher than in the general population

- Pigs cultured

- Same strain in pig and family (“ST398” or “non-typeable” MRSA)
Swine-associated MRSA also found in Denmark, Germany, Austria, France, Canada, Spain, Italy, Belgium, Sweden, Dominican Republic, China, Malaysia, UK, Switzerland, Portugal, Finland