Clustering MRSA in Europe indicates diffusion through regional health-care networks

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A new study finds that methicillin-resistant *Staphylococcus aureus* (MRSA) -responsible for several difficult-to-treat infections including blood poisoning and pneumonia and a particular problem in hospitals - occurs in distinct geographical clusters across Europe, indicating that MRSA is being diffused by patients moving between hospitals rather than spreading freely in the community.

The study, published in this week's PLoS Medicine, used an interactive Web tool to map different strains of the Staphylococcus aureus (*S. aureus*) bacterium across the continent.

MRSA infections have become more prevalent in hospitals over the past ten years, and information about its geographical distribution could help us to understand how it spreads and how to control it. In 2006 Hajo Grundmann, of the University Medical Centre in Groningen in the Netherlands, and colleagues assembled a large group of collaborators in 450 European hospitals located in 26 different countries. These hospitals collected both MRSA and methicillin-sensitive *S. aureus* (MSSA) isolates from infected patients - MRSA emerges when MSSA clones acquire resistance to antibiotics.

National laboratories identified specific strains of *S. aureus* by molecular typing and entered this information into a Web-based mapping application which is publicly available

(http://www.spatialepidemiology.net/srl-maps).

The results show that strains of MRSA tend to cluster within regional borders and, in several instances, were associated with individual hospitals. This suggests that MRSA is mainly spread by patients who are repeatedly admitted to different hospitals. "Control efforts aimed at interrupting the spread within and between health care institutions may not only be feasible but ultimately successful", conclude the researchers.

Franklin Lowy of Columbia University - uninvolved in the research - discusses the study in a Perspective and suggests that it "illustrates the ability of spatial mapping techniques to help understand the spread of new or re-emerging pathogens at the local as well as the international level"

Grundmann H, Aanensen DM, van den Wijngaard CC, Spratt BG, Harmsen D, et al. (2010) Geographic Distribution of Staphylococcus aureus Causing Invasive Infections in Europe: A Molecular-Epidemiological Analysis. PLoS Med 7(1): e1000215. doi:10.1371/journal.pmed.1000215

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