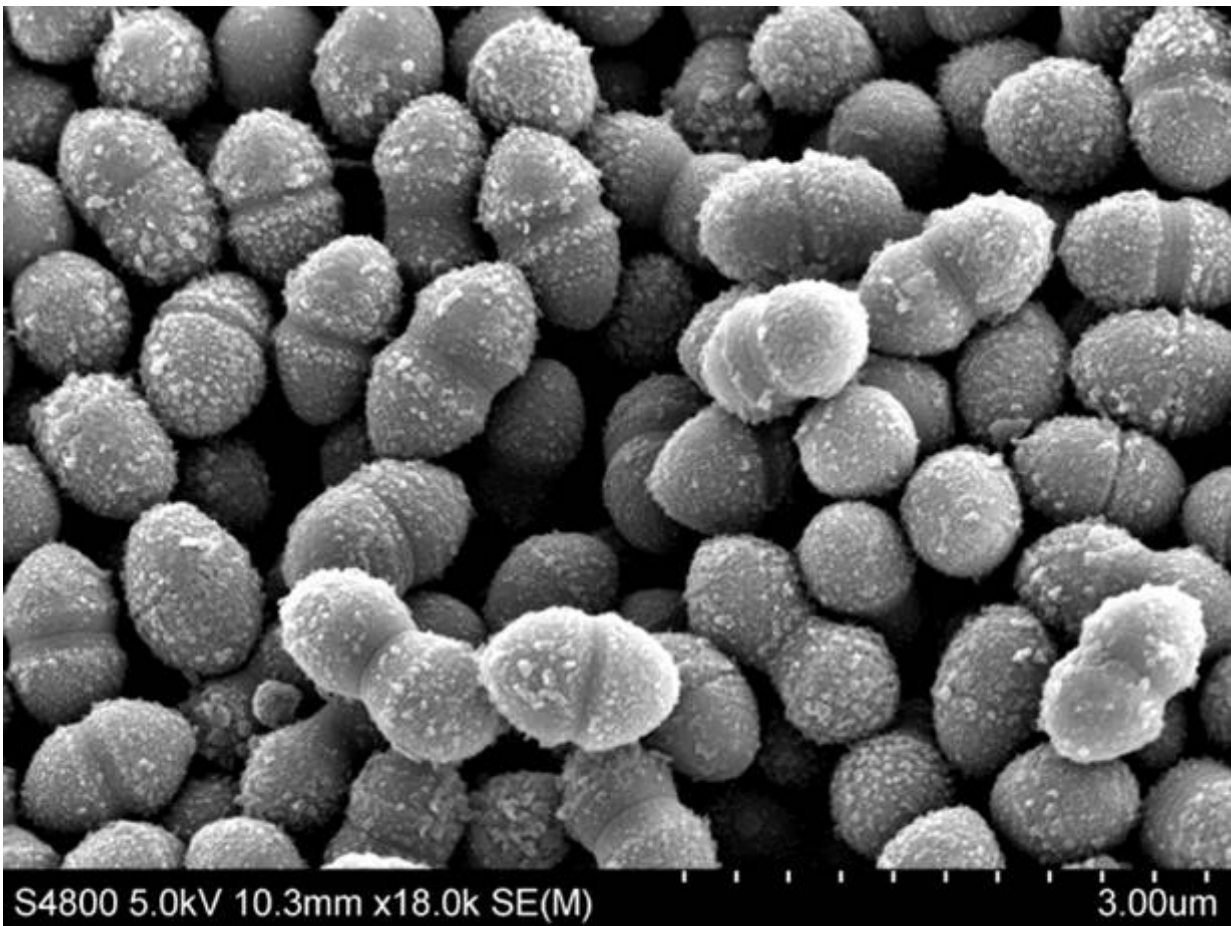


Scientists find new variant of streptococcal bacteria causing severe infections

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Streptococcus under the microscope. Credit: Nicola N Lynskey, Imperial College London/David Goulding, Wellcome Trust Sanger Institute

Scientists have discovered a new variant of streptococcal bacteria that has contributed to a rise in disease cases in the UK over the last 17 years.

Group A [streptococcus](#) causes around 600 million infections per year worldwide. Severe infections can cause necrotising fasciitis, pneumonia, sepsis, or toxic shock, and around one in four people who suffer an invasive infection do not survive.

Researchers at Imperial College London and clinicians at Imperial College Healthcare NHS Trust, together with colleagues at Public Health England, noticed a sharp rise in infections caused by one particular strain, called emm89, from 1998 to 2009. To investigate why, they sequenced the genomes of bacterial samples from patients.

The genetic sequences revealed a new subtype of emm89 streptococcus whose emergence coincided with the surge in cases.

Japan, Canada, France and Sweden have reported a surge in the same strain type, raising the possibility that the new variant is spreading globally.

The study, published in the journal mBio, was funded by the NIHR Imperial Biomedical Research Centre and the UK Clinical Research Collaboration.

Group A streptococcus can infect the skin or the throat, where it can cause tonsillitis. Less commonly, it infects deeper parts of the body, where it is much more dangerous. There are around 1300 to 1800 of these [invasive infections](#) each year in England, Wales and Northern Ireland, and health experts are increasingly concerned about periodic upsurges in both non-invasive and invasive diseases caused by group A strep.

The new variant has evolved two important differences from other members of the strain: it produces more toxin, and has completely lost its outer capsule.

"The fact that it had lost its capsule was a complete surprise, because it was believed that the capsule was essential for group A streptococcus to cause invasive disease," said Dr Claire Turner, a Junior Research Fellow at Imperial College London who led the study.

The researchers are still uncertain about why the new variant without capsule has become so dominant. "We know that without capsule, they stick better to surfaces, so that may help them to transmit more easily. Another possibility is that they can more easily get inside human cells, which makes them harder to treat," said Dr Turner.

Professor Shiranee Sriskandan from the Department of Medicine at Imperial College London, the senior author of the study, said: "We know very little about how group A streptococcus is transmitted from person to person. We need to look into this more deeply and think about better ways to prevent transmission.

"This discovery was made possible thanks to the cooperation of our hospital diagnostic lab and the national reference lab, which helped us to spot a pattern locally and then study it nationally.

"Luckily, the new variant remains exquisitely sensitive to penicillin and related antibiotics. But we also need to think about whether our treatment strategies are as good as they can be."

More information: 'Emergence of a New Highly Successful Acapsular Group A Streptococcus Clade of the Genotype emm89 in the United Kingdom.' *mBio* 6(4):e00622-15. [DOI: 10.1128/mBio.00622-15](https://doi.org/10.1128/mBio.00622-15)

Provided by Imperial College London

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