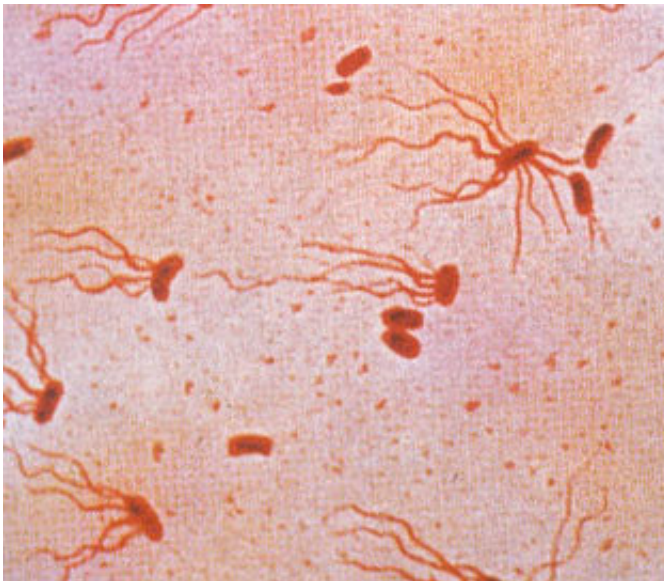


Fight against drug-resistant typhoid aided by new genomic resource

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Salmonella typhi. Credit: Wikipedia

A new online resource gives the public health community the power to track antimicrobial resistance in *Salmonella Typhi* (*S. Typhi*), the bacterium that causes typhoid fever, using genomic sequencing. Improving surveillance in this way enables early interventions to minimize the spread of the disease.

The free community-driven tool called Typhi Pathogenwatch was developed by the Center for Genomic Pathogen Surveillance at the Big Data Institute, University of Oxford in conjunction with researchers at

the Wellcome Sanger Institute, London School of Hygiene and Tropical Medicine, University of Cambridge, Public Health England and the International Vaccine Institute. A new article in Nature Communications details how the system works and the scope of its functionality.

Typhoid fever is a highly contagious bacterial infection that is most common in parts of the world that have poor sanitation and limited access to clean water. In 2017, more than 10 million cases and more than 110,000 deaths were estimated globally, mostly among children and adolescents in Asia and sub-Saharan Africa.

S. Typhi is becoming increasingly resistant to antibiotics, particularly in low-resource settings where health support is limited. Early warning signs of [antimicrobial resistance](#) can be detected through whole genome sequencing of *S. Typhi*.

In the past, this kind of genome sequencing has only been possible in higher income countries and has required expert knowledge of genomics and bioinformatics. Pathogenwatch makes the genomic data rapidly accessible to a broad range of people within the public health community via a web browser, where it can be easily analyzed and disseminated.

Routine surveillance using this resource, alongside whole genome sequencing, can inform decisions on treatments for [typhoid fever](#) and the introduction and impact of vaccine programs.

Pathogenwatch facilitates access to genomic data for public health on a global scale. The tool has the potential to sequence other infectious diseases, and has been deployed to help with the COVID-19 response by tracking variants of the SARS-CoV-2 virus.

Dr. Silvia Argimón, Genomic Epidemiologist at the Center for Genomic Pathogen Surveillance and lead author of the article said, "Genomics has

played a crucial role in our understanding of the spread of drug-resistant typhoid, but building capacity in bioinformatics and genomic epidemiology requires time and a sustained investment. Typhi Pathogenwatch can bridge this gap in settings where a sequencer is available but capacity is still limited."

Professor David Aanensen, Director of the Center for Genomic Pathogen Surveillance said, "Our aim is to deliver value to local data generators through rapid delivery of the right analytics and easy to use interfaces. Typhi Pathogenwatch is a partnership across the Typhi Genomics community who aim to democratize access to genomic data and technology for global public health decision making."

Provided by Big Data Institute

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