Inferring bacterial transmission dynamics using deep sequencing genomic surveillance data

Madikay Senghore ^{1*}, Hannah Read ², Priyali Oza ², Sarah Johnson ², Hemanoel Passarelli-Araujo ^{1,3}, Bradford P Taylor ¹, Stephen Ashley ², Alex Grey ², Alanna Callendrello ¹, Robyn Lee ^{1,4}, Matthew R Goddard ^{5,6}, Thomas Lumley ⁷, William P Hanage¹, Siouxsie Wiles ^{2,8*}

Author affiliations:

¹Center for Communicable Disease Dynamics, Department of Epidemiology, Harvard TH Chan School of Public Health, Boston, Massachusetts, USA

²Bioluminescent Superbugs Lab, Department of Molecular Medicine and Pathology, University of Auckland, Auckland, New Zealand

³Department of Biochemistry and Immunology, Federal University of Minas Gerais, Minas Gerais, Brazil

⁴University of Toronto Dalla Lana School of Public Health: Toronto, Ontario, Canada

⁵School of Biological Sciences, University of Auckland, Auckland, New Zealand

⁶School of Life and Environmental Sciences, University of Lincoln, UK

⁷Department of Statistics, University of Auckland, Auckland, New Zealand

⁸Te Pūnaha Matatini, Centre of Research Excellence in Complex Systems, New Zealand

These authors contributed equally: Madikay Senghore, Hannah Read.

These authors jointly supervised this work: William P Hanage, Siouxsie Wiles.

*Corresponding authors:

Madikay Senghore: msenghore@hsph.harvard.edu

Siouxsie Wiles: s.wiles@auckland.ac.nz

File name: Supplementary Data 1.

Description: This file is comprised of data for each individual animal. Data provided for the route of transmission (oral-gavage or natural transmission); median weight (g); range in weight over the 14-day infection (g); weight change between the start and end of the infection (%); weight change between the start and day 7 of infection (%); bacterial counts prior to comingling (colony forming units per gram of stool); calculated area under curve values for bacterial shedding (colony forming units per g stool over the course of the 14-day infection).

File name: Supplementary Data 2.

Description: This file is comprised of data for each single nucleotide variant (SNV). Data provided for position in the genome; base in the reference genome; base in the query sequence; SNV category (downstream gene variant, upstream gene variant, missense variant, stop gained, synonymous variant, non-coding transcript exon variant, splice region variant & non-coding transcript exon variant); effect (low, moderate, high, modifier); gene; locus; accession number; gene type (protein coding, sRNA, pseudogene).