

Descriptions of Additional Supplementary Files

Supplementary Data 1

Description: Kleborate species validation data.

Supplementary Data 2

Description: Isolate collection metadata and Kleborate genotyping results for publicly-available *Klebsiella* genomes analysed in this study.

Supplementary Data 3

Description: Comparison of virulence and AMR detection or genotypes by Kleborate vs. those reported in the EuSCAPE study.

Supplementary Data 4

Description: Data summary of publicly-available *Klebsiella* genomes.

Supplementary Data 5

Description: Virulence loci prevalence and lineage distribution in KpSC species.

Supplementary Data 6

Description: Frameshift mutations and incomplete loci detection in virulence determinants of non-redundant *K. pneumoniae* genomes.

Supplementary Data 7

Description: Summary of convergent genomes and convergence events.

Supplementary Data 8

Description: Kleborate genotyping results for metagenomes (non-binned vs. binned by species) and matched whole genome sequences from the Baby Biome Study.

Supplementary Data 9

Description: Summary of genotyping outputs for metagenome-assembled genomes (i.e. binned) vs. matched whole genome sequences from the Baby Biome Study.

Supplementary Data 10

Description: Studies citing Kleborate.

Supplementary Data 11

Description: Summary of key mutations in SHV and associations with β -lactamase subclasses.

Supplementary Data 12

Description: SHV mutations.

Supplementary Data 13

Description: Summary of publicly-available genome data.