

Large-scale statistical analysis of *Mycobacterium tuberculosis* genome sequences identifies compensatory mutations associated with multi-drug resistance

Nina Billows^{1,2}, Jody Phelan², Dong Xia¹, Yonghong Peng³, Taane Clark^{2,4}, Yu-Mei Chang¹

¹Royal Veterinary College, University of London, London, UK

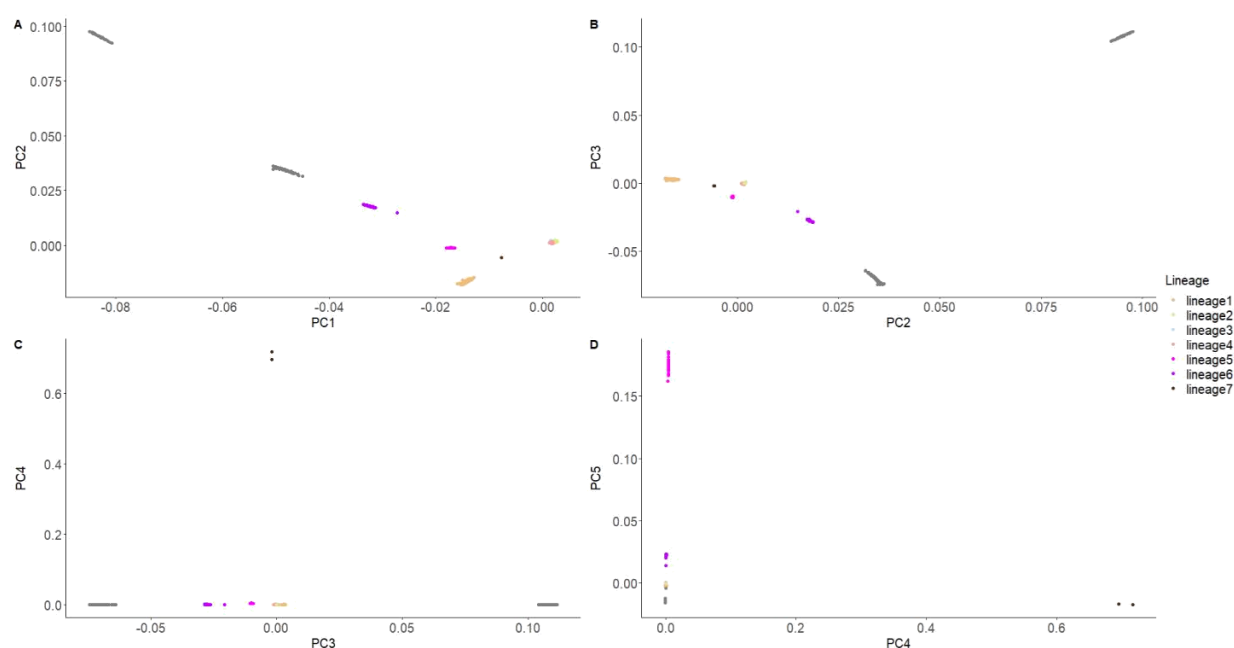
²Faculty of Infectious and Tropical Diseases, London School of Hygiene & Tropical Medicine, London, UK

³Manchester Metropolitan University, Manchester, UK

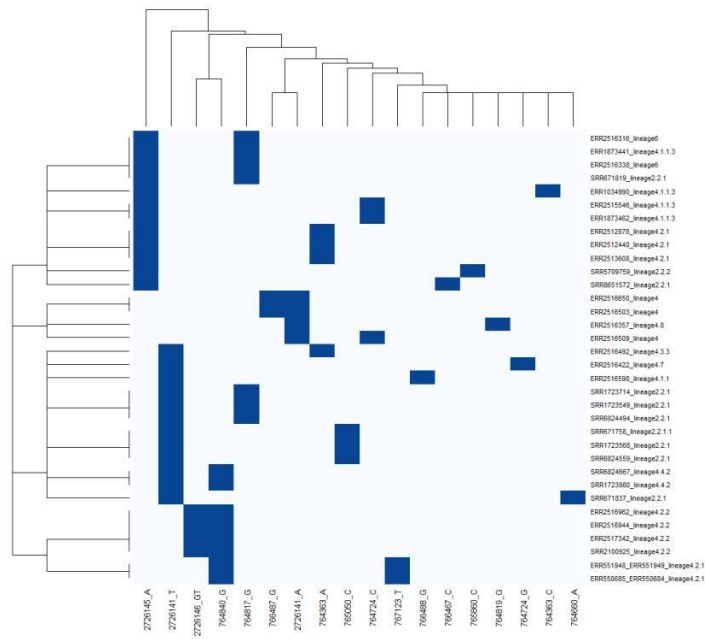
⁴Faculty of Epidemiology and Population Health, London School of Hygiene & Tropical Medicine, London, UK

*Nina.Billows@LSHTM.ac.uk

Supplementary Figures

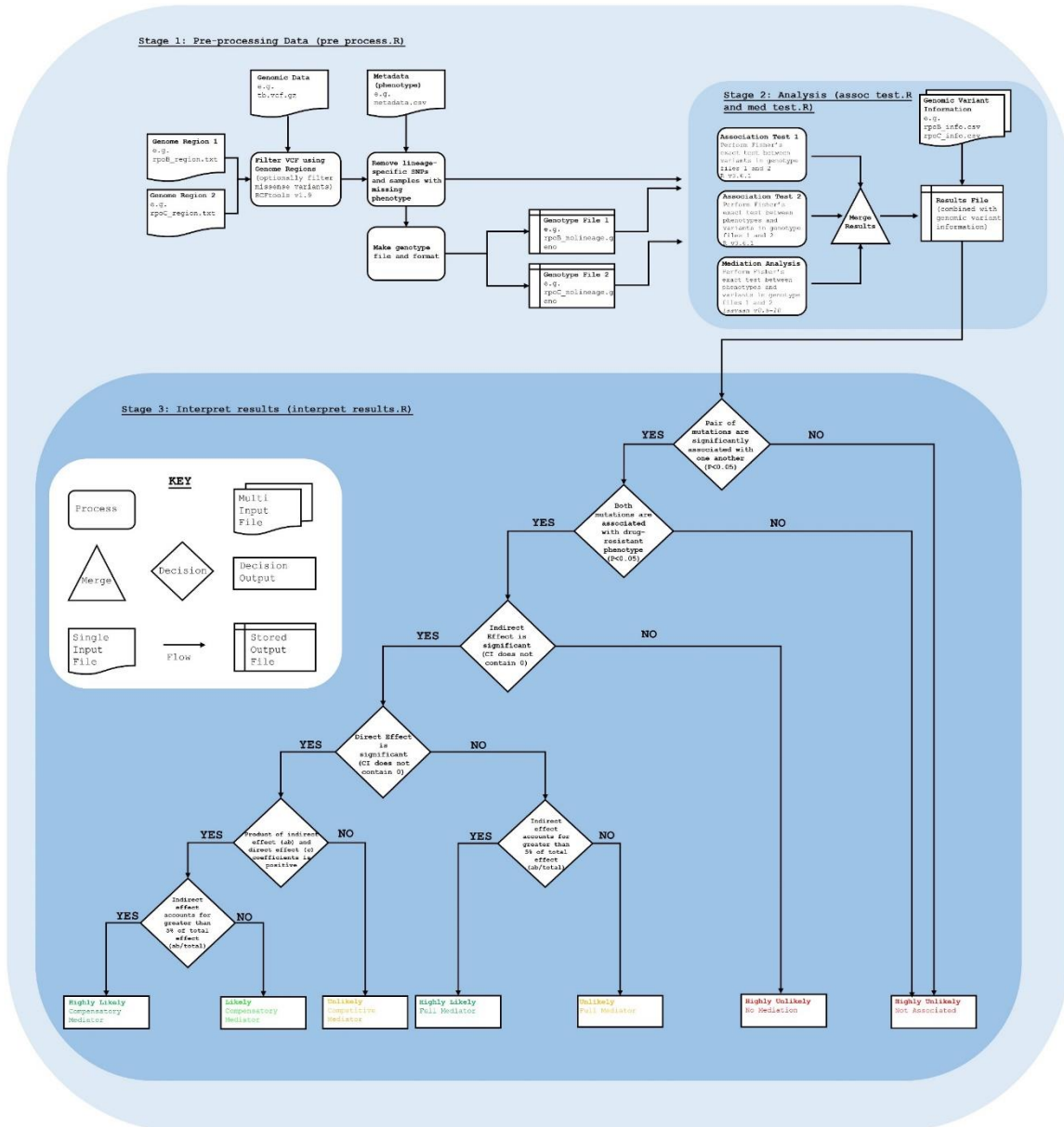


Supplementary Figure S1. Principal Component Analysis of the global *M. tuberculosis* dataset. Principal components (PC) 1-5 are plotted for 18,396 isolates in the dataset and are colour coded by lineage. PCA was carried out using PLINK (v1.90) software.



Supplementary Figure S2. Co-occurring putative compensatory mutations in MDR isolates. MDR isolates with more than one putative compensatory mutation are shown alongside their respective mutations. The lineage of each sample is also shown.

A Systematic Framework to Identify Compensatory Mutations from *Mycobacterium tuberculosis* Whole Genome Sequences



 NinaMercedes (<https://github.com/NinaMercedes>)

Supplementary Figure S3. Overview of systematic framework to identify compensatory mutations.

Flow diagram summarises three stages of analysis and the key is shown.