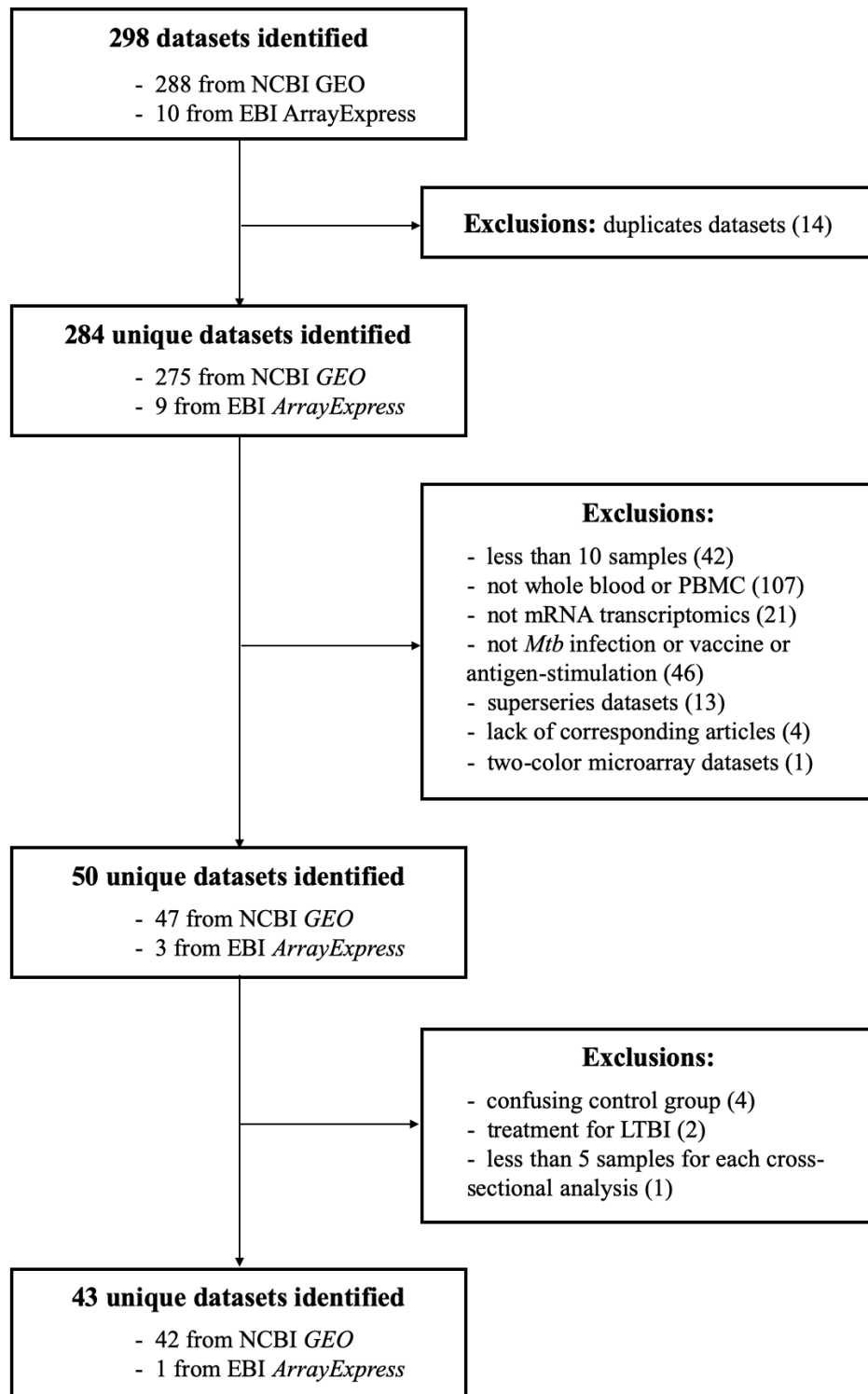
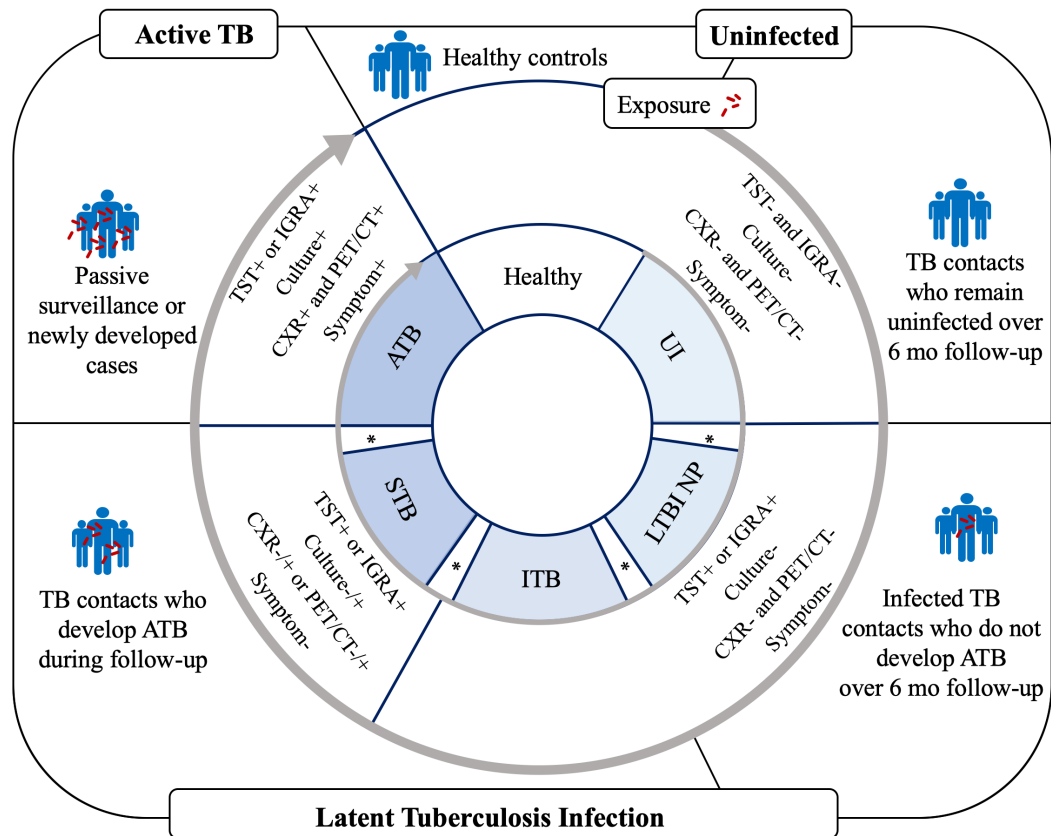


Supplementary Figures for **Zhu *et al.***, “Peripheral blood cellular dynamics along the evolution and treatment of human tuberculosis”

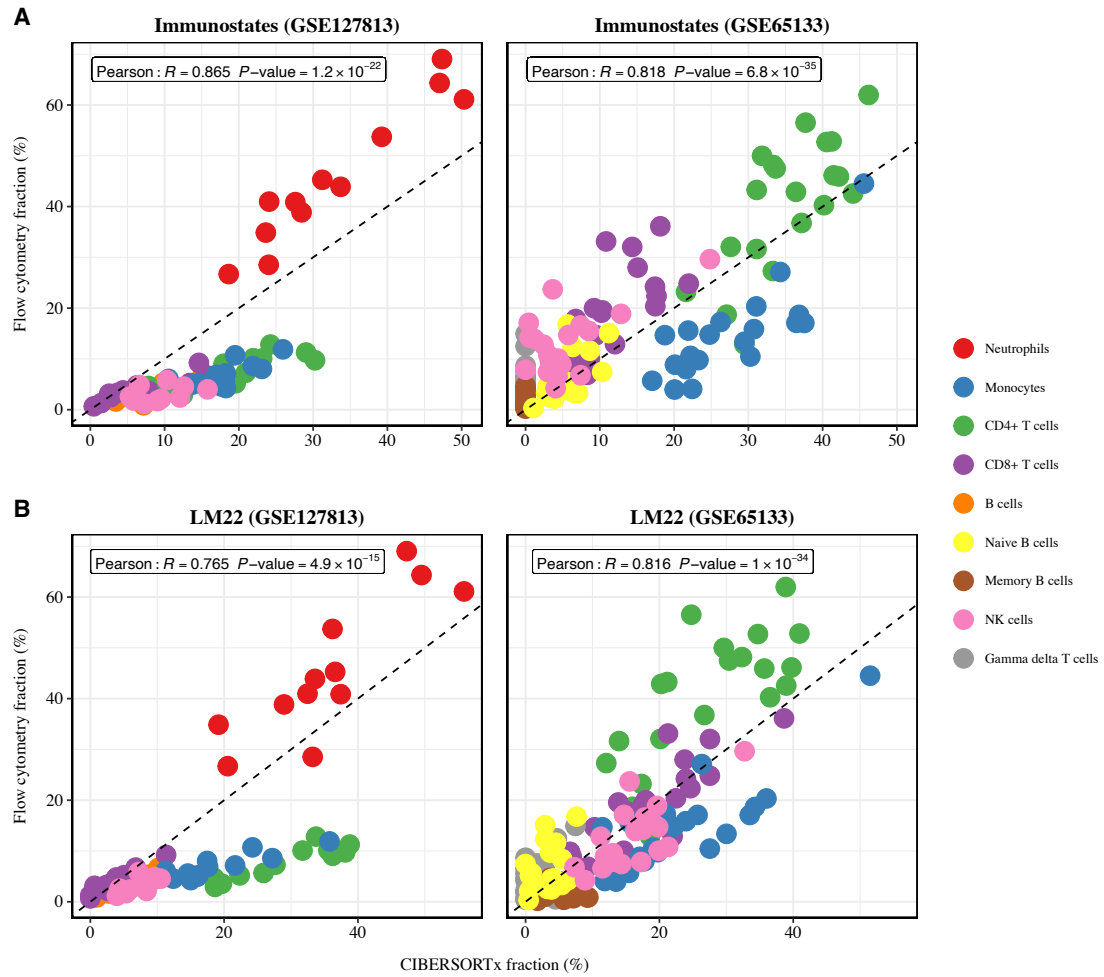


Supplementary Figure S1. Flowchart of literature search and study selection.

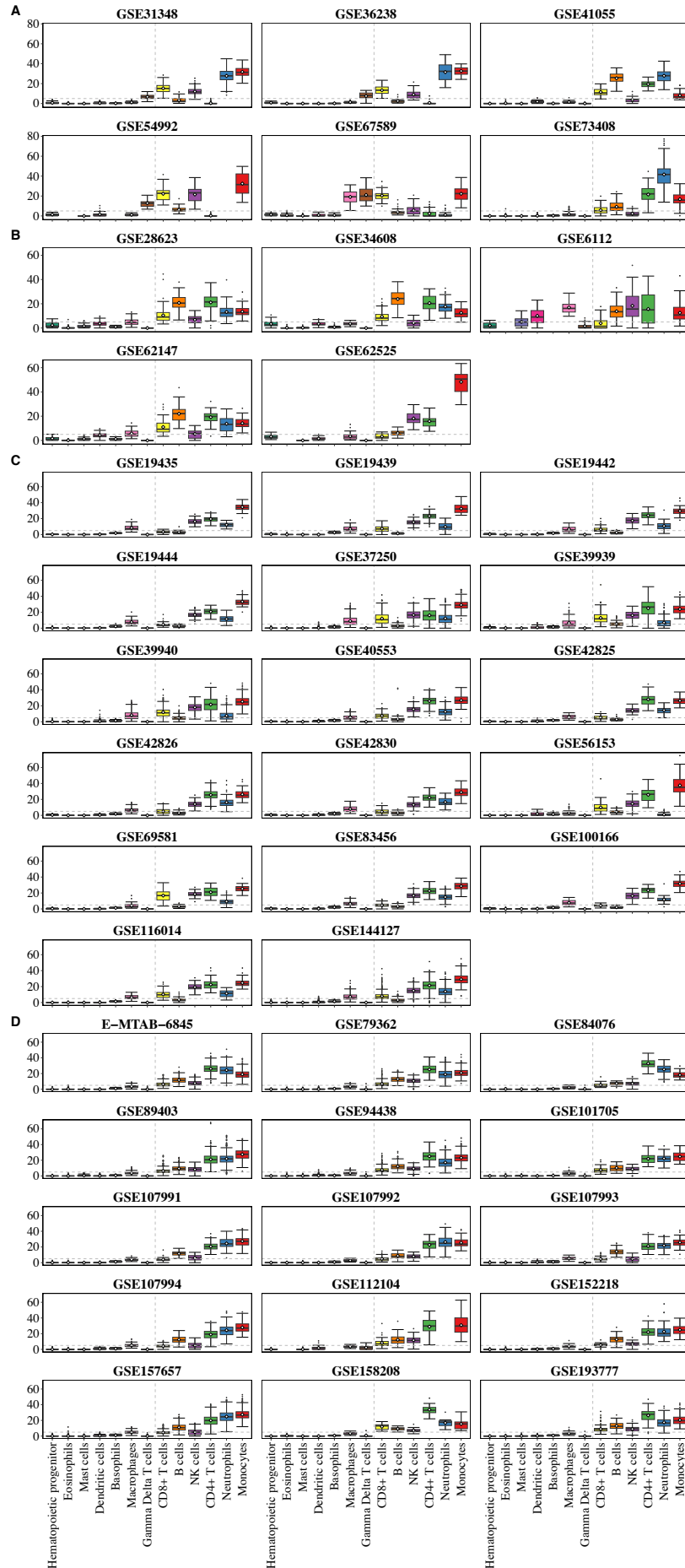


Supplementary Figure S2. Overview of TB disease states post-*Mtb* infection, including phenotypic classification of blood samples.

*: Unclassified LTBI; mo: months; TST: tuberculin skin test; IGRA: IFN- γ release assay; Culture: bronchoalveolar lavage, pleural fluid, or sputum culture; CXR: chest X-ray; PET/CT: positron emission tomography/computed tomography.



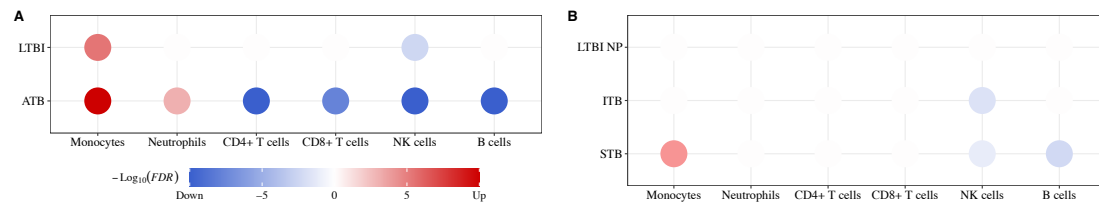
Supplementary Figure S3. Benchmarking of reference signature matrices (*ImmunoStates* and *LM22*) for blood cell deconvolution. Proportions of nine blood cell types were estimated using *CIBERSORTx* from two gene expression datasets (RNA-seq: *GSE127813*, Microarray: *GSE65133*). Plots compare the computational estimates with flow cytometry measures for **(A)** *ImmunoStates* and **(B)** *LM22*, showing *Pearson* correlation (R) and statistical significance (P -value).



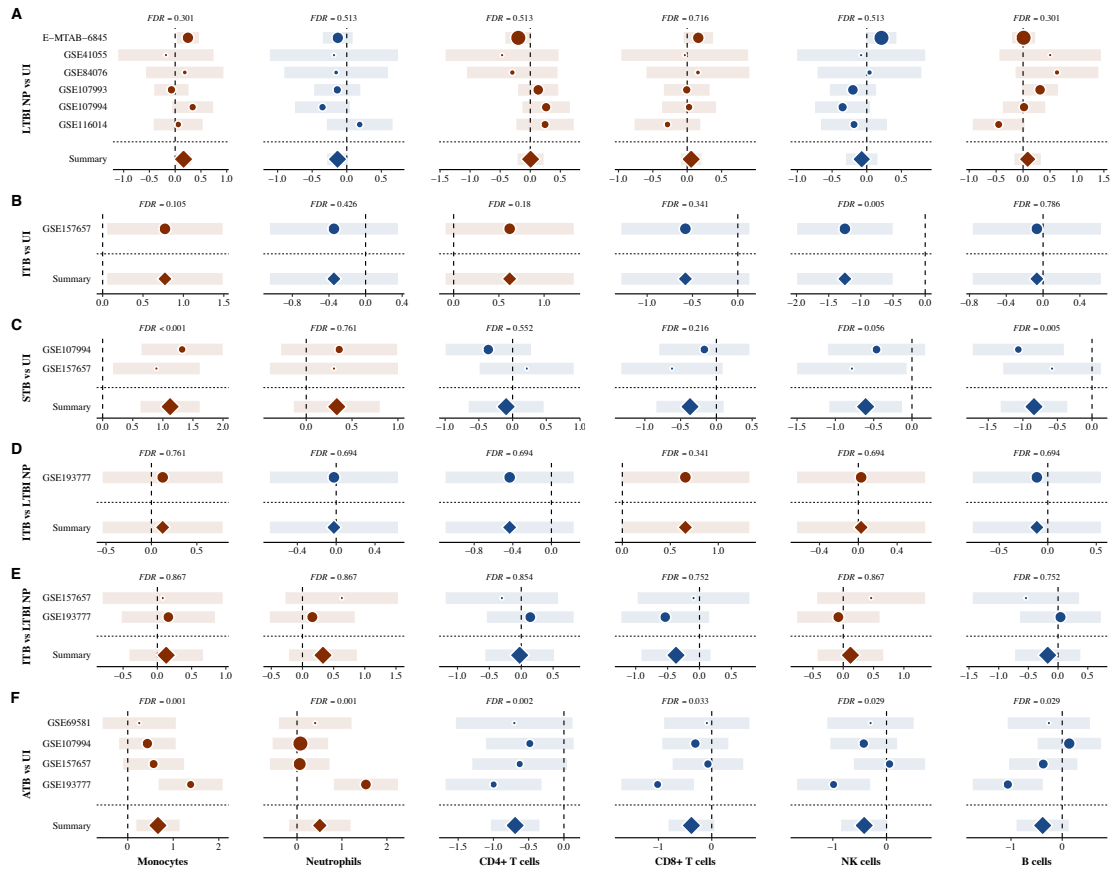
Supplementary Figure S4. Relative cell fractions of 13 blood cell types estimated using *CIBERSORTx* and the *ImmunoStates* signature matrix from **(A)** *Affymetrix*, **(B)** *Agilent*, **(C)** *Illumina* microarray datasets, and **(D)** *Illumina* RNA-seq datasets.



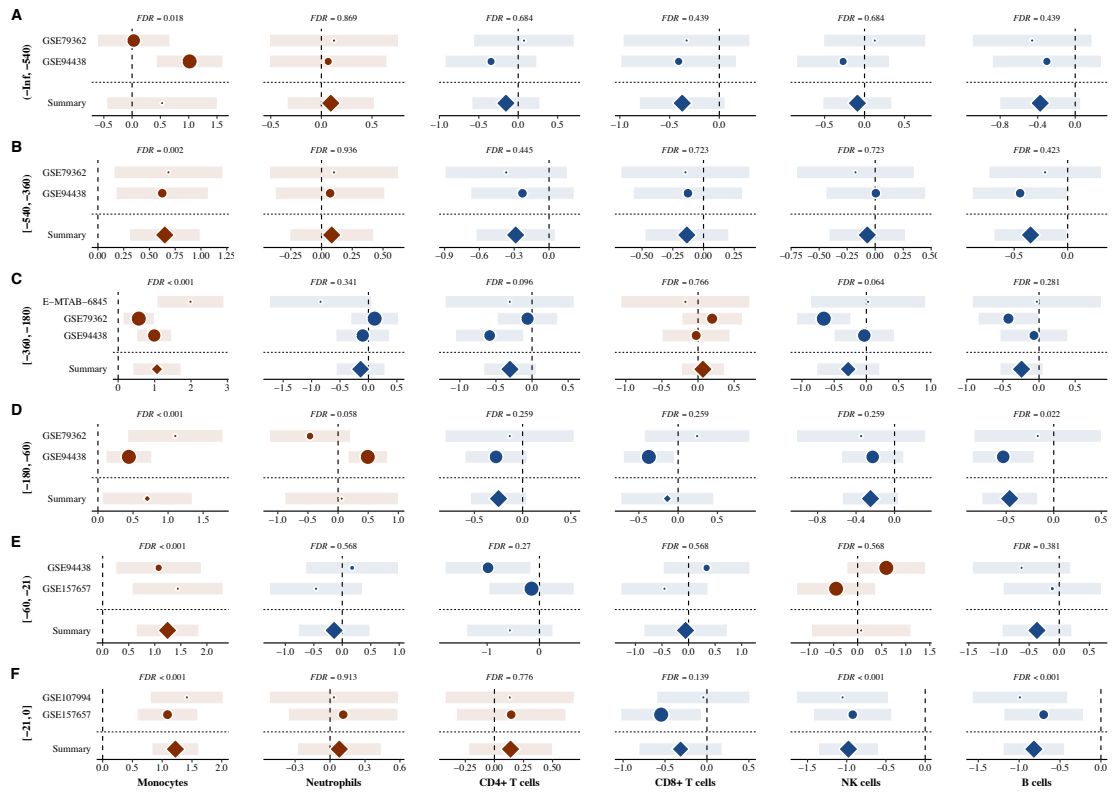
Supplementary Figure S5. Forest plots comparing compositional changes in circulating blood between **(A)** LTBI and UI, **(B)** ATB and UI, and **(C)** ATB and LTBI across global cohorts. Circles indicate standardized mean differences (*ES*), with sizes proportional to cohort sample sizes, while strips represent 95% confidence intervals. Diamonds summarize overall differences, and *FDR* values indicate statistical significance.



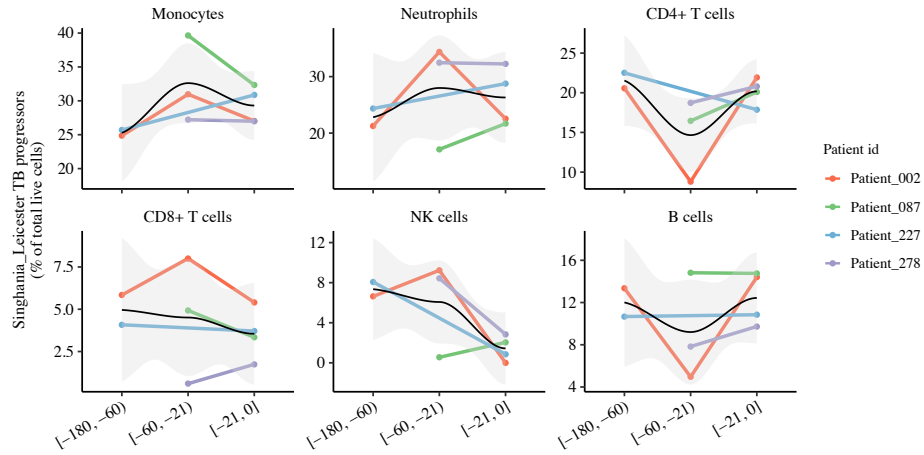
Supplementary Figure S6. Bubble plots of compositional changes in six blood cell types among **(A)** LTBI individuals and ATB patients, and **(B)** LTBI non-progressors, ITB, and STB patients, after accounting for confounding factors such as TB burden, age, and HIV-coinfection. Red bubbles indicate compositional increases, while blue bubbles indicate decreases, with $FDR < 0.1$ as the significance cutoff. White circles represent non-significant comparisons.



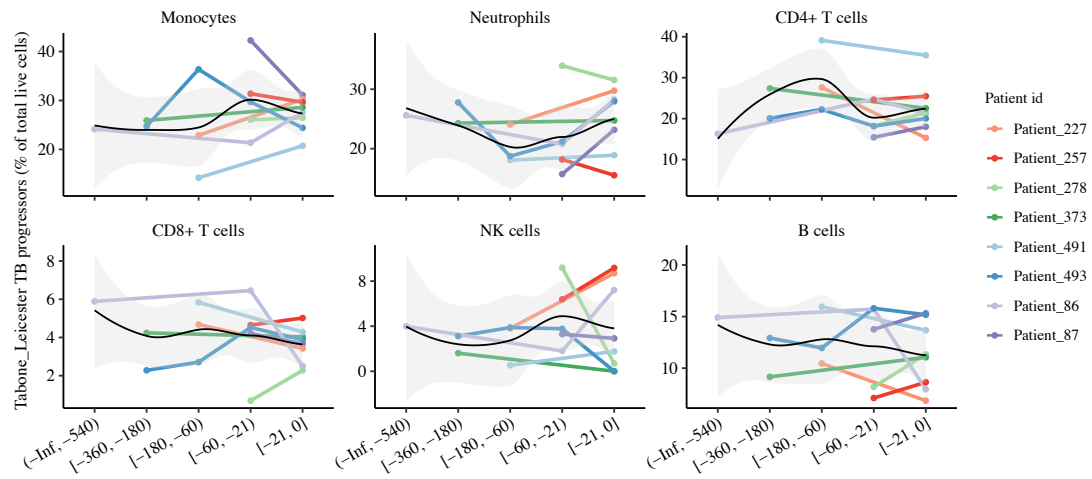
Supplementary Figure S7. Forest plots of compositional changes across global cohorts between **(A)** LTBI NP and UI, **(B)** ITB and UI, **(C)** STB and UI, **(D)** ITB and LTBI NP, **(E)** STB and ITB, and **(F)** ATB and STB. Circles and diamonds represent *ES* values and summary differences, with *FDR* values denoting significance.



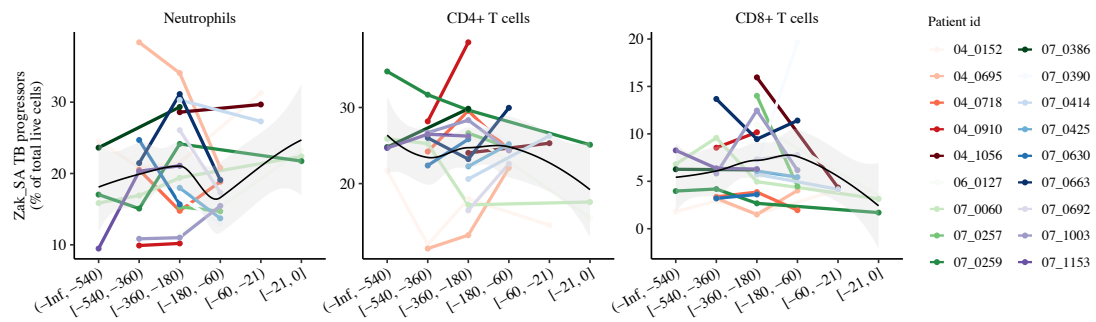
Supplementary Figure S8. Forest plots of monocyte, neutrophil, CD4+ T cell, CD8+ T cell, NK cell, and B cell compositional changes in ATB progressors at different time intervals before diagnosis: **(A)** $(-\infty, -540)$, **(B)** $[-540, -360)$, **(C)** $[-360, -180)$, **(D)** $[-180, -60)$, **(E)** $[-60, -21)$, and **(F)** $[-21, 0]$ days, compared to UI individuals. Circles and diamonds represent *ES* values and summary differences, with *FDR* values denoting significance.



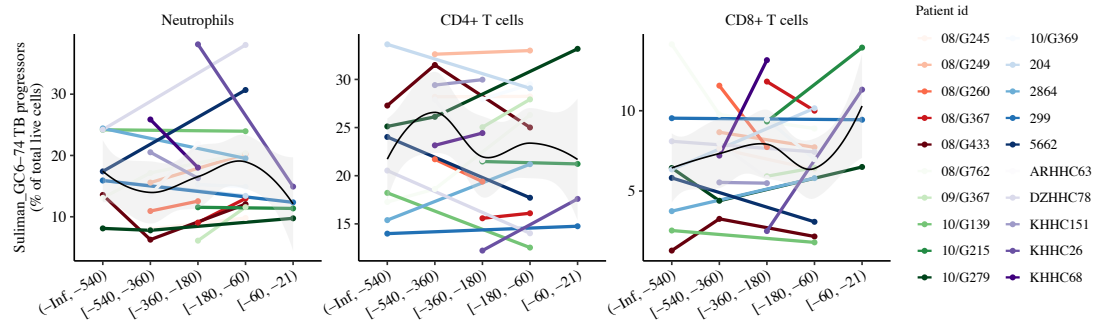
Supplementary Figure S9. Blood cell compositions (monocytes, neutrophils, CD4+ T cells, CD8+ T cells, NK cells, B cells) of ATB progressors in the *Singhania_Leicester* cohort at three intervals: [-180, -60), [-60, -21), and [-21, 0) days before diagnosis. The gray area shows 95% confidence intervals for mean cell compositions.



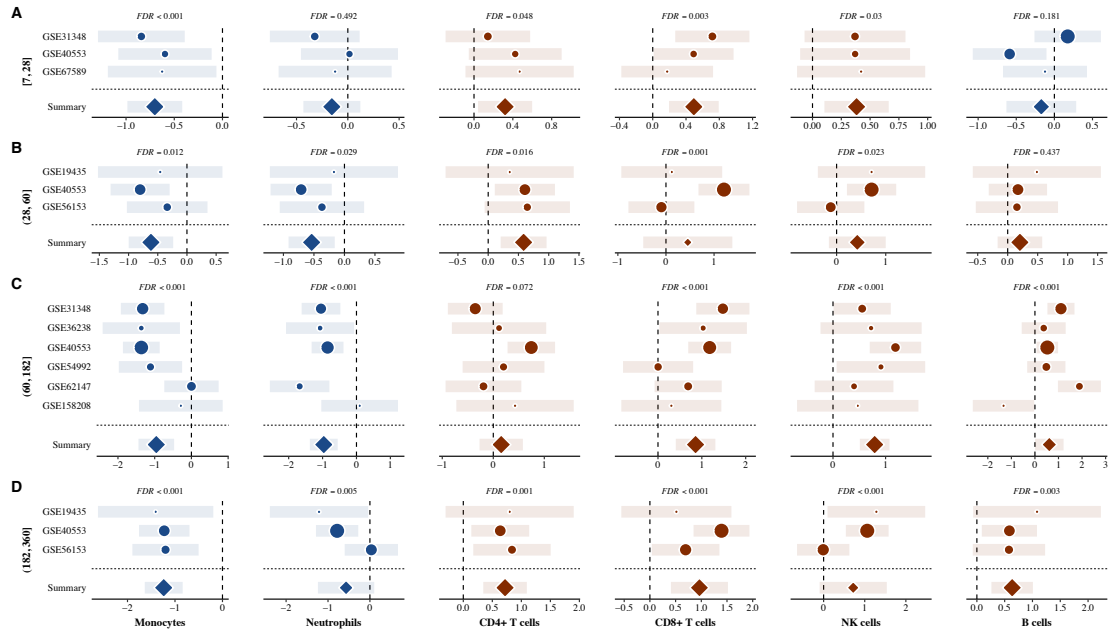
Supplementary Figure S10. Blood cell compositions of ATB progressors in the *Tabone_Leicester* cohort at five intervals: $(-\infty, -540)$, $[-540, -360)$, $[-360, -180)$, $[-180, -60)$, and $[-60, -21)$ days before diagnosis. The gray area indicates 95% confidence intervals for mean cell compositions.



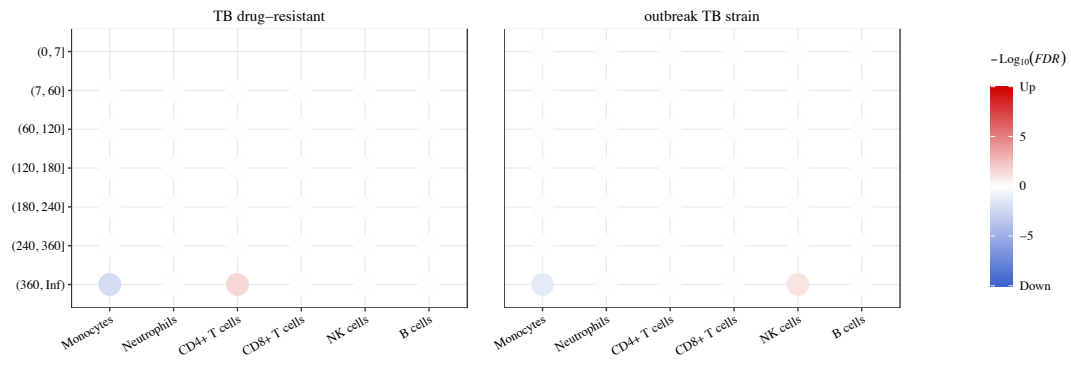
Supplementary Figure S11. Blood cell compositions of ATB progressors in the *Zak_SA* cohort at six intervals: $(-\infty, -540)$, $[-540, -360)$, $[-360, -180)$, $[-180, -60)$, $[-60, -21)$, and $[-21, 0]$ days. The gray area shows 95% confidence intervals for mean cell compositions.



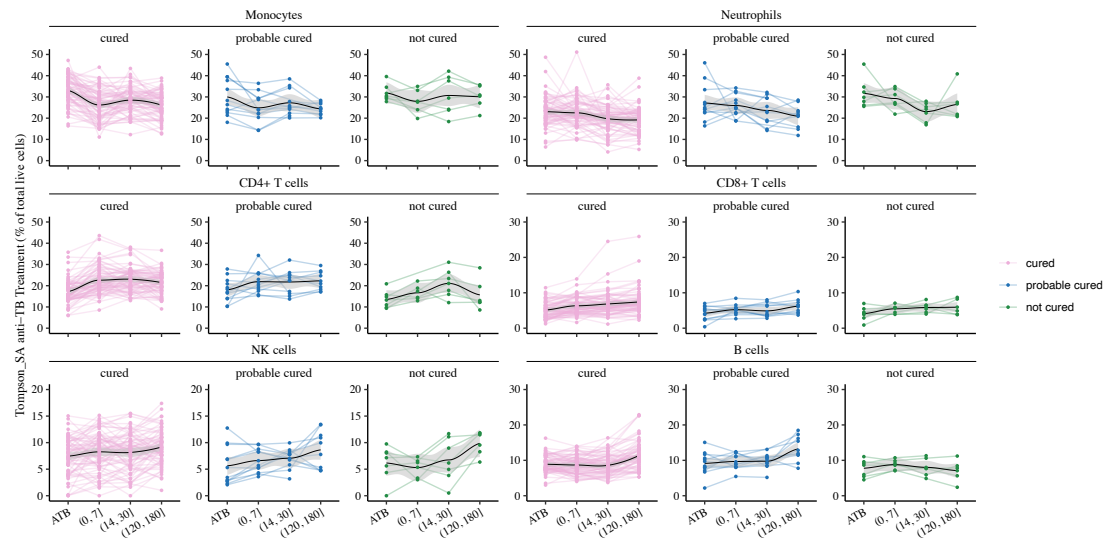
Supplementary Figure S12. Blood cell compositions of ATB progressors in the *Suliman_GC6-74* cohort at five intervals: $(-\infty, -540)$, $[-540, -360)$, $[-360, -180)$, $[-180, -60)$, and $[-60, -21)$ days. The gray area indicates 95% confidence intervals for mean cell compositions.



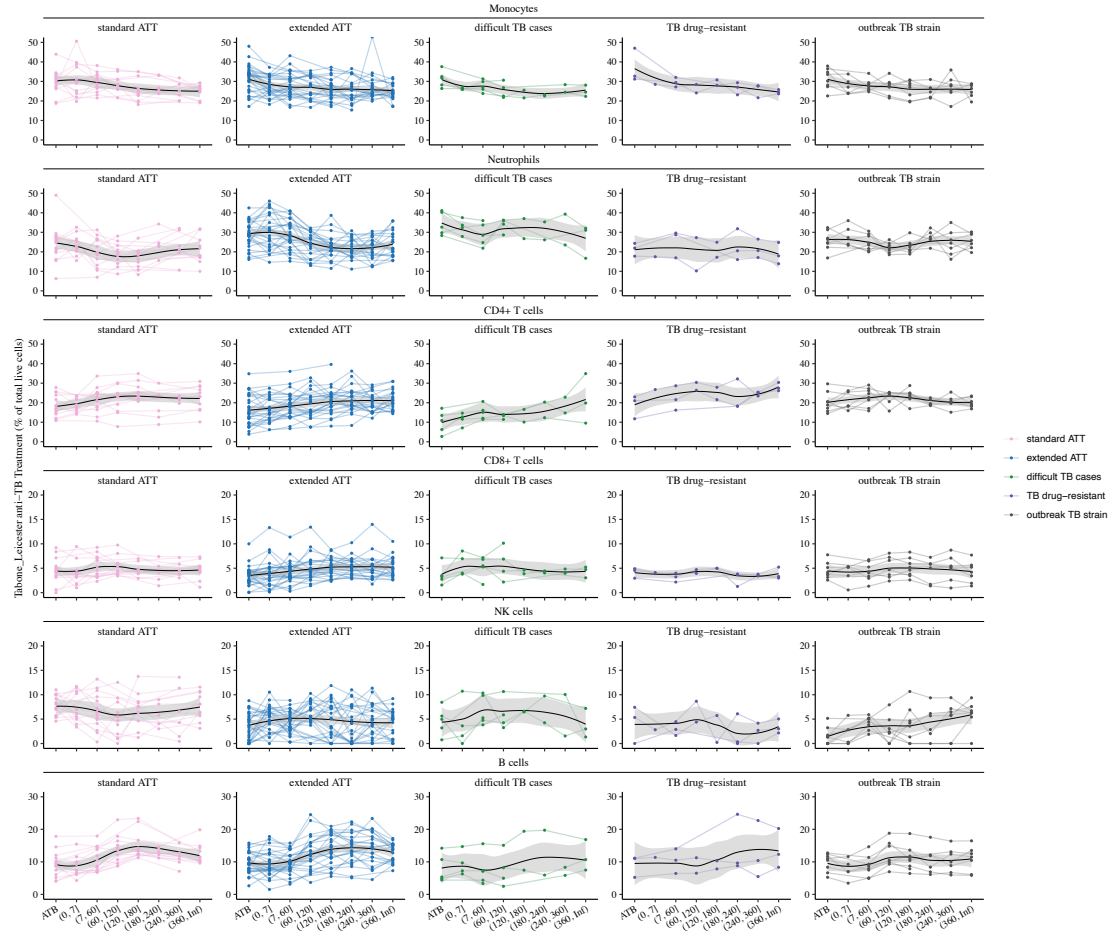
Supplementary Figure S13. Forest plots of compositional changes in monocytes, neutrophils, CD4+ T cells, CD8+ T cells, NK cells, and B cells in ATB patients across global cohorts at (A) 7-28, (B) 28-60, (C) 60-182, and (D) 182-360 days after ATT.



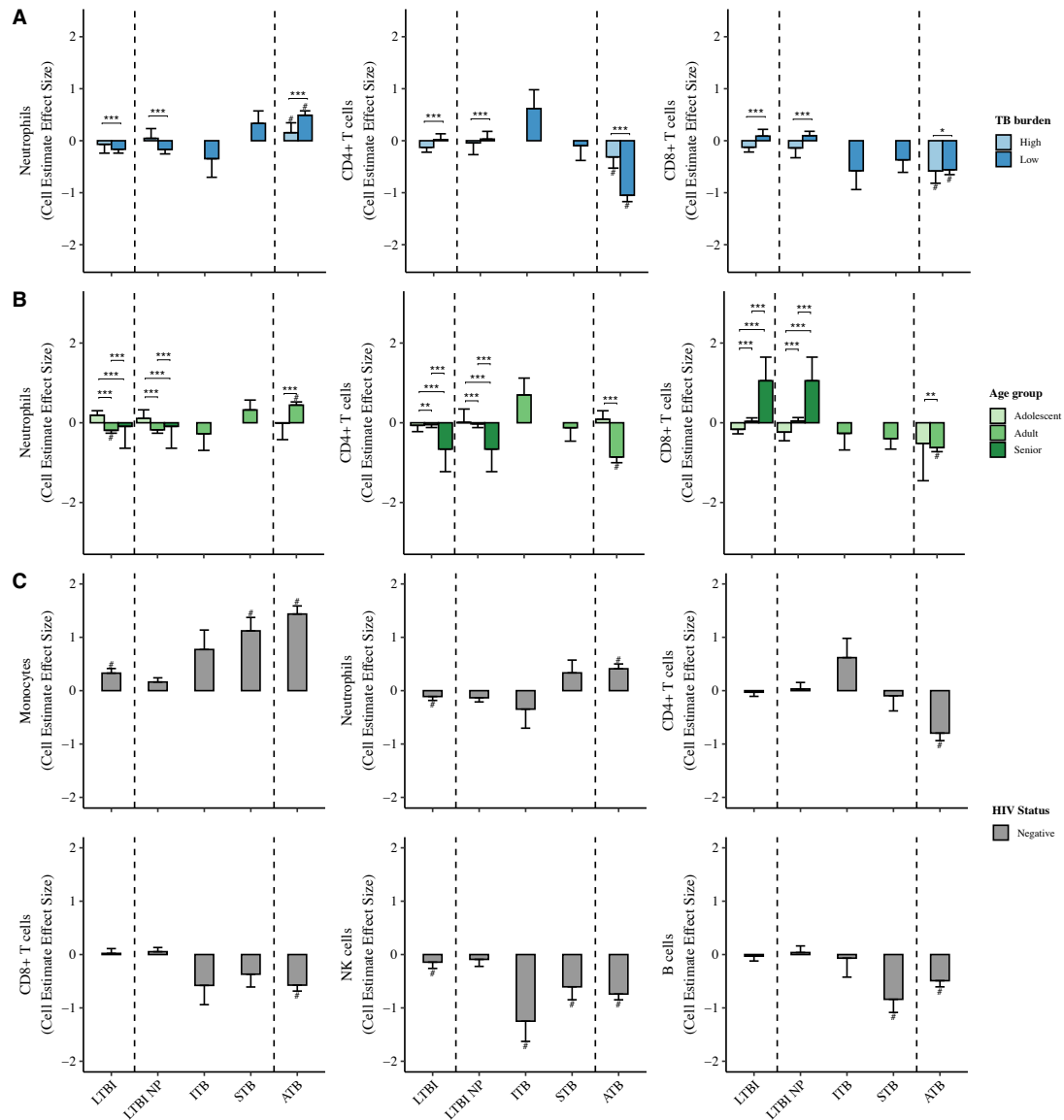
Supplementary Figure S14. Bubble plot of compositional changes in six cell types in ATB patients across seven ATT intervals: (0, 7], [7, 60], (60, 120], (120, 180], (180, 240], (240, 360], (360, inf) days, for TB drug-resistant and outbreak TB strain subgroups within the *Tabone_Leicester* cohort.



Supplementary Figure S15. Blood cell compositions of ATB patients in the *Thompson_SA* cohort at diagnosis and three ATT intervals: (0, 7], (14, 30], and (120, 180] days. Patients are grouped by outcomes: cured, probable cured, and not cured. The gray area indicates 95% confidence intervals for mean cell compositions.



Supplementary Figure S16. Blood cell compositions of ATB patients in the *Tabone_Leicester* cohort at diagnosis and seven ATT intervals: (0, 7], [7, 60), (60, 120], (120, 180], (180, 240], (240, 360], and (360, inf) days. Subgroups include standard ATT, extended ATT, difficult TB cases, TB drug-resistant, and outbreak TB strain. The gray area indicates 95% confidence intervals for mean cell compositions.



Supplementary Figure S17: Bar plots of compositional changes in (A) neutrophils, CD4+ T cells, and CD8+ T cells between high- and low-burden countries, (B) age groups (adolescent, adult, senior), and (C) participants without HIV. *X*-axis indicates TB stages, *Y*-axis shows cohort-summary *ES* values.

indicates a significant compositional change in multi-cohort meta-analysis with $FDR < 0.1$. Error bars represent the 95% confidence intervals of the effect size (*ES*) values. The statistical significance of compositional differences between two subgroups were assessed using two-tailed unpaired *t*-tests with *Benjamini–Hochberg* correction. Significance thresholds are denoted as follows: ns (not significant): P -value > 0.1 ; *: P -value < 0.1 ; **: P -value < 0.01 ; and ***: P -value < 0.001 .