## **Clinical data Genetic data** Table 1 Generate a Generate enriched subset Fig 1b-e describes the cohort of candidate SNPs non-redundant dataset visualize details by utilizing prior of the approach biological knowledge Fig S5 Fig S1 + S3 depicts patient similarity before and Reduces number of patients Reduces number of SNPs depict qq plot and after removing from n = 457 to n = 268from n = 86,444 to n = 960Manhattan plot similar patients highlighting SNP subsets Forward feature selection Fig 2a of clinical features depicts ranking of clicnical features using ANN Using the same nested cross-validation, as described in Fig S4 Results in four clinical traits Forward feature selection Fig 2b-c of SNPs on top of the depict ranking selected four clincial traits of SNPs using ANN Table 2 Results in eight SNPs describes selected SNPs Evaluate performance Fig 3c of ANN models depicts ROC curves with the selected clinical traits and/or SNPs Table 3 + Table S1 show performance improvement Table S2 shows results from permutation tests Downstream analyses Fig 2d depicts importance of selected features with directionality Fig 3 a-b, d subgroup analyses