

Description of Additional Supplementary Files

Supplementary Data 1: Baseline characteristics of the two study cohorts.

Supplementary Data 2: Baseline characteristics of controls and five LCA-derived subgroups in the MCB development cohort.

Supplementary Data 3: PRS distribution by group and cross-group comparisons of eight PRSs in the MCB development cohort.

Supplementary Data 4: Cross-group comparisons of six clinical variables in the MCB development cohort.

Supplementary Data 5: Cross-group comparison of prevalence of liver transplant and comorbidities in the MCB development cohort.

Supplementary Data 6: Baseline characteristics of controls and five subgroups from probability based assignment in the MCB validation cohort.

Supplementary Data 7: Baseline characteristics of controls and five subgroups from centroid based assignment in the MCB validation cohort.

Supplementary Data 8: Baseline characteristics of controls and five subgroups from core-points based assignment in the MCB validation cohort.

Supplementary Data 9: Cross-group comparisons of clinical variables from three assignment methods in the MCB validation cohort.

Supplementary Data 10: Cross-group comparison of comorbidities from three assignment approaches in the MCB validation cohort.

Supplementary Data 11: Baseline characteristics of controls and five subgroups from probability based assignment in Tapestry cohort.

Supplementary Data 12: Baseline characteristics of controls and five subgroups from centroid based assignment in Tapestry cohort.

Supplementary Data 13: Baseline characteristics of controls and five subgroups from core-points based assignment in Tapestry cohort.

Supplementary Data 14: Cross-group comparison of clinical variables from three assignment approaches in Tapestry cohort.

Supplementary Data 15: Cross-group comparison of prevalence of liver transplant and comorbidities from three assignment approaches in Tapestry cohort.

Supplementary Data 16: Risk of MASLD related intrahepatic and extrahepatic disease complications across subgroups in Tapestry cohort.

Supplementary Data 17: Changes of biomarkers over six years within each subgroup assigned in Tapestry cohort.

Supplementary Data 18: Association of medication with subgroups C2–C5 relative to C1 stratified by liver disease and comorbidities.

Supplementary Data 19: Changes of biomarkers over six years within each subgroup stratified by medication.

Supplementary Data 20: Baseline characteristics of subtypes assigned based on cluster coordinates from the UK Biobank and ABOS cohorts.