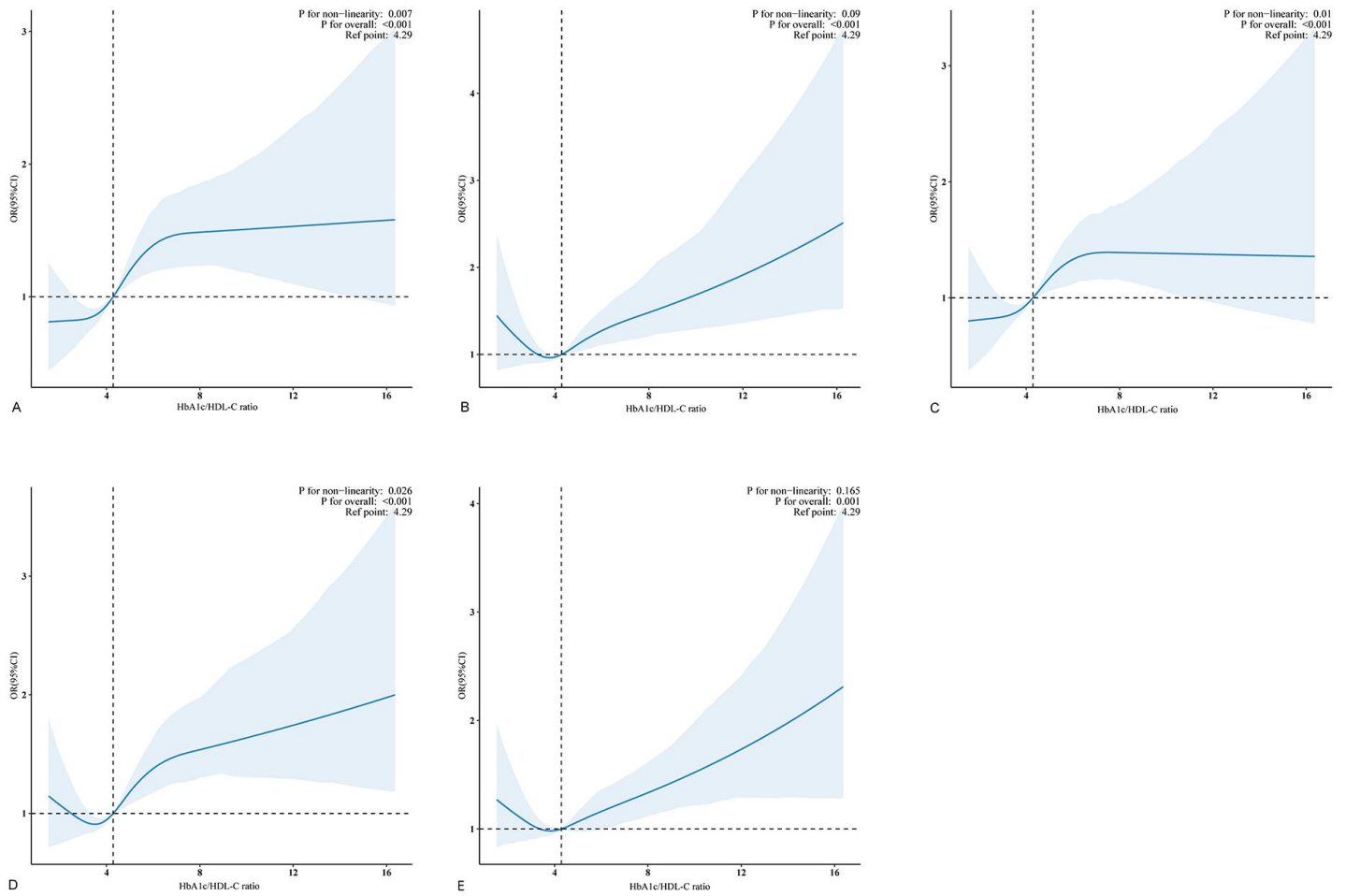
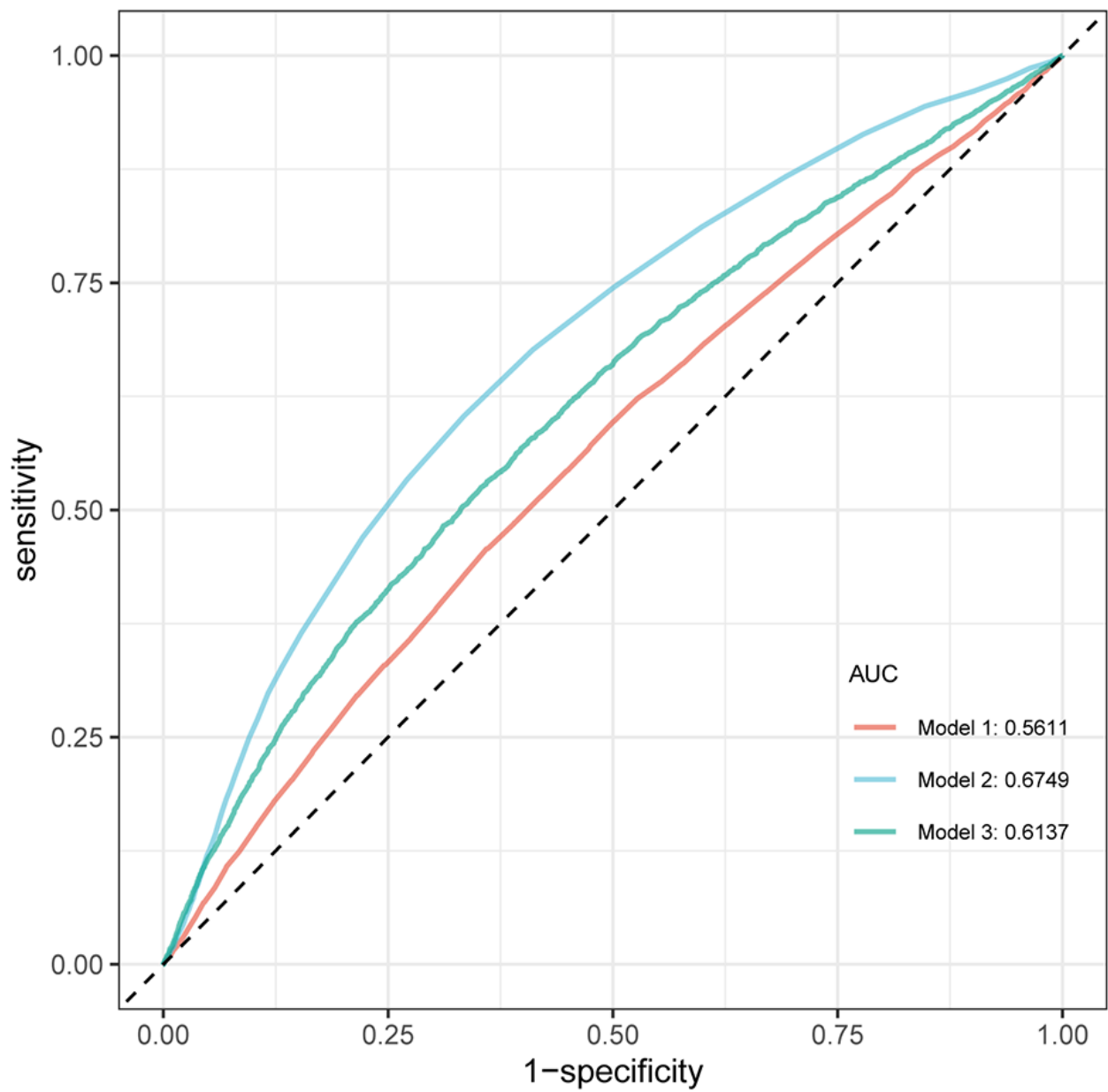


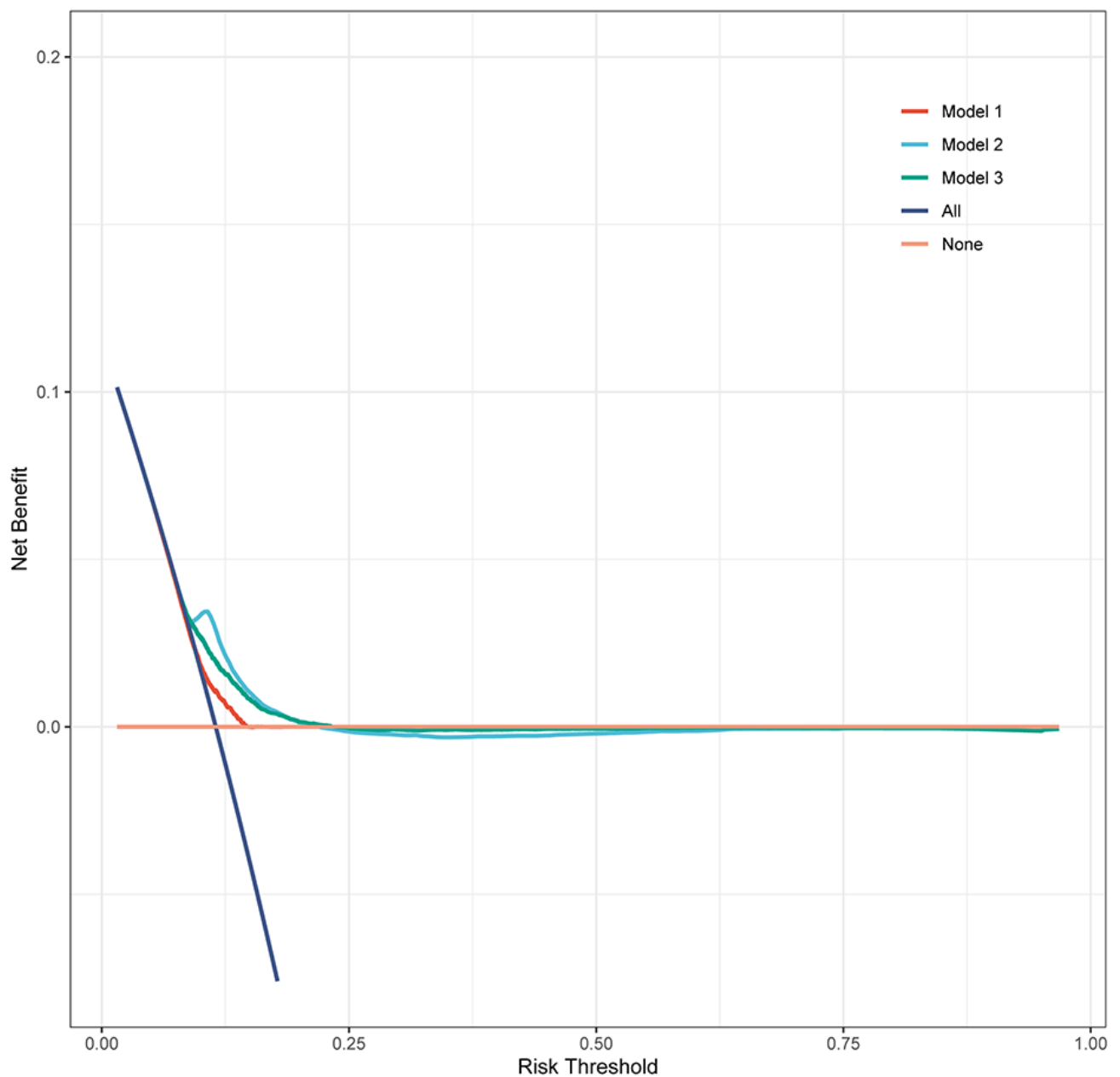
Supplementary Figures



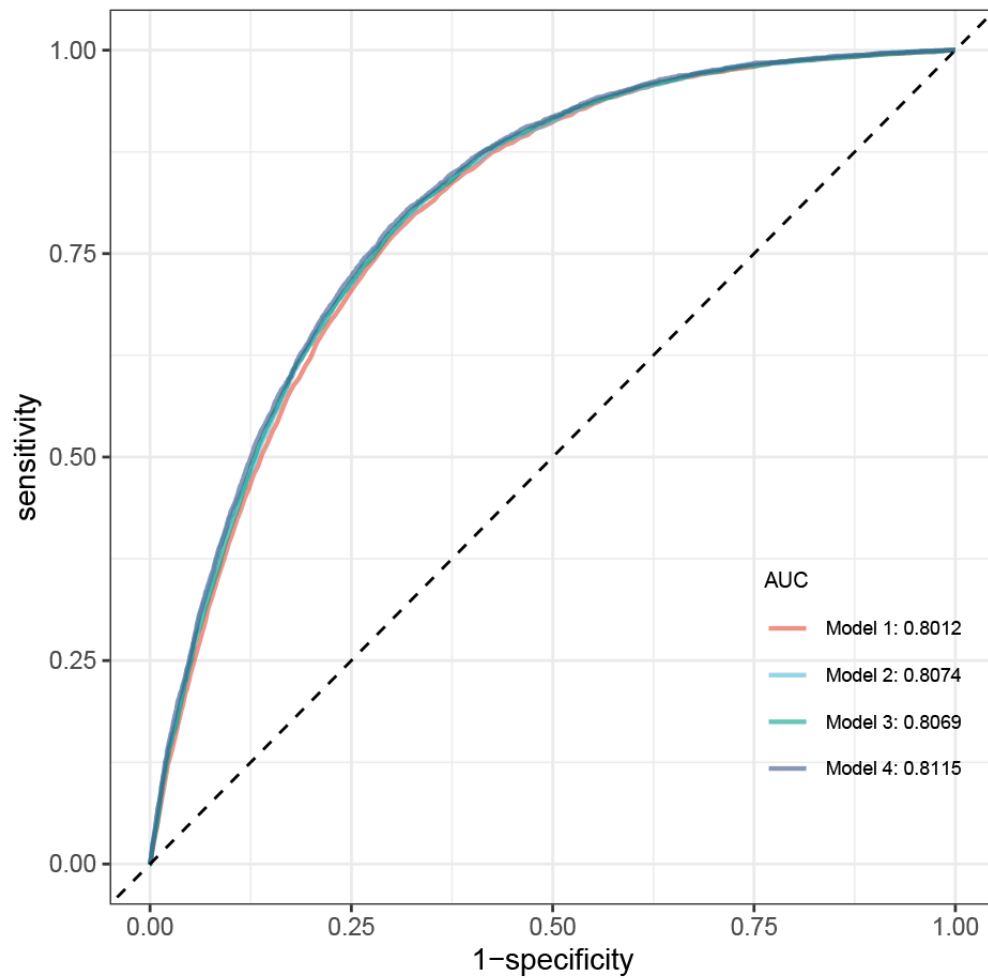
Supplementary Figure 1. Nonlinear associations between HbA1c/HDL-C ratio and individual cardiovascular disease components using restricted cubic spline analysis. (A) Heart disease, (B) Heart failure, (C) Angina pectoris, (D) Myocardial infarction, (E) Stroke. The solid red lines represent smooth curve fits between variables, with blue bands indicating 95% confidence intervals.



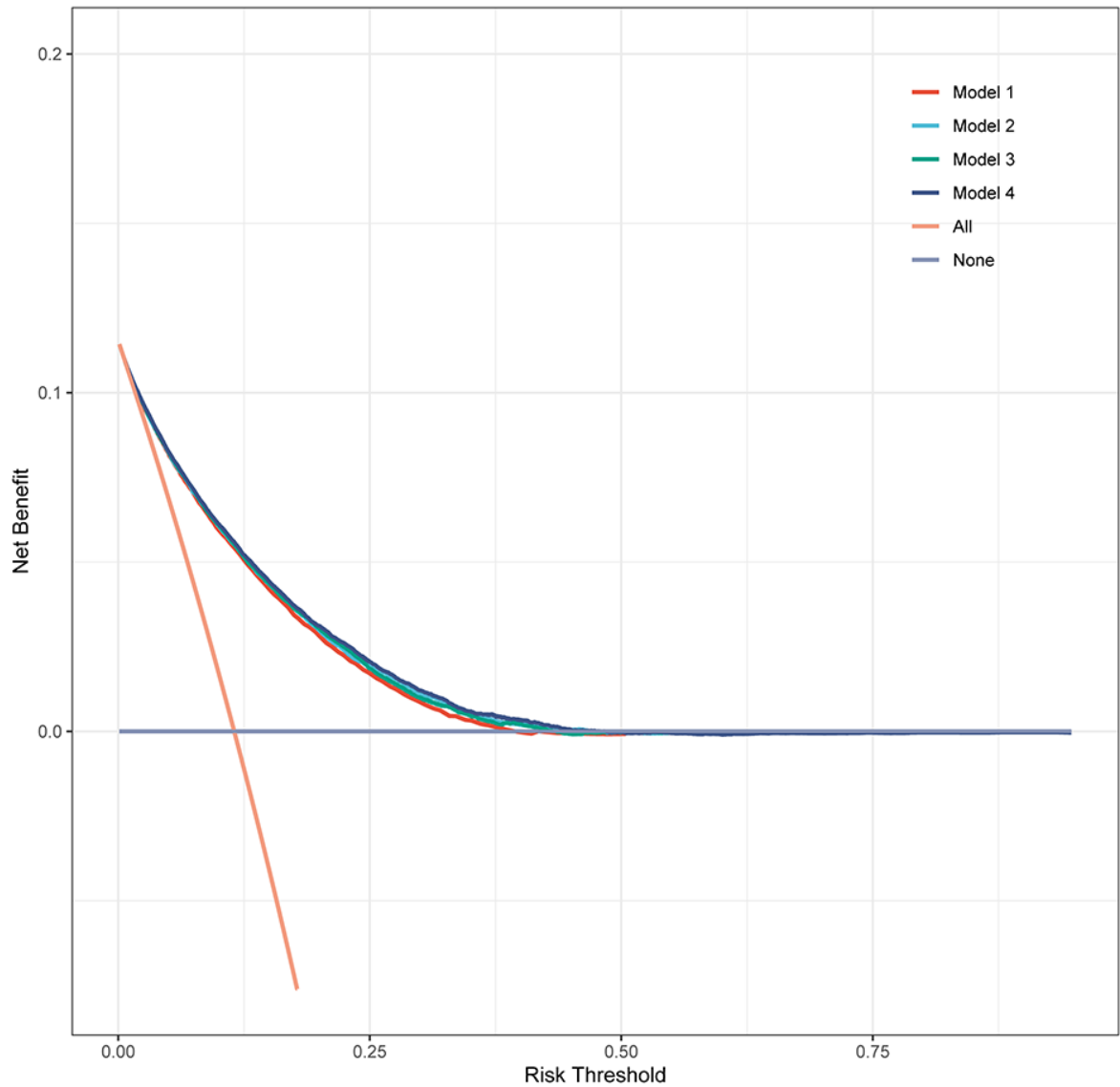
Supplementary Figure 2. Receiver operating characteristic (ROC) curves for individual biomarkers in cross-sectional discrimination of prevalent cardiovascular disease (CVD). Model 1: HDL-C alone; Model 2: HbA1c alone; Model 3: HbA1c/HDL-C ratio alone. The diagonal dashed line represents random chance.



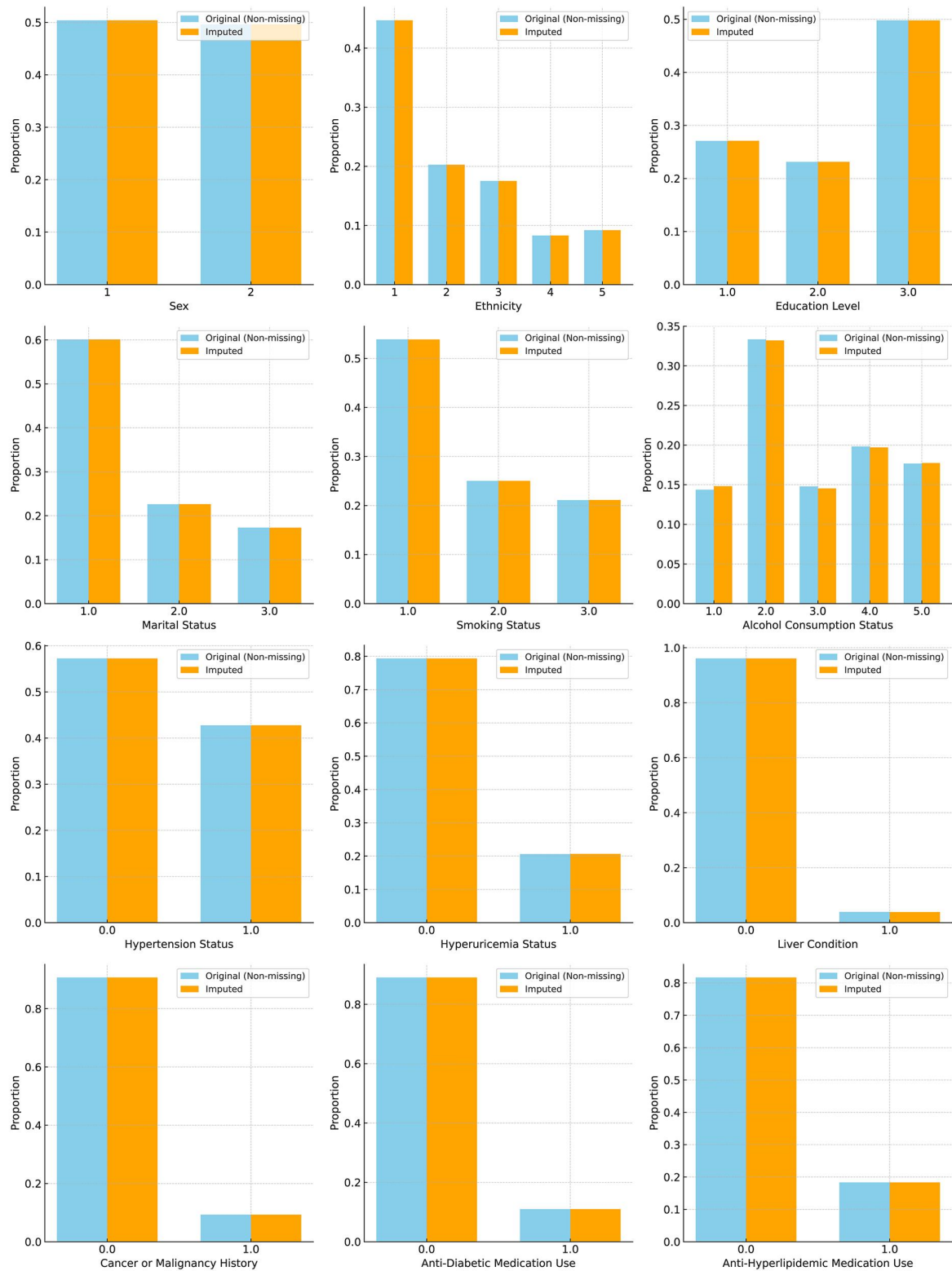
Supplementary Figure 3. Decision curve analysis (DCA) showing net benefit of individual biomarkers for cross-sectional classification of prevalent CVD across different threshold probabilities. Model 1: HDL-C alone; Model 2: HbA1c alone; Model 3: HbA1c/HDL-C ratio alone.



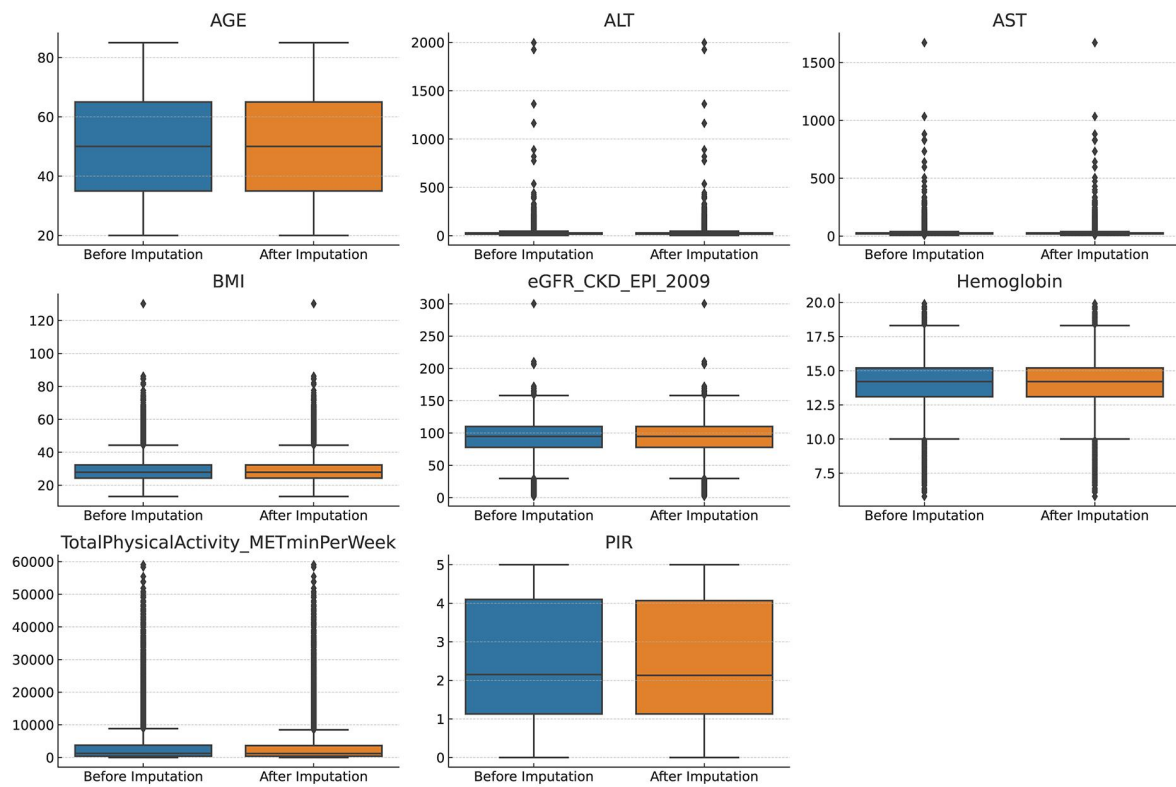
Supplementary Figure 4. Receiver operating characteristic (ROC) curves comparing the discrimination of combined models for cross-sectional classification of prevalent cardiovascular disease (CVD). All models include age and sex, with additional biomarkers as follows: Model 1, age+sex (baseline); Model 2, age+sex+HbA1c; Model 3, age+sex+HDL-C; and Model 4, age+sex+HbA1c-to-HDL-C ratio. Area under the curve (AUC) values are shown for each model.



Supplementary Figure 5. Decision curve analysis (DCA) comparing the net benefit of combined models across threshold probabilities for cross-sectional classification of prevalent CVD. All models include age and sex, with additional biomarkers as follows: Model 1, age + sex (baseline); Model 2, age + sex + HbA1c; Model 3, age + sex + HDL-C; Model 4, age + sex + HbA1c/HDL-C ratio.



Supplementary Figure 6. Comparison of categorical variable distributions before and after multiple imputation. Light blue bars represent original non-missing data proportions, orange bars represent post-imputation proportions.



Supplementary Figure 7. Distribution comparison of continuous variables before and after multiple imputation shown as box plots. Blue boxes represent pre-imputation data, orange boxes represent post-imputation data.