



**Supplementary Figure 2.** Schoenfeld residual plot for proportional hazards assumption. This plot shows the Schoenfeld residuals for CKM stage against time, evaluating the proportional hazards (PH) assumption in the Cox regression model. Although the global test for proportionality was statistically significant ( $p < 0.001$ ), likely due to the large sample size ( $> 1.4$  million), the residuals displayed no discernible pattern over time, suggesting no meaningful violation of the PH assumption. CKM, cardiovascular-kidney-metabolic.