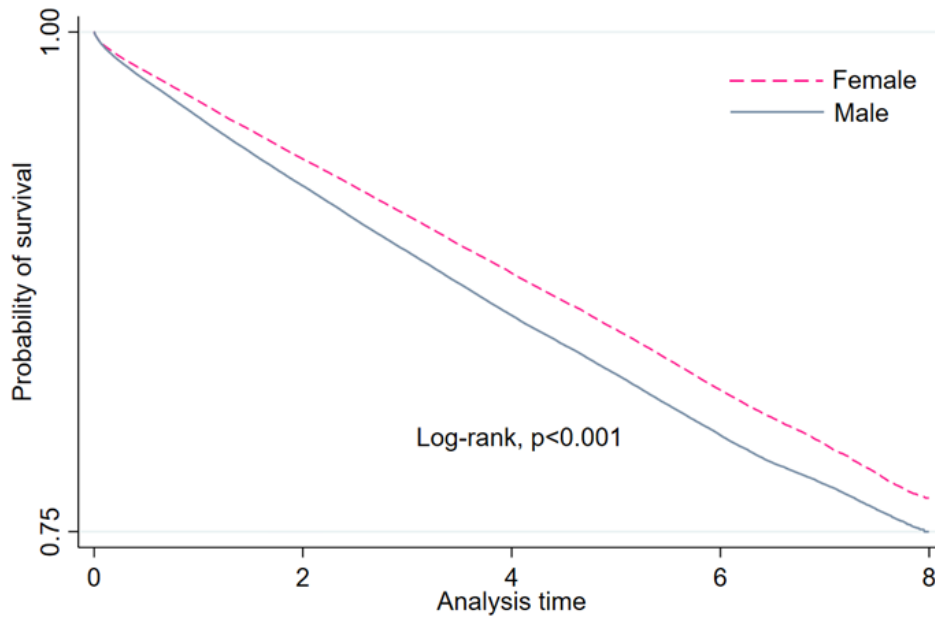


Supplementary Materials

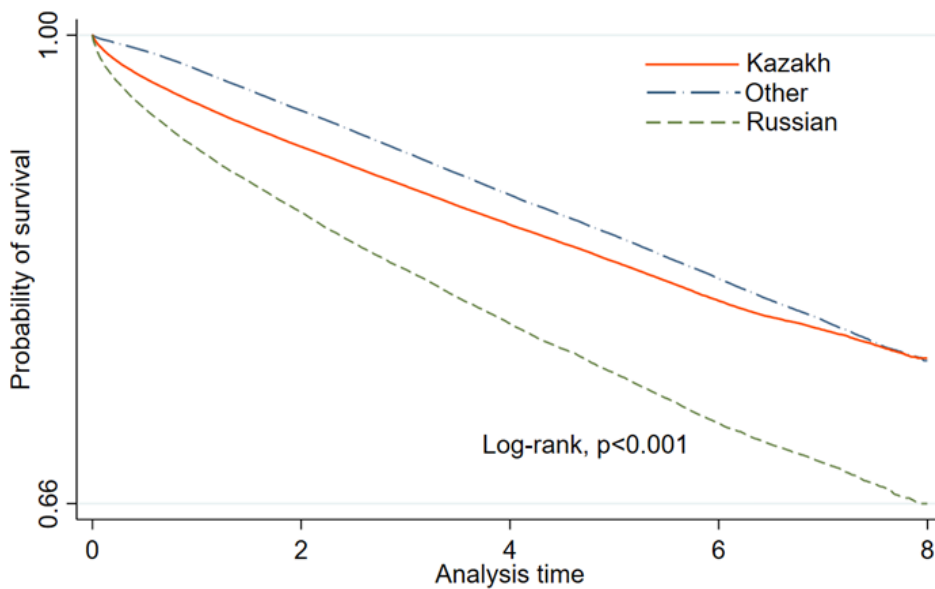
Epidemiological Characteristics and All-Cause Mortality of Chronic Coronary Disease in Kazakhstan: A Nationwide Administrative Data Analysis, 2014–2021

Supplementary Figure 1. Unadjusted Kaplan–Meier survival analysis of chronic coronary disease by (A) gender, (B) ethnicity, (C) place of residence, and (D) revascularisation type, with log-rank test p-values. CABG – coronary artery bypass grafting; PCI – percutaneous coronary intervention.

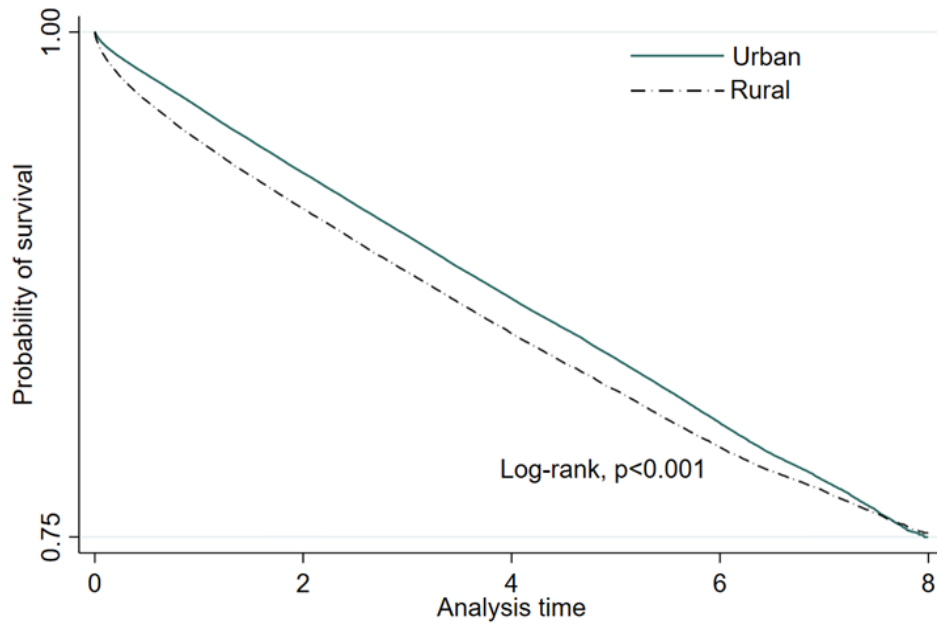
A) Gender



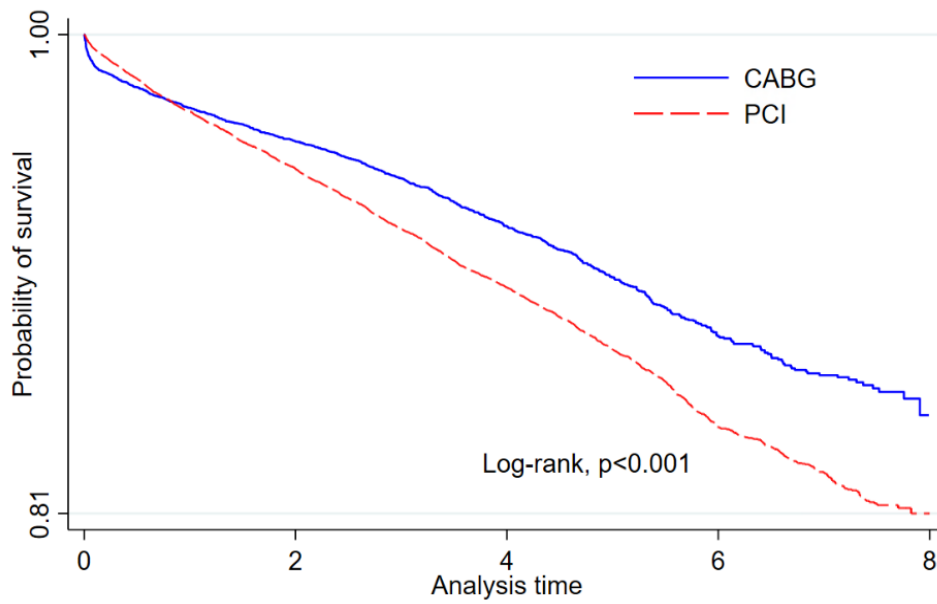
B) Ethnicity



C) Place of residence



D) Revascularisation type



Supplementary Table 1. ICD-10 codes used to identify patients with chronic coronary disease in the nationwide electronic inpatient and outpatient records.

Code	Description
I20	Angina pectoris
I20.0	Unstable angina
I20.1	Angina pectoris with documented spasm
I20.2	Refractory angina pectoris
I20.8	Other forms of angina pectoris
I20.9	Angina pectoris, unspecified

Supplementary Table 2. ICD-10 codes used to identify comorbidities and surgical interventions.

Comorbidity	ICD-10 codes
Acute myocardial infarction (AMI)	I21; I22; I25.2; I25.5
Cerebrovascular disease	G45; G46; H34.0; I60–I69
Chronic obstructive pulmonary disease (COPD)	I27.8; I27.9; J40–J47; J60–J67; J68.4; J70.1; J70.3
Diabetes mellitus (DM)	E10.0–E10.9; E11.0–E11.9; E12.0–E12.9; E13.0–E13.9; E14.0–E14.9
Hypertension	I10; I11; I12; I13
Atherosclerotic heart disease (ASHD)	I23; I24; I51.0; I51.2; Z95.1; Z95.5; Z98.61
Chronic kidney disease (CKD)	A18.11; A52.75; B52.0; D59.3; E08.2; E09.2; E10.2; E11.2; E13.2; K76.7; M10.3; M32.14; M32.15; M35.04; N00–N08; N11.0; N13–N16; N18; N19; N25–N28; N31.2; N31.9; O10.2; O10.3; O12.1; O12.2; O26.83; Q27.1; Q60–Q64; Q79.4; Q79.51; Q80.0; R94.4; T86.1; Y84.1; Z48.22; Z49; Z94.0; Z99.2
Obesity	E66; Z71.3; Z13.8; E03.9; E23.6
Surgical interventions	43.89; 44.30; 44.38; 44.39; 44.68; 44.95; 44.96; 44.97; 44.99; 45.50; 45.51; 45.90

Supplementary Table 3. ICD-10 codes used for cause-specific mortality.

Cause of death	ICD-10 codes
Acute myocardial infarction	I21.0, I21.1, I21.2, I21.3, I21.4, I21.9
Stroke	I60.0–I60.9, I61, I61.0–I61.9, I62.0, I62.1, I62.9, I63, I63.0–I63.9, I64
Peripheral vascular disease	I70, I71, I72, I73
Ischaemic heart disease	I20, I20.0, I20.1, I20.8, I20.9, I22, I23, I24, I25, I25.10, I25.11
Heart failure	I50, I50.1, I50.2, I50.3, I50.4, I50.9
Hypertension	I10, I11, I12, I13

Cause of death	ICD-10 codes
Arrhythmia	I49.8, I49.9

Supplementary Table 4. Mann–Kendall non-parametric trend test and Sen’s slope estimates for annual indicators of chronic coronary disease in Kazakhstan, 2014–2021 (n = 8 annual observations per series).

Indicator	Trend direction	Kendall’s τ	Mann–Kendall p-value	Sen’s slope (per year)	95% CI for Sen’s slope
Incidence rate (per 100,000)	Non-significant decline	−0.571	0.064	−43.9	(−68.1, +4.2)
Period prevalence (per 100,000)	Significant increase	+1.000	<0.001	+370.4	(+294.9, +422.1)
All-cause mortality rate (per 100,000)	Significant increase	+1.000	<0.001	+11.6	(+9.8, +13.3)
Case fatality (%)	No trend	−0.286	0.387	−0.031	(−0.062, +0.052)
Incident cases (absolute)	Non-significant decline	−0.500	0.108	−6,641	(−11,448, +2,007)
Prevalent cases (absolute)	Significant increase	+1.000	<0.001	+72,814	(+59,814, +80,879)
Deaths (absolute)	Significant increase	+1.000	<0.001	+2,236	(+1,921, +2,485)

The two-sided Mann–Kendall test was used to assess the presence of a monotonic temporal trend; Sen’s slope provides a non-parametric estimate of the magnitude of change per year, with 95% confidence intervals derived from the normal approximation of the variance of Kendall’s S statistic. Trends were considered statistically significant at $p < 0.05$. Calculations were performed in Python (pymannkendall package).