

Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to:

Glycaemic control, renal complications and current smoking in relation to excess risk of mortality in persons with type 1 diabetes

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2 Inpatient Registry and ICD Codes

The Inpatient Registry and cause of death registry includes mandatory information on all principal and secondary hospital discharge diagnoses, deaths, and causes of deaths. The Inpatient Registry was first used in the 1960s, with nationwide coverage beginning in 1987. Diagnoses in the Inpatient Registry are classified according to the International Classification of Diseases (ICD) system. Dates and causes of death were collected from the cause of death registry. The following ICD-10 codes from death registry were used for defining death due to ketoacidosis or hypoglycaemia and from inpatient registry for defining diagnosis of ketoacidosis and hypoglycemia: E100, E101, E110, E111, E140, E141 and E162. The corresponding ICD-9 codes are: 250A, 251A, 251B and 251C. The acute intoxication was defined by using following codes from the inpatient registry: ICD-10 F100, F110, F120, F130, F140 and F160; ICD-9 303 and 305.

3 Tables

3.1 Table S1. Unadjusted and adjusted hazard ratios for all-cause and CVD mortality and 95% confidence intervals for time-updated mean HbA1c categories and time updated normoalbuminuria examined by Cox regression

	Hazard ratio (95% CI) p-value			
	Model 1	Model 2	Model 3	Model 4
All-cause mortality				
Controls (reference)	1.00	1.00	1.00	1.00
<=6.9% (<=52 mmol/mol) - Normoalbuminuria	1.24 (1.00 - 1.55) 0.049	1.32 (1.09 - 1.61) 0.0047	1.31 (1.08 - 1.59) 0.0067	1.35 (1.11 - 1.64) 0.0027
7.0-7.8% (53-62 mmol/mol) - Normoalbuminuria	1.55 (1.33 - 1.80) <.0001	1.49 (1.31 - 1.71) <.0001	1.50 (1.31 - 1.71) <.0001	1.46 (1.28 - 1.68) <.0001
7.9-8.7% (63-72 mmol/mol) - Normoalbuminuria	1.99 (1.72 - 2.32) <.0001	1.86 (1.63 - 2.11) <.0001	1.88 (1.65 - 2.14) <.0001	1.77 (1.55 - 2.02) <.0001
8.8-9.6% 73-82 (mmol/mol) - Normoalbuminuria	2.32 (1.85 - 2.91) <.0001	2.49 (2.06 - 3.00) <.0001	2.51 (2.08 - 3.03) <.0001	2.29 (1.89 - 2.77) <.0001
>=9.7% (>=83 mmol/mol) - Normoalbuminuria	5.57 (3.93 - 7.89) <.0001	5.89 (4.65 - 7.47) <.0001	5.77 (4.55 - 7.31) <.0001	5.17 (4.08 - 6.55) <.0001
<=6.9% (<=52 mmol/mol) - Not Normoalbuminuria	5.15 (3.96 - 6.71) <.0001	4.80 (4.00 - 5.76) <.0001	4.80 (3.99 - 5.76) <.0001	4.30 (3.58 - 5.17) <.0001
7.0-7.8% (53-62 mmol/mol) - Not Normoalbuminuria	4.86 (4.10 - 5.76) <.0001	4.41 (3.91 - 4.97) <.0001	4.41 (3.91 - 4.98) <.0001	3.74 (3.31 - 4.23) <.0001
7.9-8.7% (63-72 mmol/mol) - Not Normoalbuminuria	5.95 (5.12 - 6.92) <.0001	5.40 (4.87 - 5.99) <.0001	5.47 (4.93 - 6.07) <.0001	4.80 (4.32 - 5.33) <.0001
8.8-9.6% 73-82 (mmol/mol) - Not Normoalbuminuria	5.66 (4.64 - 6.90) <.0001	5.79 (5.05 - 6.63) <.0001	5.92 (5.16 - 6.78) <.0001	5.04 (4.39 - 5.79) <.0001
>=9.7% (>=83 mmol/mol) - Not Normoalbuminuria	15.07 (11.21 - 20.26) <.0001	13.20 (11.38 - 15.31) <.0001	13.57 (11.70 - 15.75) <.0001	10.65 (9.16 - 12.39) <.0001
CVD mortality				
Controls (reference)	1.00	1.00	1.00	1.00
<=6.9% (<=52 mmol/mol) - Normoalbuminuria	1.10 (0.72 - 1.68) 0.65	1.16 (0.79 - 1.70) 0.44	1.17 (0.80 - 1.71) 0.43	1.21 (0.82 - 1.77) 0.34
7.0-7.8% (53-62 mmol/mol) - Normoalbuminuria	2.23 (1.72 - 2.89) <.0001	2.02 (1.63 - 2.51) <.0001	2.03 (1.63 - 2.52) <.0001	1.89 (1.52 - 2.35) <.0001
7.9-8.7% (63-72 mmol/mol) - Normoalbuminuria	2.49 (1.88 - 3.29) <.0001	2.11 (1.68 - 2.66) <.0001	2.13 (1.69 - 2.68) <.0001	1.90 (1.51 - 2.39) <.0001
8.8-9.6% 73-82 (mmol/mol) - Normoalbuminuria	2.55 (1.67 - 3.89) <.0001	2.90 (2.05 - 4.09) <.0001	2.92 (2.06 - 4.12) <.0001	2.41 (1.70 - 3.40) <.0001
>=9.7% (>=83 mmol/mol) - Normoalbuminuria	5.88 (2.91 - 11.88) <.0001	6.12 (3.84 - 9.75) <.0001	6.15 (3.86 - 9.81) <.0001	5.07 (3.18 - 8.08) <.0001
<=6.9% (<=52 mmol/mol) - Not Normoalbuminuria	5.59 (3.57 - 8.75) <.0001	5.25 (3.88 - 7.12) <.0001	5.24 (3.87 - 7.10) <.0001	4.20 (3.10 - 5.70) <.0001
7.0-7.8% (53-62 mmol/mol) - Not Normoalbuminuria	5.37 (4.05 - 7.12) <.0001	5.15 (4.23 - 6.28) <.0001	5.12 (4.20 - 6.25) <.0001	4.02 (3.29 - 4.92) <.0001
7.9-8.7% (63-72 mmol/mol) - Not Normoalbuminuria	7.15 (5.54 - 9.22) <.0001	6.90 (5.84 - 8.16) <.0001	6.90 (5.84 - 8.16) <.0001	5.57 (4.70 - 6.61) <.0001
8.8-9.6% 73-82 (mmol/mol) - Not Normoalbuminuria	6.99 (4.94 - 9.91) <.0001	7.50 (5.98 - 9.39) <.0001	7.56 (6.03 - 9.47) <.0001	5.86 (4.67 - 7.37) <.0001
>=9.7% (>=83 mmol/mol) - Not Normoalbuminuria	18.73 (10.41 - 33.70) <.0001	14.89 (11.37 - 19.51) <.0001	14.98 (11.43 - 19.64) <.0001	9.90 (7.50 - 13.06) <.0001
Model 1 (98.5% individuals with non-missing data): unadjusted model, matched for age and sex Model 2 (98.5% individuals with non-missing data): adjusted for time-updated age and sex Model 3 (98.5% individuals with non-missing data): additionally stratified for diabetes duration at baseline Model 4 (97.4% individuals with non-missing data): additionally adjusted for born in Sweden, maximum education level and baseline comorbidities.				

3.2 Table S2. Unadjusted and adjusted hazard ratios for all-cause and CVD mortality and 95% confidence intervals for time-updated mean HbA1c categories and time updated eGFR examined by Cox regression

	Hazard ratio (95% CI) p-value			
	Model 1	Model 2	Model 3	Model 4
All-cause mortality				
Controls (reference)	1.00	1.00	1.00	1.00
<=6.9% (<=52 mmol/mol) - eGFR>=60	1.41 (1.15 - 1.72) 0.0008	1.47 (1.23 - 1.76) <.0001	1.46 (1.22 - 1.74) <.0001	1.50 (1.26 - 1.80) <.0001
7.0-7.8% (53-62 mmol/mol) - eGFR>=60	1.73 (1.50 - 1.98) <.0001	1.63 (1.44 - 1.84) <.0001	1.64 (1.45 - 1.85) <.0001	1.57 (1.39 - 1.78) <.0001
7.9-8.7% (63-72 mmol/mol) - eGFR>=60	2.37 (2.09 - 2.69) <.0001	2.20 (1.97 - 2.44) <.0001	2.22 (2.00 - 2.48) <.0001	2.12 (1.90 - 2.36) <.0001
8.8-9.6% 73-82 (mmol/mol) - eGFR>=60	2.43 (2.02 - 2.93) <.0001	2.61 (2.24 - 3.05) <.0001	2.65 (2.27 - 3.09) <.0001	2.45 (2.10 - 2.86) <.0001
>=9.7% (>=83 mmol/mol) - eGFR>=60	7.75 (5.88 - 10.22) <.0001	7.23 (6.07 - 8.60) <.0001	7.16 (6.01 - 8.53) <.0001	6.27 (5.26 - 7.47) <.0001
<=6.9% (<=52 mmol/mol) - eGFR<60	5.68 (4.24 - 7.61) <.0001	5.19 (4.26 - 6.31) <.0001	5.16 (4.24 - 6.28) <.0001	4.41 (3.62 - 5.38) <.0001
7.0-7.8% (53-62 mmol/mol) - eGFR<60	5.47 (4.52 - 6.62) <.0001	5.24 (4.59 - 5.97) <.0001	5.21 (4.57 - 5.95) <.0001	4.33 (3.78 - 4.95) <.0001
7.9-8.7% (63-72 mmol/mol) - eGFR<60	7.48 (6.20 - 9.02) <.0001	6.47 (5.74 - 7.29) <.0001	6.50 (5.76 - 7.32) <.0001	5.37 (4.76 - 6.07) <.0001
8.8-9.6% 73-82 (mmol/mol) - eGFR<60	8.60 (6.62 - 11.18) <.0001	8.45 (7.21 - 9.90) <.0001	8.60 (7.33 - 10.07) <.0001	6.69 (5.70 - 7.86) <.0001
>=9.7% (>=83 mmol/mol) - eGFR<60	15.35 (10.77 - 21.89) <.0001	15.76 (13.24 - 18.74) <.0001	16.20 (13.61 - 19.28) <.0001	12.71 (10.65 - 15.16) <.0001
CVD mortality				
Controls (reference)	1.00	1.00	1.00	1.00
<=6.9% (<=52 mmol/mol) - eGFR>=60	1.26 (0.86 - 1.86) 0.24	1.30 (0.92 - 1.83) 0.14	1.31 (0.93 - 1.85) 0.13	1.33 (0.94 - 1.88) 0.11
7.0-7.8% (53-62 mmol/mol) - eGFR>=60	2.25 (1.76 - 2.87) <.0001	1.95 (1.59 - 2.39) <.0001	1.96 (1.59 - 2.40) <.0001	1.80 (1.46 - 2.21) <.0001
7.9-8.7% (63-72 mmol/mol) - eGFR>=60	3.22 (2.56 - 4.04) <.0001	2.79 (2.32 - 3.34) <.0001	2.80 (2.34 - 3.36) <.0001	2.52 (2.10 - 3.03) <.0001
8.8-9.6% 73-82 (mmol/mol) - eGFR>=60	3.02 (2.16 - 4.23) <.0001	3.28 (2.51 - 4.29) <.0001	3.32 (2.54 - 4.33) <.0001	2.83 (2.16 - 3.70) <.0001
>=9.7% (>=83 mmol/mol) - eGFR>=60	10.64 (5.78 - 19.61) <.0001	7.47 (5.28 - 10.56) <.0001	7.50 (5.30 - 10.60) <.0001	5.74 (4.06 - 8.13) <.0001
<=6.9% (<=52 mmol/mol) - eGFR<60	6.03 (3.75 - 9.70) <.0001	6.02 (4.39 - 8.24) <.0001	5.98 (4.37 - 8.20) <.0001	4.71 (3.43 - 6.47) <.0001
7.0-7.8% (53-62 mmol/mol) - eGFR<60	6.23 (4.60 - 8.45) <.0001	6.70 (5.46 - 8.21) <.0001	6.68 (5.45 - 8.19) <.0001	5.08 (4.13 - 6.26) <.0001
7.9-8.7% (63-72 mmol/mol) - eGFR<60	7.93 (5.79 - 10.85) <.0001	7.57 (6.22 - 9.22) <.0001	7.59 (6.24 - 9.24) <.0001	5.78 (4.73 - 7.06) <.0001
8.8-9.6% 73-82 (mmol/mol) - eGFR<60	9.72 (6.19 - 15.28) <.0001	10.66 (8.20 - 13.87) <.0001	10.70 (8.22 - 13.92) <.0001	7.34 (5.62 - 9.60) <.0001
>=9.7% (>=83 mmol/mol) - eGFR<60	13.80 (7.52 - 25.31) <.0001	17.31 (12.73 - 23.53) <.0001	17.50 (12.87 - 23.81) <.0001	12.11 (8.84 - 16.59) <.0001
Model 1 (98.9% individuals with non-missing data): unadjusted model, matched for age and sex Model 2 (98.9% individuals with non-missing data): adjusted for time-updated age and sex Model 3 (98.9% individuals with non-missing data): additionally stratified for diabetes duration at baseline Model 4 (97.8% individuals with non-missing data): additionally adjusted for born in Sweden, maximum education level and baseline comorbidities.				